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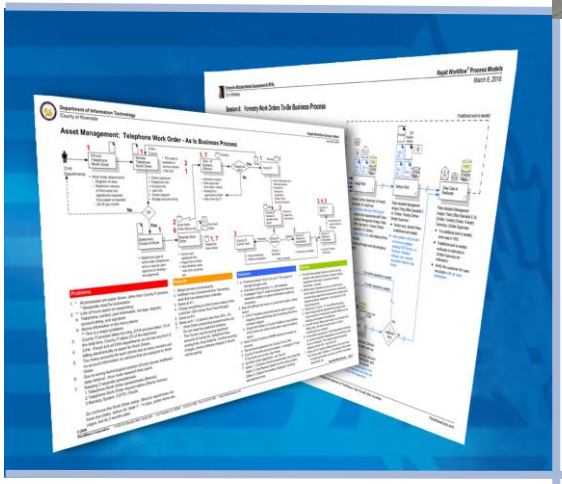

City of FRESNO

Information Technology Strategic Plan

City of Fresno

Task 3.1.1: IT Strategic Plan

October 23, 2023

35 YEARS

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ThirdWave

ThirdWave Corporation
Information Systems Intelligently Applied
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IT Strategic Plan: Volume 1 - Findings & Recommendations (v18)

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Preface

The City of Fresno Information Technology Strategic Plan & Implementation Roadmap (ITSP Roadmap) is the result of a comprehensive and thorough assessment of the City's existing technologies, operational requirements and service delivery needs. This document reflects a strategy that is technologically strategic, operationally responsive, and fiscally responsible. It addresses the unique requirements of mission-critical business needs of Fresno constituents, business community and visitors.

The ITSP Roadmap is the product of a collaborative effort with City management and staff who made valuable contributions throughout the project. A focus was placed on addressing management, operational and technology challenges that could be mitigated with strategic investments in proven and emerging technologies. ThirdWave observed numerous strengths at the City including the following:

- Under the direction of the City Manager and the leadership of the CIO, the execution of the 5-year IT Strategic Plan is a healthy indicator of the desire to intelligently plan the City's future use of emerging technologies.
- City staff have a strong level of professionalism, with a conscientious commitment to delivering exemplary services to the residents, businesses and tourists of Fresno.
- With regards to technology, the leadership team is most concerned with promoting a digital workforce and workplace, cyber security, and Geographic Information Systems.

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- The level of engagement on the Staff Online Survey (207 staff), was one of the highest ThirdWave has received over 35 years doing IT Strategic Plans for over 200 cities. City staff provided significant amounts of feedback and valuable insights into end-user requirements.
- The City's leadership team, several who are new to the City, is highly committed to the fullest use of automation in order to provide the residents of Fresno extraordinary services. Department heads were active participants in the ITSP project.
- The City's CIO has done an exceptional job implementing a substantial number of city-wide Information Technologies over recent years, which continues today. The recent centralization of the Information Services Department, an ambitious effort, is being carried out successfully. The City's IT posture is one of the best in the State of California.

The ITSP Roadmap focuses on improving the status quo and articulating a path for the City's continuing evolution as an exceptional City; it is comprised of two complementary volumes:

Volume 1: ***IT Strategic Plan (ITSP),*** providing functional and technical specifications and benefits for a comprehensive set of possible management, business process improvement, and Information Technology initiatives (this document);

Volume 2: ***IT Strategic Plan 5-Year Implementation Roadmap (Roadmap),*** providing the final proposed and prioritized Information Technology initiatives, budget estimates, 5-year timeline, and city-wide and community benefits of adopting and funding the ITSP Roadmap.

The challenge of adopting, funding and implementing an ITSP Roadmap is a formidable one. However, given its 5-year timeline, there is plenty of latitude to execute the technology initiatives identified in the ITSP. The ITSP Roadmap is a living document that should be reviewed and adjusted on a yearly basis. It provides opportunities for new, more efficient ways of providing services. The purpose of the ITSP Roadmap is to ensure investments in strategic business technologies are sound and deliver the highest possible value to the City and its constituents. This document provides a wealth of data that can be leveraged over the next five years to facilitate excellence in municipal services, civic participation, and community well-being.

A special thanks to the CIO, Bryon Horn and Frank D. Vawter, ISD Assistant Director, Department Heads and the City's professional staff for their engagement and valuable input. This project could not have been realized without the close collaboration of city staff and management.

Respectfully,

Roy R. Hernández
Founder, President & CEO
ThirdWave Corporation

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Section 1
Executive Summary

1.1 Information Technology Strategic Plan Vision

This document provides an Information Technology Strategic Plan (ITSP) Roadmap custom tailored to the City of Fresno.

Informed by the unique organizational and operational needs of the City, the ITSP offers a technologically sound vision focusing on Strategic Business Technologies responsive to the challenges and opportunities that exist at the City.

The vision of the ITSP Roadmap is to:

> *Provide a comprehensive roadmap fostering the use of proven state-of-the-practice Information Technology in the most strategic, innovative, cost effective and efficient manner possible to support internal City operations, extraordinary customer service delivery, civic participation and community wellbeing.*

The adoption and implementation of the ITSP Roadmap will leverage the effective investment in Information Technologies, while at the same time support the City's mission-critical services.

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1.2 Project Goal & Objectives

The goal of the project was to create an exceedingly responsive five (5) year ITSP Roadmap employing a highly participatory process engaging City staff, management, and IT department. The objectives are to:

- Connect technology resources, innovation, and initiatives to the City's core values and mission-critical services;
- Serve as an effective framework for how IT services are delivered throughout the City; and
- Define a clear set of goals, guiding principles, and strategic priorities for accomplishing the City's ITSP, principles and implementation roadmap.

The ITSP Roadmap represents the results of a comprehensive City-wide assessment of the City's IT needs. It provides a high-level technical specification fifty-six (56) Information Technology initiatives, including a compelling business case for each. Consequently, this is a sizable document.

This document is structured to provide sufficient details for each actionable recommendation, to the extent that the content could be used to develop Request for Proposal/solicitation documents over the next five years. **In other words, this is a technical reference volume, not a document meant to be read in one sitting.**

The ITSP document contains articulated objectives that will guide how the City delivers innovative and effective services internally and to the public.

1.3 Project Approach & Methodology

The ITSP project employed a comprehensive and structured best-practice methodology. It applied ThirdWave's patented data-driven method, which collects and synthesizes various types of information, including:

- Data on existing and planned Information Technology
- Focus Groups with IT staff and management
- Interviews with the City's leadership team
- Online Staff Survey, to allow all City staff the opportunity to provide input
- Seventeen (17) half-day Rapid Workflow® business process improvement workshops addressing mission-critical business functions

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1.4 City of Fresno Background Information

Fresno is a major city in the San Joaquin Valley of California, United States. It is the county seat of Fresno County and the largest city in the greater Central Valley region. It covers about 115 square miles and had a population of 542,107 as of the 2020 Census, making it the fifth-most populous city in California.

Named for the abundant ash trees lining the San Joaquin River, Fresno was founded in 1872 as a railway station of the Central Pacific Railroad before it was incorporated in 1885.

It has since become an economic hub of Fresno County and the San Joaquin Valley, with much of the surrounding areas in the Metropolitan Fresno region predominantly tied to large-scale agricultural production. Fresno is approximately 220 miles north of Los Angeles. Yosemite National Park is about 60 miles to the north. Fresno is also the third-largest majority-Hispanic city in the United States, 50.5% of its population being Hispanic in 2020.

1.5 Information Technology Strategic Plan (ITSP) Findings

1.5.1 Summary of Key Findings

The ITSP project identified approximately sixty-six (66) strategic initiatives spanning management, operational and technology areas of opportunity. Many of these represent solutions widely affecting customer service, are foundational to adopt emerging technologies, or provide staff the fundamental tools they need to perform their operational/service delivery responsibilities.

The following provides a summary of the top ten (10) challenges and recommendations facing the City. (All initiatives are described in detail in Section 4, ITSP Recommendations in this document. Technical terms are defined in a glossary in Section 5 of this document.)

1. ISD Organization Model

The City of Fresno is undergoing a centralization process of IT functions, whereby City IT professionals were placed under the ISD organization. This process has produced economies of scale in resources allocation and ISD service delivery, but has also highlighted technical skillset and resource deficiencies in a number of areas. More specifically, the management interviews, ISD Focus Groups and Business Process workshops identified significant technical support needs. ISD executives are currently acting project managers on IT projects, which is not what their role should be. This untenable situation will be magnified with the execution of 50+ ITSP projects in addition to ongoing IT projects.

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2. Construction Management

The Public Works Engineering and Construction Management Divisions (the latter is responsible for approximately 100 open projects at time, with a value of $200 - $240 million dollars), face a number of estimating, tracking, budgeting, document and construction management challenges. Staff lack the software and mobile devices required to support this scale of construction activity. This results in wasted staff time, potential for mistakes, reliance on spreadsheets, difficult document management, and inaccessible information from the field.

3. Cyber Security

Cyber security was one of the top three technology concerns identified by the City's leadership team. The focus groups with ISD staff revealed the City follows NIST but has not made this a standard.

4. Radio System

The ITSP project revealed the Police and Transportation FAX Land mobile radio system is analog and antiquated. Most equipment is at end of life, the City desires to move to a digital solution. ISD is currently evaluating the current system for improvement and expect the replacement of the entire system to be around $35m. (This was a pre-pandemic number, and should revisited based on inflation and the addition of the new crown castle site.)

5. IT Governance

The lack of an IT Governance, a formal requirement, vetting, evaluation and selection process to introduce technology into the City, was one of the most mentioned challenges in the ITSP project. It was raised in the Management Interviews, IT Focus Groups and IT Governance workshop. This results in security exposures, software implemented ISD is not aware of and may not be able to support, and systems that do not conform to the City's system standards or Enterprise Architecture.

6. Customer Relationship Management

The business process workshops with Economic Development identified a lack of software to promote the economic progress of the Fresno community. This results in manually gathering and managing economic data in Excel spreadsheets, duplicate data in redundant systems, wasted staff time, stress, data deleted by mistake, undefined methodologies and processes, and poor document management.

7. Disaster Recovery Site

The IT Focus Groups with ISD revealed a number of challenges related to the City's disaster recovery posture from a facility standpoint (versus policy and practice). Existing facilities have cooling, power and equipment space issues that need to be resolved. Racks are practically full. This results in single points of failure, limits systems deployed because of environmental constraints, inability to support redundancy of critical services, and equipment unreliability.

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8. Grants Management Software

The Management Interview with Finance revealed the lack of grants management software. The City intends to use the Tyler Grants Management module. Based on the implementation challenges of the Munis system in some departments (due in part to COVID), lessons learned from that deployment should be considered.

9. Lease Management Software

The Rapid Workflow® business process workshop with General Services Department revealed the lack of a contemporary Lease Management software for City owned and leased buildings.

10. Disaster Recovery / Business Continuity Plan

The IT Focus Group with ISD staff revealed the City has a Disaster Recovery plan but it needs to be updated -- or a new one developed. The City has a Continuity of Operations Plan (COOP), and it has not been updated, tested or trained on. This may result in impacting ISD's response in resumption of systems and services.

1.5.2 Summary of Key Recommendations

The ITSP Roadmap project identified dozens of potential initiatives to the top 10 challenges noted above. The following are the most significant, and specific, actionable recommendations for the benefit they will deliver the city or the community of Fresno. The items below provide a summary of the top ten organizational and technical recommendations for the ITSP Roadmap.

The ITSP Roadmap project identified dozens of potential initiatives to the top 10 challenges noted above. The following are the most significant, and specific, actionable recommendations for the benefit they will deliver the city or the community of Fresno. The items below provide a summary of the top ten organizational and technical recommendations for the ITSP Roadmap.

1. ISD Organization Model

Resource the ISD organization with sufficient staff resources to effectively support existing and new Information Technologies: infrastructure (network communications), cyber security, application software for mission critical/public safety operations (e.g., Police, Transportation, and Airports), and new software to support the various departmental needs. Establish a Project Management Office, with staff training on project management best practices. Recruitment should offer the most competitive compensation packages possible, to strengthen the City's competitive position with the private sector.

2. Construction Estimating & Management Software

Carry out a formal requirements definition of the construction estimating and management future state process with business process owners, develop functional/technical requirements, performance specifications, and formal procurement process. This application should be leveraged to any other City department that performs estimating. This will provide several benefits including: more complete and detailed construction cost estimates, ability to leverage construction cost data from previous projects, and staff savings.

3. Cyber Security

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Continue to work on the City's Cybersecurity posture to improve its maturity including the affirmation of a framework. Such things would include refining of policies and procedures as well as creating a data management plan/policy.

4. Radio System

Re-evaluate the City's radio systems, make improvements within the system to improve on existing weaknesses while evaluating the next steps. Next steps will include finalizing the City's stance on converting to a digital system, developing requirements, scope of work, and estimated budget and implementation plan, as this will be a major technology initiative. This project will include operating existing systems while implementing the proposed systems. The new infrastructure will support several departments ensuring the effective communications for normal city operation, disaster preparedness and response.

5. IT Governance

Adopt a formal IT Governance best practice process including department requirement's definition, ISD validation, specifications and business case for management review. Adopt well-defined roles of all stakeholders' departments, ISD, and IT Governance Steering committee. This will result in several benefits, including: IT requirements responsive to the unique needs of each department and the community, ability to plan for required staff resources for successful IT implementations, best value investments in IT, and enhanced city services.

6. Customer Relationship Management Software

Carry out a formal requirements definition of the Economic Development future state process with business process owners, develop functional/technical requirements, performance specifications, and formal procurement process. Anticipated benefits include enhanced economic development, increased capacity to handle additional projects, improved efficiencies, improved customer experience, reduced staff stress, enhanced data analytics and reporting.

7. Disaster Recovery Site

Implement a fully capable Disaster Recovery site with the following minimum requirements: Inter-Pod Network (IPN POD) site with sufficient security, space, power, and cooling, 24x7 ISD access, diverse, redundant fiber connection, data replication, and immutable backups in the cloud or co-location. (A point of delivery, or PoD, is a module of network, compute, storage, and application components that work together to deliver networking services.)

8. Grants Management Software

Carry out a formal requirements definition of the Grants Management future state process with business process owners, develop functional/technical requirements, performance specifications, and formal procurement process. Anticipated benefits include streamlined business processes, enhance grant applications, rigorous grant management (expenditure tracking and reporting), and reduced audit findings.

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9. Lease Management Software

Carry out a formal requirements definition of the Lease Management future state process with business process owners, develop functional/technical requirements, performance specifications, and formal procurement process. Anticipated benefits include enhanced revenue generation, improved efficiency, enhanced tenant perception and satisfaction, improved customer experience, easy access to information, internally, allow staff to be proactive instead of reactive, information in one system will foster better planning, allow City to better leverage available properties, and provide ability to offer potential tenants leasing opportunities/options.

10. Disaster Recovery / Business Continuity Plan

Update and/or develop, adopt, and test the DR/BC Plan, including policies, processes and procedures to recover and ensure business continuity in the event of a disaster. Include planning for the resumption of applications, data, hardware, and communications/networks, addressing three key control measures: Preventive measures: controls aimed at preventing an event from occurring; Detective measures: controls aimed at detecting or discovering unwanted events; Corrective measures: controls aimed at correcting/restoring systems after a disaster. Benefit of a DR/BC Plan are avoiding downtime, prompt recovery from disasters, enhanced business resumption, improved business operational efficiencies.

1.5.3 IT Strategic Plan & Roadmap Benefits

The ITSP project identified substantial potential benefits that could be realized by implementing the strategy. Qualitative and quantitative benefits were identified in the Rapid Workflow® workshops, and were leveraged to prioritize ITSP initiatives. A total of fifty-one (51) potential benefits were identified with a total of four hundred fifty-seven (457) benefits. The first twenty-three (23) are shown in the table below, with an average of 25 benefit opportunities per mission-critical business process assessed in the project.

Figure 1.5.3.1: ITSP Potential Benefits, lists the top twenty-one potential benefits of approving and funding the ITSP.

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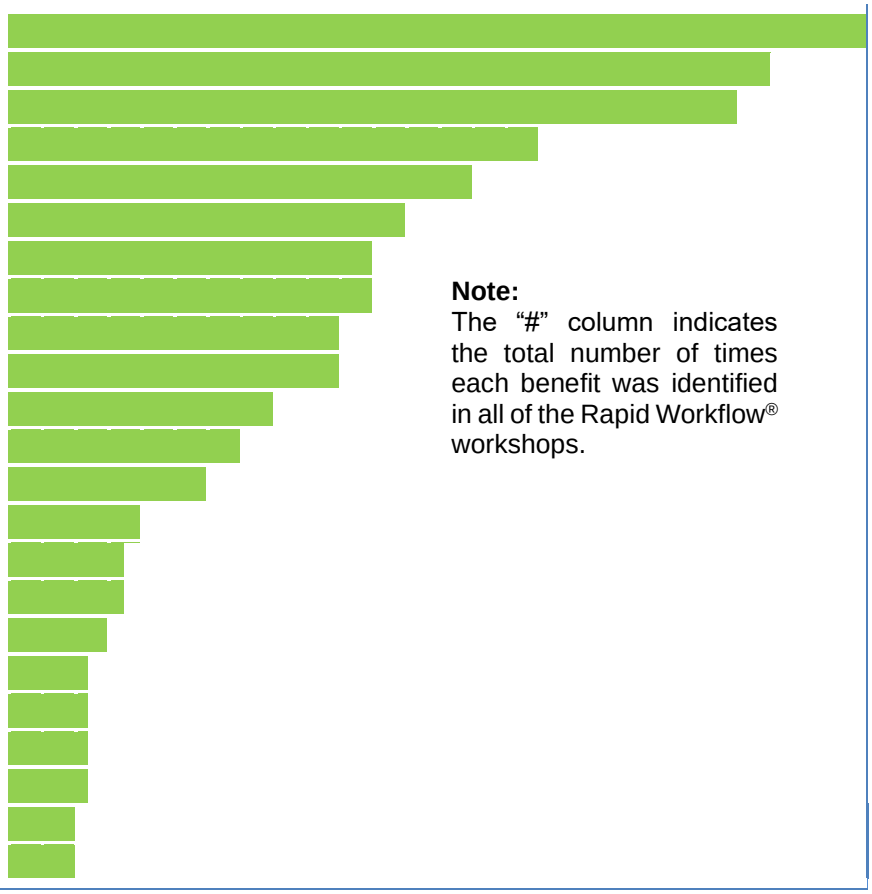
Figure 1.5.3.1: ITSP Potential Benefits

Benefits Types	#
Better customer service	61
Improve efficiency	46
Reduce staff stress	44
Staff time savings	32
Better information management	27
Improve productivity	23
Reduce staff and public frustration	21
Enhance project delivery	21
Improve staff morale	19
Business process improvement	19
Improve records management	16
Improve safety	14
Improve document management	12
Better organization	8
Improve accountability	7
Work life balance	7
More trust in the system	6
Enhance budgeting	5
Help secure funding	5
Improve funding	5
Physical space savings	5
Better reporting	4
Improve staff training	4



Note:
The "#" column indicates the total number of times each benefit was identified in all of the Rapid Workflow® workshops.

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Section 2
Project Overview

2.1 Project Background, Goal & Objectives

The goal of the ITSP project is to identify internal and external technology needs; the role of Information Technology within the IT organization; and responsive technology solutions that will allow the City to provide exemplary services to the Fresno community. Moreover, the ITSP Roadmap will help guide the City in responsive technology planning and sound investments.

The objective of the ITSP project is to provide a 5-year ITSP Roadmap employing a highly participatory process directly engaging City departments and staff. The ITSP Roadmap contains actionable recommendations that will guide and shape how the City delivers innovative and effective technology services throughout the organization and to the community at large.

This report is accompanied by a second volume, ***Volume II: Roadmap*** focusing on prioritization, budgeting and deployment timeline. As such, the following pages address "what" should be done, and the Roadmap addresses "when" and at "what cost."

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The objectives of the ITSP project are to:

- Define a clear set of goals, guiding principles and strategic priorities for accomplishing the City's objectives defining best practices and actionable recommendations.
- Serve as the framework for how IT services will be delivered to the City with an enterprise focus (instead of in a siloed manner) to integrate existing and new systems to provide business process improvement.
- Provide actionable recommendations and be the guiding document that shapes how the City delivers innovative, unified and effective technology services throughout the organization and to the community.

To this end, the implementation of future business systems and Information Technology projects must be properly prioritized, scheduled and coordinated as part of an enterprise ITSP. Implementation of the ITSP Roadmap will help ensure the City's technological and process change advancement by making logical and sound investments in physical resources (i.e., hardware, software, integrated systems, etc.) and human resources (staff and training).

2.2 IT Strategic Plan Project Approach

The ITSP project employed a comprehensive, logical and structured approach relying on the collection, assessment and synthesis of various types of information gathered in the course of the project, including:

- Information Technology inventory data
- Management interview data
- City staff and Community online survey data
- IT focus group data
- Rapid Workflow® Business Process Workshop data

Figure 2.2.1 on the following page illustrates the approach used on the ITSP project. The project was broken out into three phases: Discovery, Analysis/Requirements, and Recommendations/Strategy.

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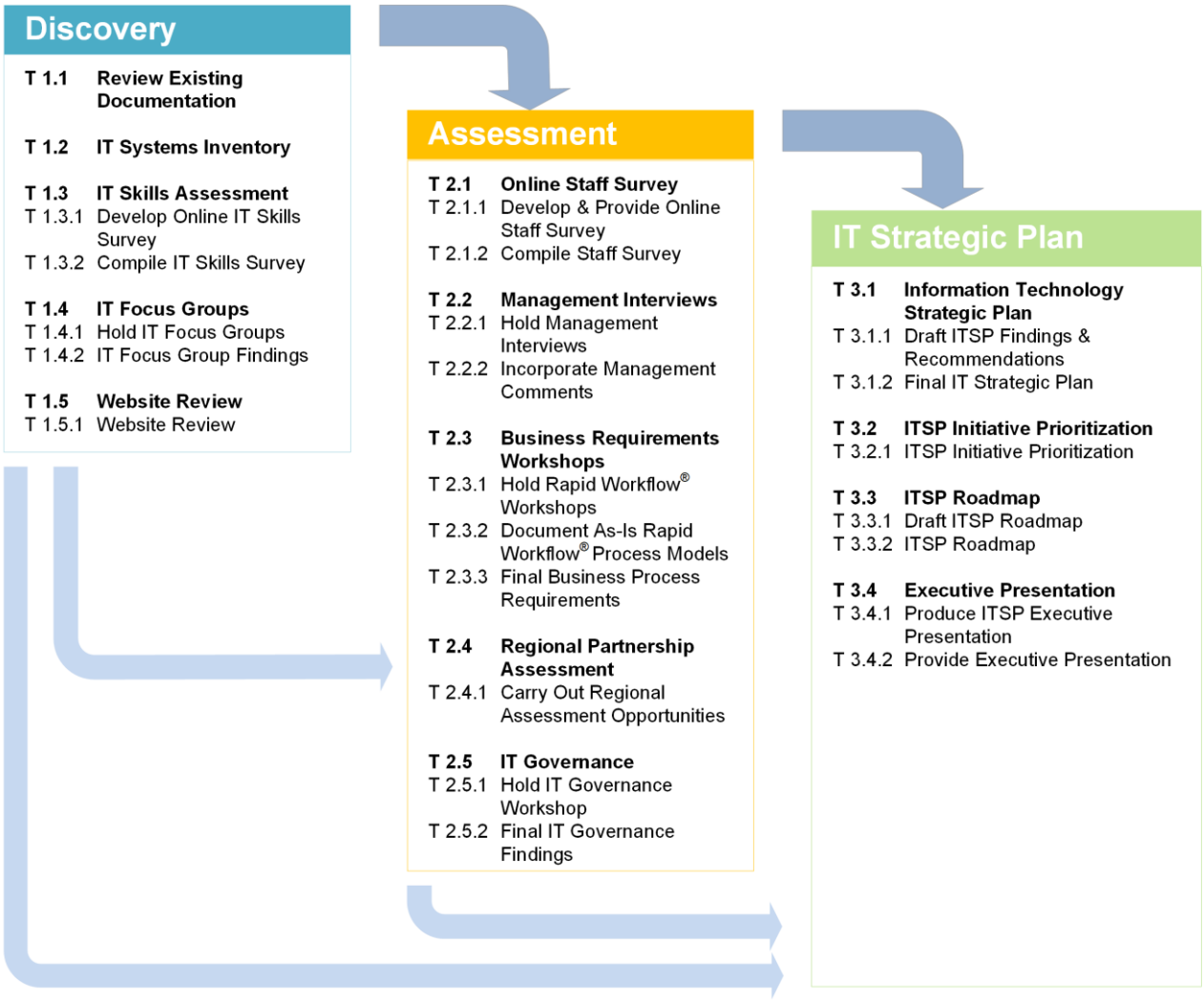
Figure 2.2.1: Comprehensive Project Methodology



The project employed ThirdWave's patented Enterprise Architecture data-driven methodology where data from one phase informs the subsequent project phases and forms the basis for the final recommendations and strategy.

Phase 1: Discovery Phase: established a baseline understanding of the City's IT and business systems environment, including a survey of existing Information Technologies.

Phase 2: Requirements Assessment Phase: engaged a broad section of stakeholders, including:

- City Department Heads: in management interviews soliciting a management perspective on current and future operating challenges faced by departments.
- City staff: seventeen (17) business requirements workshops were held to address departmental and enterprise operating/service delivery needs. The workshops had

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a total of 73 (seventy-three) staff participated. Many staff attended multiple workshops for a total participation level of 77 (seventy-seven).

- IT staff: four focus groups addressing infrastructure, hardware, software, and IT operations and service delivery.

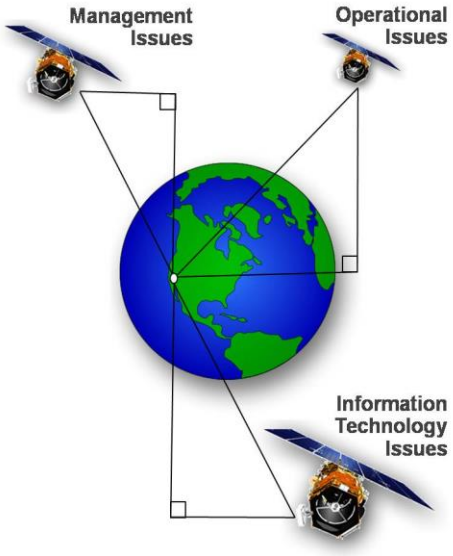
Phase 3: Strategic Plan and Roadmap Phase: synthesized all of the data collected in previous tasks to produce prioritized technology initiatives, budget estimates and implementation plan.

The ITSP Roadmap identifies opportunities for improving business processes and customer service through policy, process and/or Information Technology initiatives.

Figure 2.2.2: Comprehensive Project Framework

ThirdWave's IT Strategic Planning framework triangulates on all key facets of the organization to get a crisp definition of business, functional and technology requirements to produce responsive and actionable recommendations. The project employed a participatory process including:

- ***Management Interviews:*** To address business unit missions, business architecture, governance structure, management policies, strategic planning, fiscal and staff resource allocation to effectively sustain the ITSP Roadmap.
- ***Online Staff Survey/Business Process Workshops:*** To address citywide needs and opportunities for streamlined business processes, methods and procedures, and tools required by staff to provide extraordinary service delivery to the public.
- ***Technology Focus Groups:*** To address strategic information technologies with the appropriate infrastructure, hardware, software, Enterprise Architecture, organizational structure, knowledge, skills and abilities; standards and best practices.



ThirdWave's IT Strategic Planning Triangulation Framework ©1988

ThirdWave's IT Strategic Planning Triangulation Framework recognizes that a viable ITSP must address all needs of the organization, including the customer experience.

This document is not meant to be read in one sitting; it is a reference guide – a roadmap for a five-year journey. The ITSP provides technical descriptions of strategic business/IT initiatives over five years, supported by the rationale for each. This will facilitate the effective planning, procurement, implementation, and management of Information Technologies at the City.

Volume 1 ITSP Findings & Recommendations (this document) describes "what" the City should do, Volume 2, the ITSP Roadmap describes "when" and at what cost.

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Section 3

IT Strategic Plan Findings

3.1 Management Requirements Findings

Management requirements were gathered via interviews. The agenda addressed the following:

1. Obtain a management perspective on unique business challenges facing each department;
2. Gather City-wide functional, operational and service delivery requirements; and,
3. Solicit management input on the IT organization and the level of their support services.

The following City management participated:

1. Police
2. City Clerk
3. City Attorney's Office
4. Economic Development
5. Finance
6. Transportation & FAX
7. Planning & Development
8. General Services Department
9. Budget
10. General Services Department
11. Personnel Systems & Risk Management
12. City Manager's Office
13. Public Works, Admin & Graffiti
14. Public Works, Construction Management
15. Public Works, Traffic Engineering Division
16. City Manager's Office
17. Airports
18. Fire Department
19. DPU Wastewater
20. DPW Director
21. DPU Water Division
22. PARCS

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The figure below summarizes the data collected from the City's leadership team including the most significant technology challenges. Challenges are shown on the left and corresponding number of times an existing challenge was mentioned is reflected under the quantity (Qty.) column. The responses below are for the following question: *"What are the most significant Information Technology challenges facing your department's mission in the next 3 to 5 years?"*

Figure 3.1.1: Management Team Technology Challenges

	Technology Challenges	Qty.
1	Project & Construction Management	3
2	Portfolio/Project Management Software	3
3	Cyber Attacks	3
4	Munis ERP	2
5	CDX Radio System Infrastructure	2
6	Accella Land Management	2
7	CMMS	1
8	Hardware Replacement	1
9	Document Management/Laserfiche	1
10	Agenda Management Process	1
11	Billing Systems	1
12	Contract Management	1
13	Database Administration	1
14	Economic/Project Data Tracking	1
15	FresGO/INFOR Integration	1
16	Furthering GIS Use	1
17	Grants Management	1
18	Lease Management Software	1
19	Microwave Communication	1
20	ProLaw, Access to Information	1
21	SB 1383 Reporting	1
22	Staff Training	1
23	Technology in Council Chambers	1
24	Tracking Case Work/CMMS	1

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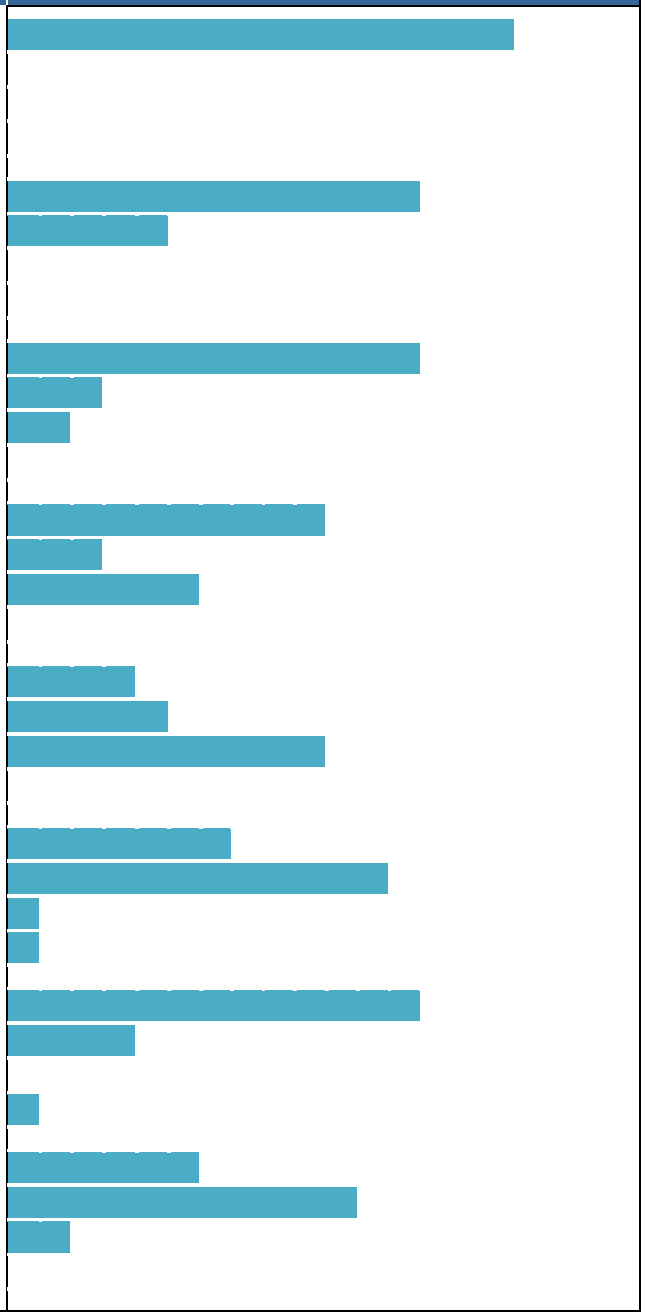
The most significant technology challenges facing City executives are noted in the first two items on the list, GIS and the integration of systems. The following provides a summary of responses provided by the City's management team with regards to how important emerging technologies are to their organization.

Figure 3.1.2: Importance of Emerging Technologies

Emerging Technologies	Rating	#
Digital Workforce/ Workplace	Very Important	16
	Important	0
	Somewhat Important	0
	Not Important	0
Digital Services	Very Important	13
	Important	5
	Somewhat Important	0
	Not Important	0
Mobile Devices	Very Important	13
	Important	3
	Somewhat Important	2
	Not Important	0
Data Analytics	Very Important	10
	Important	3
	Somewhat Important	6
	Not Important	0
Internet of Things	Very Important	4
	Important	5
	Somewhat Important	10
	Not Important	0
Smart City	Very Important	7
	Important	12
	Somewhat Important	1
	Not Important	1
Performance Measurement	Very Important	13
	Important	4
	Somewhat Important	0
	Not Important	1
Data Transparency	Very Important	6
	Important	11
	Somewhat Important	2
	Not Important	0



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Emerging Technologies	Rating	#
Cyber Security	Very Important	16
	Important	0
	Somewhat Important	0
	Not important	0
GIS	Very Important	15
	Important	3
	Somewhat Important	1
	Not Important	0

The three most important emerging technologies for the City's leadership team are digital workflow/workplace, cyber security, and GIS. This data was incorporated in determining the final ITSP initiatives.

The figure below provides a list of management responses for the following question: *"What is your department's level of satisfaction with the IT organization's ability to support your department's current or projected needs based on your perception of one or more of the following?"*

Figure 3.1.3: IT Staffing, Knowledge and Resources Allocation

IT Service Levels	Rating	
Adequateness of staffing levels	Excellent	3
	Very Good	0
	Good	7
	Satisfactory	4
	Poor	3
Technical knowledge/training	Excellent	5
	Very Good	8
	Good	6
	Satisfactory	2
	Poor	1
Budget/allocation of resources	Excellent	1
	Very Good	3
	Good	8
	Satisfactory	0
	Poor	2

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3.1.1 Summary of Management Interviews

The management interviews revealed the following:

- **Technology Challenges:** The top technology challenges relate to project and construction management, portfolio project management and concerns related to cyber security.
- **Emerging Technologies:** The top technologies identified as being most important by the leadership team are Digital Workforce/Workplace, GIS and Cyber Security. Digital Workplace/Workforce and GIS are seen as transformational technologies that need to be more evenly accepted and applied across the organization. Cyber Security is an ever-evolving threat that ISD needs departmental support to help adapt to and combat.
- **Staffing levels:** The largest response related to IT staff levels was "Good" at 41%, followed by "Satisfactory" at 23%, and "Poor", 17%.
- **Technical knowledge/training: the majority of** IT staff knowledge was generally rated as "Excellent", 22% and "Very Good", 36%.
- **Budget and allocation of resources:** Budget and allocation of resources was generally rated as "Good", 57%.

3.2 IT Staff Focus Group Findings

Four focus groups were held with IT staff regarding the City's Information Technology portfolio and operation. The following illustrates the challenges and opportunities facing the City in four key technology areas as perceived by IT staff:

- Infrastructure
- Hardware
- Software
- Sustainability & Service Delivery

Legend:

M		Management Issues: related to finance, organizational structure, staffing, training and/or policy.
O		Operational Issues: related to operations, service delivery, methods and/or procedures.
T		Technology Issues: related to any aspect of information technology.

1.	**Infrastructure**	**M**	**O**	**T**
1.1	**Network Infrastructure and Public Safety Radio**			
	1. Lack staff with the needed capabilities to support ongoing operations			
	2. Land mobile radio system is old, and is analog			
	3. The age of the equipment in place			

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1.2 Voice and Data Telecommunications

1. The age of components
2. Single point of failure for video systems
3. Lack of proper funding for system

1.3 Broadband

1. Lack of funding to deploy last mile broadband
2. Lack digital literacy in disadvantaged areas of city utilizing broadband.
3. Lack of funding and support to empower/enforce Dig Once policy

1.4 VPNs

1. Users are not required to use Multi Factor Authentication via VPN to log in, ISD moving to a full MFA environment.

1.5 Firewalls & Security

1. Lack of funding for ongoing licensing and security tools
2. Insufficient staff to support the firewalls

1.6 Switches

1. Age and end of life of the equipment
2. Lack of established replacement plan, and the management of this equipment.
3. Departments putting unauthorized equipment on the network

1.7 Power Systems (UPS, PDUs, generators)

1. Age of the equipment
2. Not all critical sites have generators.

1.8 Firmware, OS

1. The need to support and maintain manufacturer unsupported firmware and OS.

1.9 Server Room/Data Center (HVAC)

1. PD and Municipal Service Center cooling and power constraints
2. PD can't do upgrades due to existence of asbestos in the PD HQ Data Center.
3 The PD rack at City Hall is almost full
4. Radio Facilities: Have residential grade HVAC equipment and commercial applications for the radio network, or none at all, but need commercial-grade equipment

2. Hardware

2.1 Servers and Server Virtualization

1. Migrating from older hardware
2. New hardware is currently heavily utilized, impeding the migration
3. Don't really track how new projects impact capacity (unless it's a large project.)
4. ISD in not involved early in the process, lack requirements as a result
5. ISD is provided a project (and not recognized as a stakeholder)
6. Projects presented to ISD miss window for procurement beyond deadline

2.2 Storage and Backup

1. Managing user personal data
2. Users storing personal data on city networks (photos, videos, shareware, etc.)

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2.3 Desktops and Laptops

1. Zen Works, managing desktop product, risk of availability in long haul
2. Aging imaging and desktop managing infrastructure
3. ITSM solution, Novell Service Desk, is old; doesn't meet current needs, end of support may be near

2.4 Mobile Devices: Smart Phones & Tablets

1. Cell phone transfer of files for backup or restore text message
2. Use of third-party manual process/hardware solution needed
3. Telecom Expense Management Challenges
4. Lack easy way to give a hierarchy of Admin access to Techs within mobile device management software (Intune)
5. System design is not ideal
6. Need to Improve Account4
7. Human element for data entry when adding new accounts within Account4 by pulling data from 10X/10C Ticketing system and ability to pull reports of all data

3. Application & Database Software M O T

3.1 Databases

1. Unknown Access and MySQL databases appear in City environments
2. Over 200 databases on 2012 and other outdated versions of SQL Server.
3. Lack a highly available cluster of database servers.
4. Managing the size of large databases (2 – 4 TB data) engineering design data.
5. Managing user personal data, which is continuously growing.

3.2 Application Software Portfolio

3.2.1 Enterprise Software

1. Some departments are meeting their own needs by subscribing to their own software, without consulting ISD
2. When vendors change their licensing model and increase prices faster than CPI

3.2.2 Department Software

1. ISD application approval process and security issues
2. Do not have consistent document management across departments
3. An enterprise taxonomy was not adopted by Laserfiche

3.2.3 Web Enabled Applications

1. SharePoint, have a hybrid of old and new: On-prem SharePoint and Cloud
2. Policy requires ISD have an on-premise MS Exchange email server which is not integrated with MS 365

3.2.4 Application Integration

1. Use interfaces that are not industry standard
2. Some software, e.g., Naviline and Peoplesoft, do not have APIs for them

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4.	GIS	M	O	T
4.1	**Consolidation of GIS Systems**			
	1. Duplication of effort in several departments		■	
	2. IVIEW and GIS Toolbox, two web applications built with the same data			■
4.2	**Data & Software Obsolescence**			
	1. 30-year-old data requires software that is that old			■
	2. Have not clearly identified what is obsolete		■	
4.3	**GIS Data Workflows**			
	1. Data introduced by various sources/departments is not up to date.			■
	2. There is a lack of standard written/documented workflows or procedures		■	
4.4	**GIS Software Standardization**			
	1. Employees are using software that is not standard (or obsolete)	■		
	2. Not using best practices, e.g., not using ArcGIS Utility Network	■		
	3. Using AutoCAD and home-grown integration to move data back and forth		■	
	4. Government is 2-5 years behind Private sector when updating hard/software			■
4.5	**Staff Resource Availability**			
	1. Not enough GIS staff to complete work assigned	■		
4.6	**Training**			
	1. Growth and training are not prioritized	■		
	2. Training and conference attendance is not budgeted for	■		
	3. GIS training is generally outranked by department priorities	■		
	4. GIS is evolving and growing, which requires ongoing learning and training	■		
	5. There is little to no non-GIS staff training available on how to use GIS	■		
4.7	**Centralization of Processes and Teams**			
	1. There are work process silos throughout the departments and teams		■	

5.	IT Organization & Operations	M	O	T
5.1	**IT Organization & Staff Levels**			
	1. Recruitment, filling vacancies, staff retention	■		
	2. Inability to keep up with private sector compensation	■		
	3. Having and funding positions to begin with	■		
	4. Staff have gotten used to working remotely	■		
5.2	**Consulting Contracts**			
	1. Hire consultants to do work on enterprise systems		■	
	2. Professional services are limited due to procurement constraints		■	
	3. The existing procurement process does not fit IT needs		■	
5.3	**IT Staff Knowledge, Skills, and Abilities**			
	1. It is difficult to recruit staff	■		
	2. Existing staff do not have the KSA's needed to do the work	■		
	3. ISD has limited input on IT candidate hiring, Personnel lacks an understanding of what skills are needed and what IT skills are relevant	■		

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5.4 IT Governance
1. Departments outside of ISD buy systems and get consultants on their own .....

5.5 Requirements Definition
1. Requirements are not done in a consistent manner, or not done at .....

5.6 Project Management
1. Follow PMI practices but not across the board .....
2. ISD and IT staff are seen as a service organization – not a project organization .....
3. ISD rarely viewed as an important project stakeholder .....
4. Lack of city-wide PMO and or project management standards.....

5.7 System Administration
1. Diffusion of staff across multiple responsibilities .....

5.8 Policies and Procedures
1. ISD has extensive internal policies and procedures in place .....

5.9 Business Continuity and Disaster Recovery
1. Need to develop a better DR plan reflecting a post-centralization world. .....
2. City's Continuity of Operations Plan is not being updated, tested or trained on .....

5.10 Disaster Recovery Site
1. MSC DR Site .....
2. There are power and cooling availability issues.....
3. Lack a standard Cyber Security framework .....
4. Getting all city departments on board is a challenge .....

3.2.1 Summary of IT Focus Groups

Figure 3.2.1.1, IT Focus Group Problems Statement Dashboard, provides a high-level overview of the four technology support areas addressed in the IT Focus Groups. The most challenging is the IT organization and service delivery model. It provides a summary of findings.

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Figure 3.2.1.1: IT Focus Group Problem Statement Dashboard

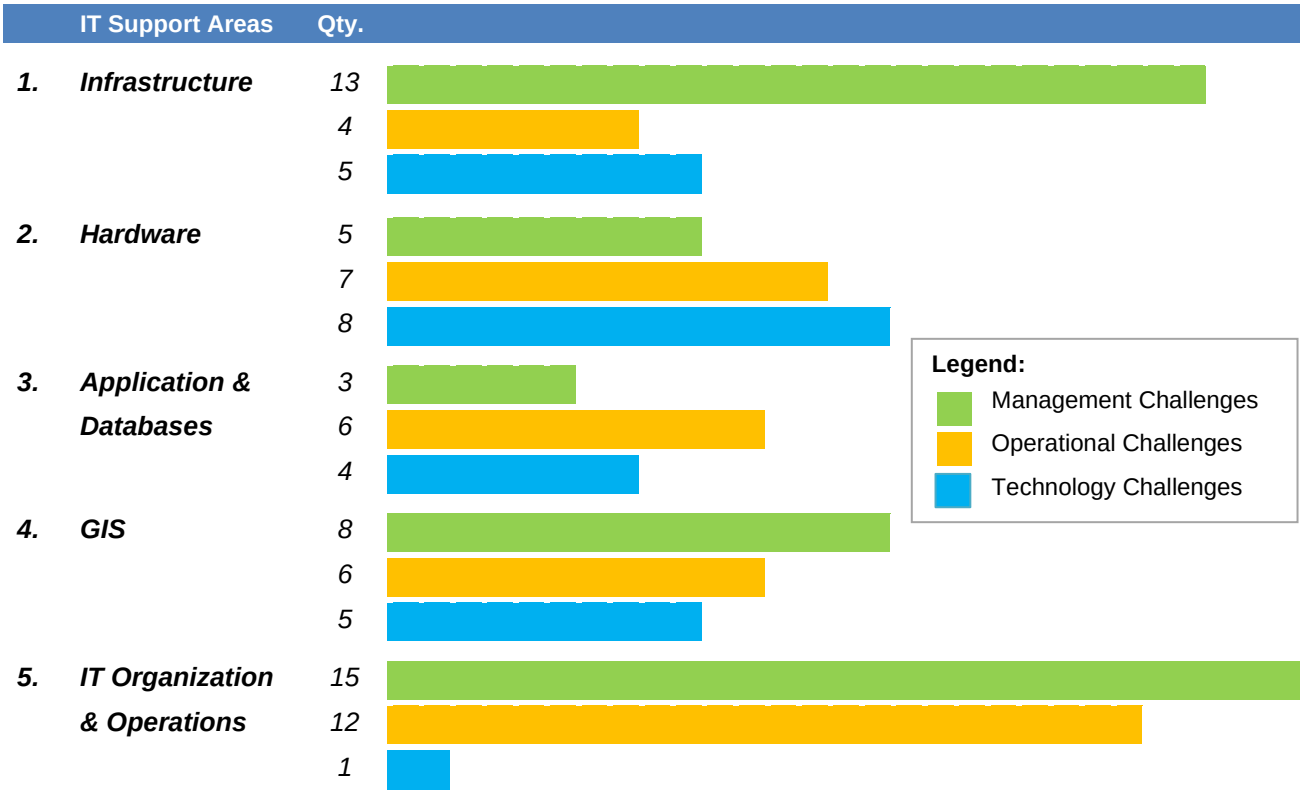

Figure 3.2.1.2 below provides an overall summary of the challenges identified by IT staff during the IT Focus Groups. While the compiled instances of management, operational and technology problems are not weighted, this dashboard provides a general indicator of existing challenges identified by the City's IT staff.

Figure 3.2.1.2: Overall Summary of IT Department Challenges

The figure above indicates the most significant challenges faced by the IT organization relate to a variety of management and organizational issues. This data is aligned with other findings in the discovery and requirements definition phases of the project. (Solutions from the IT Focus Groups are incorporated into section 2.5 Summary of Technology Requirements.)

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3.3 City Staff Online Survey


City of FRESNO
IT/GIS Strategic Plan & Roadmap

City of Fresno IT/GIS Strategic Plan Staff Survey

Introduction

The City of Fresno is carrying out an IT/GIS Strategic Plan (IT/GIS SP). The Strategy will help inform how emerging technologies can best support your work unit and prioritize projects across the City. The objectives of the project are to:

- Carry out an evaluation of the City's business and service delivery needs
- Address the most critical technology needs of the organization
- Produce a 5-year roadmap for improving the City's Information Technologies, including hardware, software, implementation, IT skills sets, staff training and related estimated costs

In order to develop the most responsive strategy, we are seeking feedback directly from City staff. We are looking for your open and honest responses.

The survey should take approximately 5 minutes to complete. The data collected will be added to other data collected in the project and used to develop a roadmap in line with, and in support of, efficient and responsive City operations. Your feedback is essential in helping define the most significant business and service delivery requirements to produce a technically viable and financially sound DSP and Roadmap.

Let us know if you have any questions. Thanks for participating!

Bryon Horn, CISSP, PMP
Chief Information Officer
Information Services Department
City of Fresno
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Roy Hernandez
DSP Project Manager
ThirdWave Corporation
roy.hernandez@thirdwavecorp.com

The data on the following pages was gathered via an online survey that allowed all City staff the opportunity to provide input on the City's existing systems, and ISD's ability to support them.

The survey also gathered requirements in a number of areas related to emerging technologies and how the IT Department could better support City staff and the community of Fresno.

The online survey was posted from September 1 to September 16. **Two-hundred and seven (207) City staff responded to the survey.** The level of staff engagement represents one of the highest ThirdWave has seen in working with approximately 200 (two-hundred) cities over 35 years.

The online survey addresses the following:

- Overall condition of the City Information Systems
- The state of existing systems
- Information Technology needs
- Information Systems requiring improvement
- Services provided by Information Services
- Emerging Technologies

The data contained in this document will be referenced and incorporated into the findings and recommendations in the final phase of the IT Strategic Plan and Implementation Roadmap.

The following provides a summary of findings from the Staff Online Survey:

- Approximately one third of staff rated the overall condition of the City's Information Technologies as Very Good (31.4%) and Good (43.96%) for a combined positive percentage of 75.36%.
- Out of networks, phone systems, hardware and mobile devices, phones systems were rated the highest by City staff. Mobile devices were rated as being the Most Needed by 37.44% of responders.
- Regarding existing Application Software, Council Meeting Agenda and GIS software was rated the highest by responders, while Business Licensing was rated the lowest.

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- Regarding engineering related software, GIS was rated the highest by responders (Excellent 7.54% and Very Good 12.56%). End User Training was rated the lowest, with 15.38% of responders rating it Poor.
- Regarding existing engineering/departmental software, End User Training was rated the lowest, with 15.38% of responders rating it Poor. Cyber Security software was rated the highest by responders. Permitting software was rated the lowest, with 11.86% of responders rating it Poor.
- Regarding GIS software and use, the current State of Existing GIS was rated the highest by responders (Excellent 7.54% and Very Good 12.56%).
- Regarding existing enterprise software, HR/Payroll were rated the highest by responders and Agenda Management was rated the lowest. Software rated as being the most needed included Enterprise Resource Planning (currently being implemented), E-Signatures, Automated Workflow, and Document/Records Management.
- In a question asking what areas of IT require the most improvement, the top three of 14 items, staff responded Hardware, Application Software and Infrastructure (Networks).
- When asked to rate which social media technologies would best enhance customer service, the top-rated web technologies identified by City staff were E-Government Apps (40.31%) providing online customer services, followed by YouTube (15.54%).
- A number of questions related to adopting Apple Macs in the workplace, including:
  - Interest in using a Mac: 65.20% stated they would not be interested.
  - Being more efficient using a Mac: 73.13% stated they would not be more efficient.
  - If Mac was available but could not support all work: 84.24% stated, they would not use one.
- When asked how important it is for the City's website to provide online services the overwhelming answer was Very Important (69.08%) and Important (26.29%), for a combined total of 93.59%.
- When asked to rate a range of 12 services provided by the IT organization, staff rated the Help Desk and Ongoing Technical Support the highest. End User Training and IT Project Management & Delivery were rated the lowest.
- When asked to provide input on the City's most significant IT challenges 103 (one hundred three) staff responded voluminous amounts of written comments, which indicate clear patterns of areas for improvement.

The figure below provides an overall view of how City staff perceive the services the IT organization provides City staff.

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The figures below illustrate staff responses in two key areas.

Figure 3.3.1: Staff Rating of Services Provided by ISD

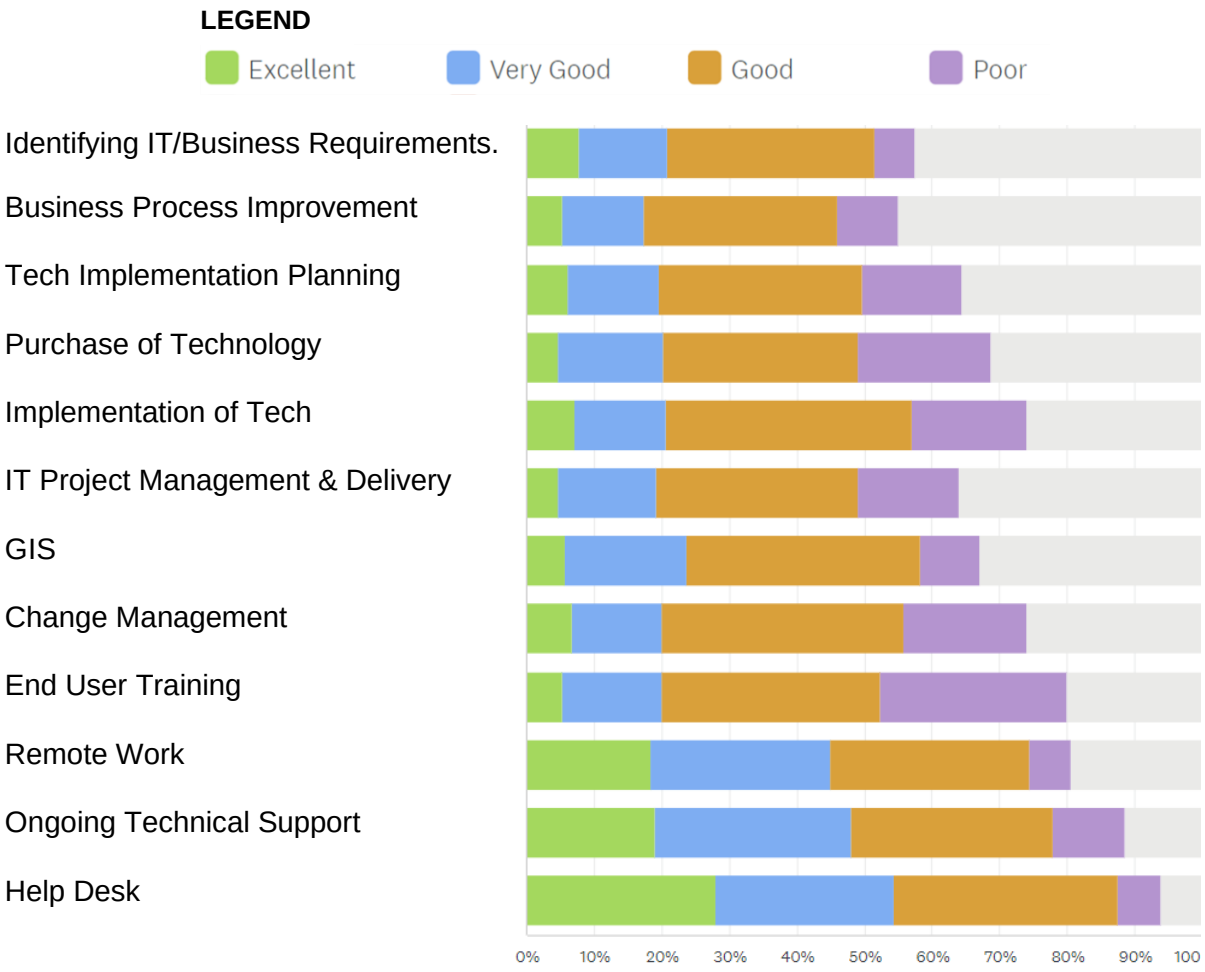

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Figure 3.3.2: Staff Rating of Overall Condition of the Information Systems

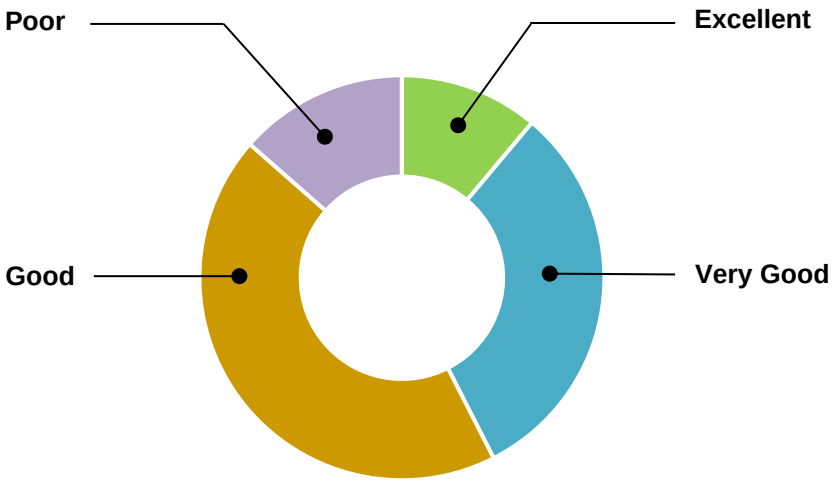
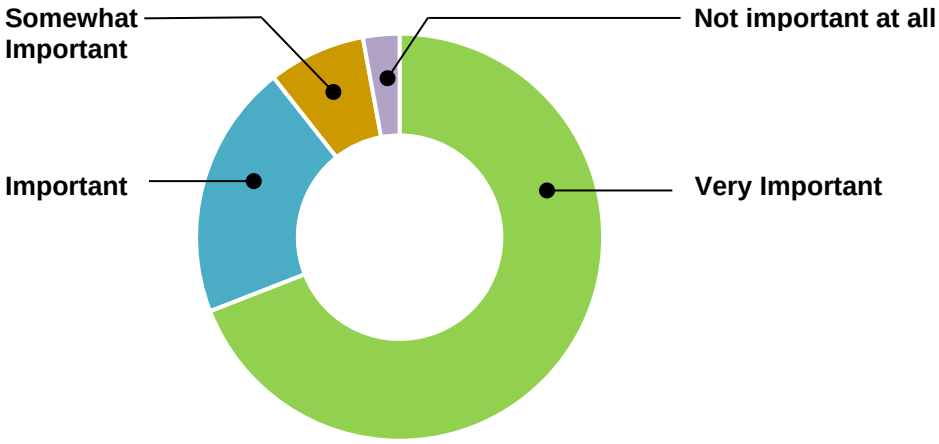


Figure 3.3.3: Staff Rating on Importance of City Website Providing Online Services



As demonstrated by Figure 3.3.2, staff responses reveal that most staff consider the overall condition of the Information Systems they use to Good (43.96%), followed by Very Good (31.40%), Excellent (11.11%), and Poor (13.453%).

As demonstrated by Figure 3.3.3, most staff consider the importance for the City website to provide online services Very Important (69.08%), followed by Important (26.29%), Somewhat Important (43.96%), and Not Important at All (13.53%).

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3.4 Rapid Workflow® Workshops

A comprehensive assessment of City-wide operational and service delivery requirements was carried out in the ITSP project. ThirdWave's patented Rapid Workflow® Business Process Improvement workshops were held with business process owners/subject matter experts.

The workshops encompassed a detailed analysis of mission-critical business functions listed below. Business challenges and opportunities for improvements that might be addressed with Information Technologies, Business Process Change and/or Policy Change were reviewed with staff and management.

Seventeen (17) Rapid Workflow® workshops were held from March 31, 2023 to August 15, 2023. Staff attendance and input was outstanding. Seventy-three (73) City staff and management representing all departments participated in the workshops. Consequently, total participation in the workshops consisted of seventy-seven (77) business subject matter experts and IT staff. The following workshops were held.

1.	3.31	Police Department Requirements
2.	4.03	DPU, Wastewater: Project Planning
3.	4.04	Vertical Asset Management
4.	5.17	Economic Development: Project Tracking Performance
5.	5.24	City Clerk: Record & Document Management
6.	5.25	Planning & Development/Building - Completeness
7.	6.14	General Services - Lease Management: Owned & Leased Building
8.	6.16	Transportation & Fresno Area Express - National Transit Database
9.	7.06	Budget
10.	7.13	Public Works (Admin & Graffiti)
11.	7.14	Public Works - Construction Management Division
12.	7.24	City Attorney Transactions - Regular Assignment
13.	7.25	Public Works – Traffic Engineering Division
14.	7.25	General Services Department – Airports
15.	7.27	Public Works - Engineering Division
16.	7.27	PARCS
17.	8.15	General Services Department – Airports

The data collected informed the ITSP initiatives shown in Section 3.4 of this document and was used to prioritized initiatives in Volume II, Roadmap.

Figure 3.4.1, Sample Rapid Workflow® Business Process Map, on the next page provides a visual sample (it is not meant to be legible) of a process map produced with City stakeholders.

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Figure 3.4.1: Sample Rapid Workflow® Business Process Map

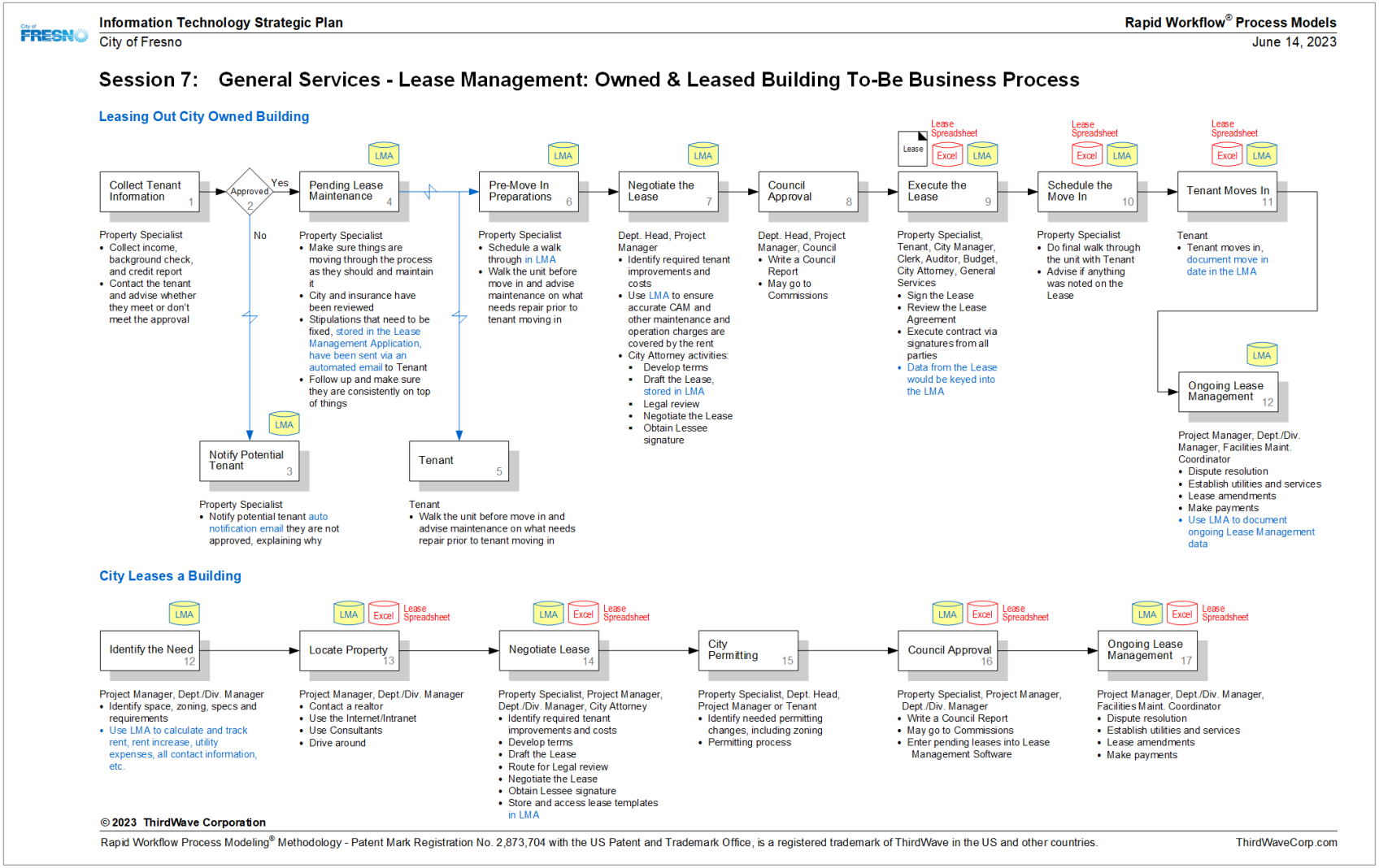
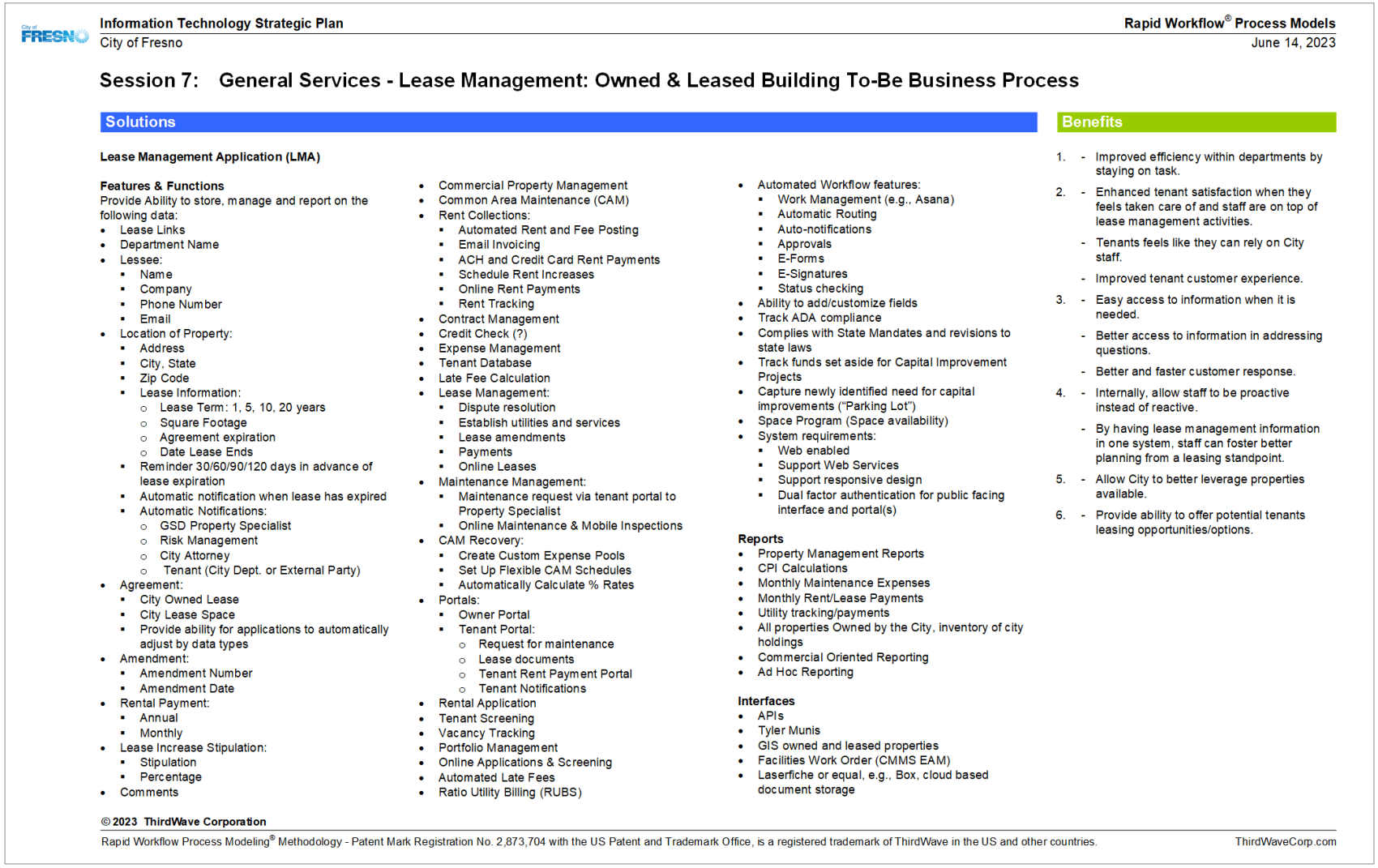


Figure 3.4.2: Sample Rapid Workflow® Business Process Narrative



Information Technology Strategic Plan — **Rapid Workflow® Process Models**
City of Fresno — June 14, 2023

Session 7: General Services - Lease Management: Owned & Leased Building To-Be Business Process

Solutions

Lease Management Application (LMA)

Features & Functions
Provide Ability to store, manage and report on the following data:

- Lease Links
- Department Name
- Lessee:
  - Name
  - Company
  - Phone Number
  - Email
- Location of Property:
  - Address
  - City, State
  - Zip Code
  - Lease Information:
    - Lease Term: 1, 5, 10, 20 years
    - Square Footage
    - Agreement expiration
    - Date Lease Ends
  - Reminder 30/60/90/120 days in advance of lease expiration
  - Automatic notification when lease has expired
  - Automatic Notifications:
    - GSD Property Specialist
    - Risk Management
    - City Attorney
    - Tenant (City Dept. or External Party)
- Agreement:
  - City Owned Lease
  - City Lease Space
  - Provide ability for applications to automatically adjust by data types
- Amendment:
  - Amendment Number
  - Amendment Date
- Rental Payment:
  - Annual
  - Monthly
- Lease Increase Stipulation:
  - Stipulation
  - Percentage
- Comments
- Commercial Property Management
- Common Area Maintenance (CAM)
- Rent Collections:
  - Automated Rent and Fee Posting
  - Email Invoicing
  - ACH and Credit Card Rent Payments
  - Schedule Rent Increases
  - Online Rent Payments
  - Rent Tracking
- Contract Management
- Credit Check (?)
- Expense Management
- Tenant Database
- Late Fee Calculation
- Lease Management:
  - Dispute resolution
  - Establish utilities and services
  - Lease amendments
  - Payments
  - Online Leases
- Maintenance Management:
  - Maintenance request via tenant portal to Property Specialist
  - Online Maintenance & Mobile Inspections
- CAM Recovery:
  - Create Custom Expense Pools
  - Set Up Flexible CAM Schedules
  - Automatically Calculate % Rates
- Portals:
  - Owner Portal
  - Tenant Portal:
    - Request for maintenance
    - Lease documents
    - Tenant Rent Payment Portal
    - Tenant Notifications
- Rental Application
- Tenant Screening
- Vacancy Tracking
- Portfolio Management
- Online Applications & Screening
- Automated Late Fees
- Ratio Utility Billing (RUBS)
- Automated Workflow features:
  - Work Management (e.g., Asana)
  - Automatic Routing
  - Auto-notifications
  - Approvals
  - E-Forms
  - E-Signatures
  - Status checking
- Ability to add/customize fields
- Track ADA compliance
- Complies with State Mandates and revisions to state laws
- Track funds set aside for Capital Improvement Projects
- Capture newly identified need for capital improvements ("Parking Lot")
- Space Program (Space availability)
- System requirements:
  - Web enabled
  - Support Web Services
  - Support responsive design
  - Dual factor authentication for public facing interface and portal(s)

Reports

- Property Management Reports
- CPI Calculations
- Monthly Maintenance Expenses
- Monthly Rent/Lease Payments
- Utility tracking/payments
- All properties Owned by the City, inventory of city holdings
- Commercial Oriented Reporting
- Ad Hoc Reporting

Interfaces

- APIs
- Tyler Munis
- GIS owned and leased properties
- Facilities Work Order (CMMS EAM)
- Laserfiche or equal, e.g., Box, cloud based document storage

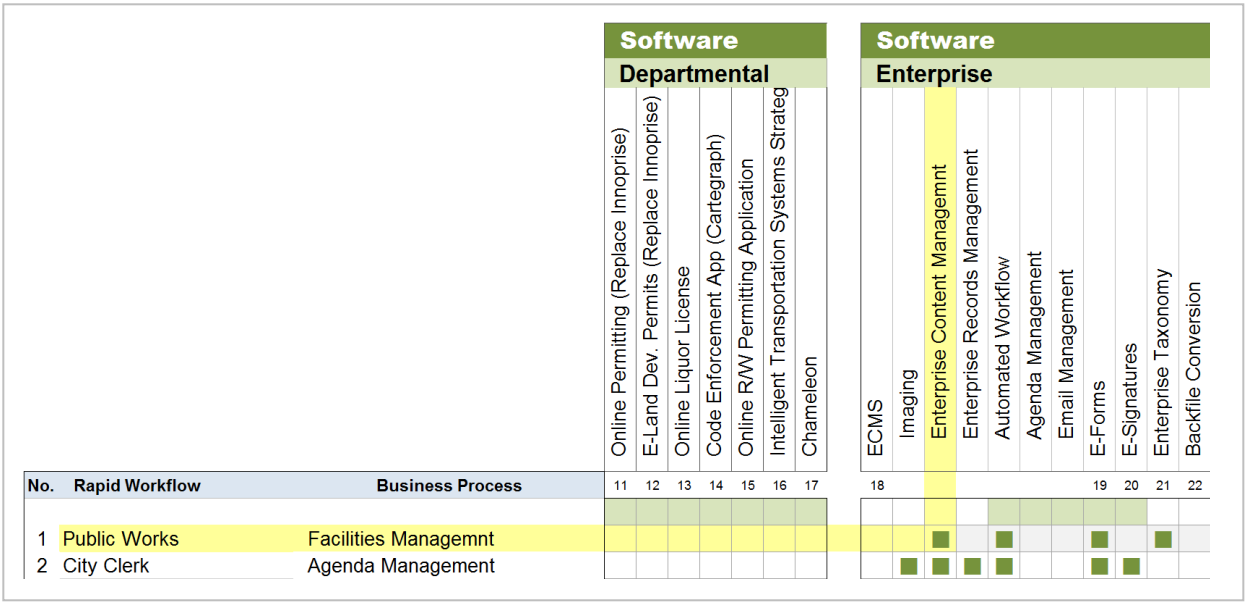
Benefits

1. - Improved efficiency within departments by staying on task.
2. - Enhanced tenant satisfaction when they feels taken care of and staff are on top of lease management activities.
   - Tenants feels like they can rely on City staff.
   - Improved tenant customer experience.
3. - Easy access to information when it is needed.
   - Better access to information in addressing questions.
   - Better and faster customer response.
4. - Internally, allow staff to be proactive instead of reactive.
   - By having lease management information in one system, staff can foster better planning from a leasing standpoint.
5. - Allow City to better leverage properties available.
6. - Provide ability to offer potential tenants leasing opportunities/options.

3.5 Leading Technology Initiatives

The ITSP project identified numerous Information Technology initiatives related to infrastructure, hardware, software solutions and IT Operations. The figures on the following pages provide a matrix of all operational and technology initiatives identified in the project. It bears noting that the initiatives identified in the figures starting with Figure 3.5.2 are for reference purposes; the list will be reviewed and prioritized in the *ITSP Volume 2: Roadmap.*

Figure 3.5.1: Sample Enterprise Initiative Matrix



How to read the matrices:

The enterprise initiative matrix provides a list of Rapid Workflow® process workshops, IT Focus Groups and Management Interview requirements on the left column. Each square symbol on that line indicates an IT initiative identified in that workshop, focus group or management interview. The technology initiative is denoted above in the vertical text. In this illustration, the first initiative for the Public Works Facilities Management workshop is Enterprise Content Management; the second initiative is Enterprise Records Management, and so on.

Detailed descriptions for each ITSP initiative are provided in Section 4, Information Technology Strategic Plan Recommendations, in this document.

The figures on the following pages (Figures 3.5.2 through 3.5.7) illustrate where each of the initiatives was identified in the ITSP project, e.g., management interviews, IT Focus Groups, or Rapid Workflow® workshops. This is important for traceability purposes; in future years of the ITSP Implementation Roadmap, City staff will be able to reference where recommendations came from.

Figure 3.5.2: Infrastructure & Hardware Requirements

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

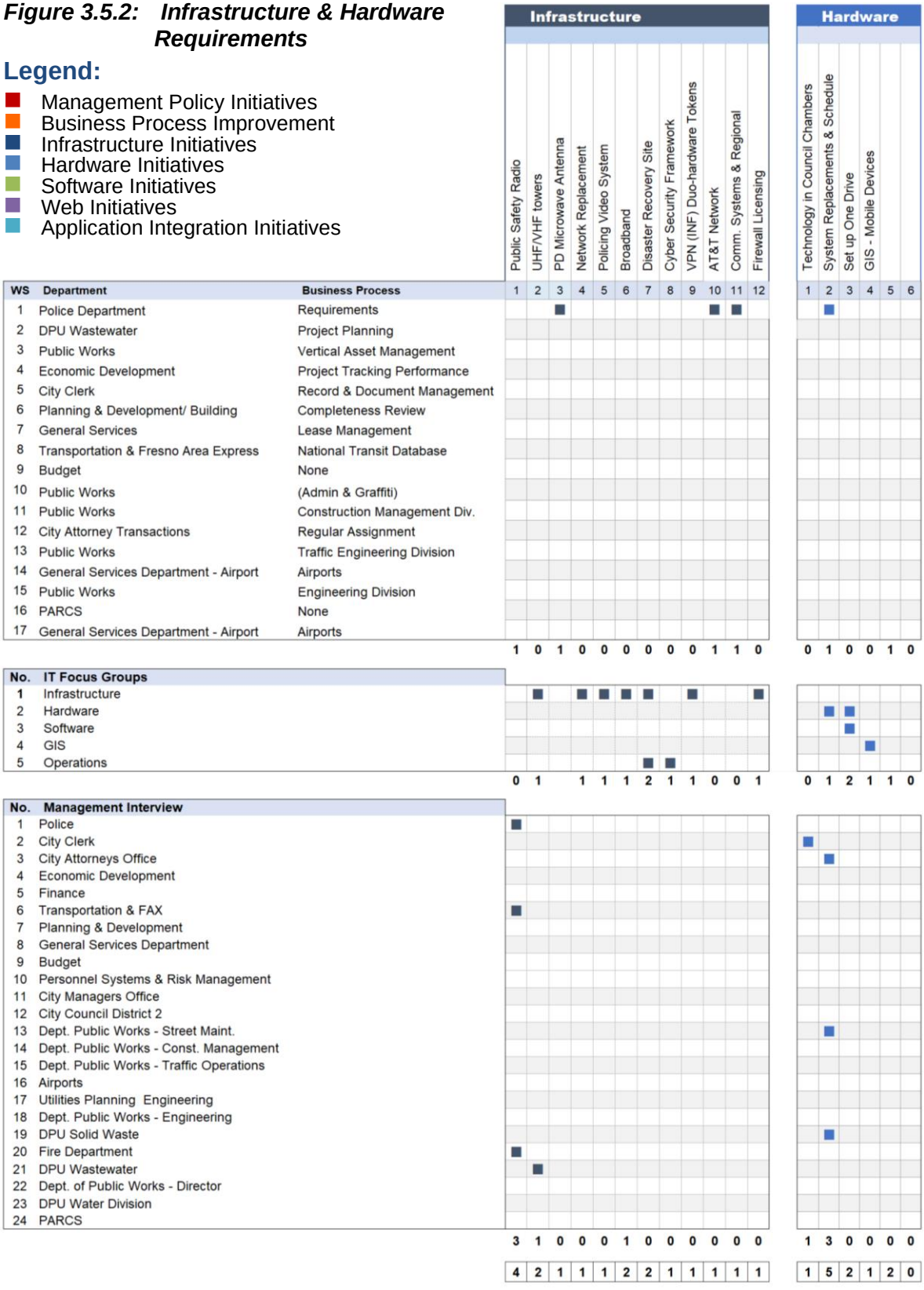


Figure 3.5.3: Department Software Requirements

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

Dept. Software

WS	Department	Business Process	1 ProLaw	2 Economic Dev. Project Tracking	3 CMMS (WO / Asset Management)	4 Construction Estimating	5 Project Portfolio Management	6 Lease Management Software	7 IT Service Management Software	8 Device-to-device Data Transfers.	9 SharePoint – MS 365 Strategy	10 Device Management Software	11 Investigation Management	12 Lease Management Application	13 NTD Database	14 Accela Enhancements	15 Project Portfolio & Const Management	16 Legal Contract Management	17 Software Updates	18 SB 1383 Reporting
1	Police Department	Requirements											■							
2	DPU Wastewater	Project Planning																		
3	Public Works	Vertical Asset Management																		
4	Economic Development	Project Tracking Performance																		
5	City Clerk	Record & Document Management																		
6	Planning & Development/ Building	Completeness Review														■				
7	General Services	Lease Management												■						
8	Transportation & Fresno Area Express	National Transit Database													■					
9	Budget	None																		
10	Public Works	(Admin & Graffiti)																		
11	Public Works	Construction Management Div.				■														
12	City Attorney Transactions	Regular Assignment																		
13	Public Works	Traffic Engineering Division														■				
14	General Services Department - Airport	Airports																■		
15	Public Works	Engineering Division															■			
16	PARCS	None																		
17	General Services Department - Airport	Airports																		
			0	0	0	1	0	0	0	0	0	0	1	1	1	2	2	1	0	0

No.	IT Focus Groups
1	Infrastructure
2	Hardware
3	Software
4	GIS
5	Operations

			0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0

No.	Management Interview
1	Police
2	City Clerk
3	City Attorneys Office
4	Economic Development
5	Finance
6	Transportation & FAX
7	Planning & Development
8	General Services Department
9	Budget
10	Personnel Systems & Risk Management
11	City Managers Office
12	City Council District 2
13	Dept. Public Works - Street Maint.
14	Dept. Public Works - Const. Management
15	Dept. Public Works - Traffic Operations
16	Airports
17	Utilities Planning Engineering
18	Dept. Public Works - Engineering
19	DPU Solid Waste
20	Fire Department
21	DPU Wastewater
22	Dept. of Public Works - Director
23	DPU Water Division
24	PARCS

			1	1	3	3	1	1	0	0	0	0	0	0	0	3	3	0	1	1
			1	1	3	4	1	1	1	1	1	1	1	1	1	5	5	1	1	1

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Figure 3.5.4: Enterprise Software Requirements

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

WS	Department	Business Process	CRM (1)	Grants Management (Future Tyler) (2)	Purchasing (3)	Upgrade SQL Server (4)	One Drive (5)	One GIS Portal (6)	GIS Utilization (7)	GIS Data Consolidation (8)	GIS Standardization (9)	GIS Web-based Tools (10)	SharePoint - MS 365 Strategy (11)	Enterprise Content Management (12)	ECMS Taxonomy (13)	Automated Workflow (14)	Records Management Policies (15)	iManage Standard Procedures (16)	Access & MySQL Database (17)
1	Police Department	Requirements																	
2	DPU Wastewater	Project Planning												■	■				
3	Public Works	Vertical Asset Management												■		■			
4	Economic Development	Project Tracking Performance	■																
5	City Clerk	Record & Document Management															■		
6	Planning & Development/ Building	Completeness Review														■			
7	General Services	Lease Management																	
8	Transportation & Fresno Area Express	National Transit Database																	
9	Budget	None																	
10	Public Works	(Admin & Graffiti)																	
11	Public Works	Construction Management Div.																	
12	City Attorney Transactions	Regular Assignment																■	
13	Public Works	Traffic Engineering Division																	
14	General Services Department - Airport	Airports																	
15	Public Works	Engineering Division																	
16	PARCS	None																	
17	General Services Department - Airport	Airports												■	■	■			
			1	0	0	0	0	0	0	0	0	0	0	3	2	3	1	1	0

No.	IT Focus Groups																		
1	Infrastructure					■													
2	Hardware					■													
3	Software				■	■							■	■	■				■
4	GIS						■	■	■	■	■	■							
5	Operations																		
		0	0	0	1	2	1	1	1	1	1	1	1	1	1	0	0	0	1

No.	Management Interview																		
1	Police																		
2	City Clerk													■					
3	City Attorneys Office	■																	
4	Economic Development																		
5	Finance		■																
6	Transportation & FAX																		
7	Planning & Development																		
8	General Services Department			■															
9	Budget																		
10	Personnel Systems & Risk Management																		
11	City Managers Office																		
12	City Council District 2		■																
13	Dept. Public Works - Street Maint.																		
14	Dept. Public Works - Const. Management																		
15	Dept. Public Works - Traffic Operations																		
16	Airports																		
17	Utilities Planning Engineering																		
18	Dept. Public Works - Engineering																		
19	DPU Solid Waste																		
20	Fire Department																		
21	DPU Wastewater																		
22	Dept. of Public Works - Director																		
23	DPU Water Division																		
24	PARCS																		
		1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
		2	2	1	1	2	1	1	1	1	1	1	5	3	3	1	1	1	

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Figure 3.5.5: Web Initiatives & Interfaces

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

			Web			Interfaces				
			Public Portal (Web)			Fresno - Infor Integration	Account4 – 10X-10C System	EAM/EIMS Integration		
WS	Department	Business Process	1	2	3	1	2	3		
1	Police Department	Requirements								
2	DPU Wastewater	Project Planning								
3	Public Works	Vertical Asset Management						■		
4	Economic Development	Project Tracking Performance								
5	City Clerk	Record & Document Management								
6	Planning & Development/ Building	Completeness Review		■						
7	General Services	Lease Management								
8	Transportation & Fresno Area Express	National Transit Database								
9	Budget	None								
10	Public Works	(Admin & Graffiti)								
11	Public Works	Construction Management Div.								
12	City Attorney Transactions	Regular Assignment								
13	Public Works	Traffic Engineering Division								
14	General Services Department - Airport	Airports								
15	Public Works	Engineering Division								
16	PARCS	None								
17	General Services Department - Airport	Airports								
			0	1	0	0	0	1	0	0

No.	IT Focus Groups									
1	Infrastructure									
2	Hardware						■			
3	Software									
4	GIS									
5	Operations									
		0	0	0	0	1	0	0	0	

No.	Management Interview									
1	Police									
2	City Clerk	■								
3	City Attorneys Office									
4	Economic Development									
5	Finance									
6	Transportation & FAX									
7	Planning & Development									
8	General Services Department									
9	Budget									
10	Personnel Systems & Risk Management									
11	City Managers Office									
12	City Council District 2									
13	Dept. Public Works - Street Maint.									
14	Dept. Public Works - Const. Management									
15	Dept. Public Works - Traffic Operations									
16	Airports									
17	Utilities Planning Engineering									
18	Dept. Public Works - Engineering									
19	DPU Solid Waste									
20	Fire Department									
21	DPU Wastewater									
22	Dept. of Public Works - Director					■				
23	DPU Water Division									
24	PARCS									
		1	0	0		1	0	0	0	0
		1	1	0		1	1	1	0	0

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Figure 3.5.6: Operational Policies & Process Improvements

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

WS	Department	Business Process	Operations: Cyber Security (1)	Video Lifecycle Replacement Plan (2)	Switch Replacement Plan (3)	Email Exchange Policy (4)	PM & Project Portfolio Management (5)	Disaster Recov. /Bus. Continuity Plan (6)	GIS Template & Best Practices (7)	Generator Replacement Schedule (8)	Enhanced Network Performance (9)	Requirements Definition Method (10)	Construction Cost Management (11)
1	Police Department	Requirements									■		
2	DPU Wastewater	Project Planning											
3	Public Works	Vertical Asset Management											
4	Economic Development	Project Tracking Performance											
5	City Clerk	Record & Document Management											
6	Planning & Development/ Building	Completeness Review										■	
7	General Services	Lease Management											
8	Transportation & Fresno Area Express	National Transit Database											
9	Budget	None											
10	Public Works	(Admin & Graffiti)											
11	Public Works	Construction Management Div.											
12	City Attorney Transactions	Regular Assignment											
13	Public Works	Traffic Engineering Division											
14	General Services Department - Airport	Airports											
15	Public Works	Engineering Division											
16	PARCS	None											
17	General Services Department - Airport	Airports											
			0	0	0	0	0	0	0	0	1	1	0

No.	IT Focus Groups										
1	Infrastructure		■	■					■		
2	Hardware										■
3	Software				■						
4	GIS							■			
5	Operations	■				■	■			■	
		1	1	1	1	1	1	1	1	0	2	1

No.	Management Interview										
1	Police										
2	City Clerk										
3	City Attorneys Office										
4	Economic Development										
5	Finance										
6	Transportation & FAX										
7	Planning & Development										
8	General Services Department	■									
9	Budget										
10	Personnel Systems & Risk Management										
11	City Managers Office										
12	City Council District 2										
13	Dept. Public Works - Street Maint.										
14	Dept. Public Works - Const. Management										
15	Dept. Public Works - Traffic Operations										
16	Airports										
17	Utilities Planning Engineering										
18	Dept. Public Works - Engineering										
19	DPU Solid Waste										
20	Fire Department										
21	DPU Wastewater	■									
22	Dept. of Public Works - Director										
23	DPU Water Division	■									
24	PARCS										
		3	0	0	0	0	0	0	0	0	0	0
		4	1	1	1	1	1	1	1	1	3	1

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Figure 3.5.7: Management Policies & Practices

Legend:

- Management Policy Initiatives
- Business Process Improvement
- Infrastructure Initiatives
- Hardware Initiatives
- Software Initiatives
- Web Initiatives
- Application Integration Initiatives

Management

WS	Department	Business Process	1 IT Governance	2 ISD Organization Resources	3 IT Staff	4 PD Application / DB Programmer	5 MSS Staff	6 CAO Application Support	7 End User Staff Training	8 Hexagon EAM/ Cognos	9 GIS Training Program	10 Non Permit Tech Staff	11 Funding for Dig Once Policy	12 Streamline IT Recruitment	13 Support One Dig Policy
1	Police Department	Requirements		■	■	■									
2	DPU Wastewater	Project Planning								■					
3	Public Works	Vertical Asset Management								■					
4	Economic Development	Project Tracking Performance													
5	City Clerk	Record & Document Management													
6	Planning & Development/ Building	Completeness Review			■							■			
7	General Services	Lease Management													
8	Transportation & Fresno Area Express	National Transit Database													
9	Budget	None													
10	Public Works	(Admin & Graffiti)													
11	Public Works	Construction Management Div.													
12	City Attorney Transactions	Regular Assignment		■				■							
13	Public Works	Traffic Engineering Division													
14	General Services Department - Airport	Airports													
15	Public Works	Engineering Division													
16	PARCS	None													
17	General Services Department - Airport	Airports													
			0	2	2	1	0	1	0	2	0	1	0	0	0

No.	IT Focus Groups												
1	Infrastructure	■	■	■		■					■		■
2	Hardware												
3	Software	■							■				
4	GIS	■											
5	Operations	■										■	
		4	1	2	0	1	1	0	0	1	1	1	1

No.	Management Interview												
1	Police												
2	City Clerk			■									
3	City Attorneys Office			■				■					
4	Economic Development												
5	Finance												
6	Transportation & FAX												
7	Planning & Development												
8	General Services Department							■					
9	Budget												
10	Personnel Systems & Risk Management												
11	City Managers Office												
12	City Council District 2												
13	Dept. Public Works - Street Maintenance.												
14	Dept. Public Works - Const. Management												
15	Dept. Public Works - Traffic Operations												
16	Airports												
17	Utilities Planning Engineering												
18	Dept. Public Works - Engineering												
19	DPU Solid Waste												
20	Fire Department												
21	DPU Wastewater	■											
22	Dept. of Public Works - Director												
23	DPU Water Division							■					
24	PARCS												
		1	0	2	0	0	0	3	0	0	0	0	0
		5	3	6	1	1	2	3	2	1	2	1	1	1

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The figure below provides a summarized list of technology initiatives identified in the ITSP project Enterprise Initiative Matrix® shown in the previous pages. ITSP initiatives are grouped by type of technology, then sorted in descending order in terms of how many times they were identified in the course of the project. However, the initiatives below are not prioritized; initiatives are prioritized in the companion document to this report, the *ITSP Volume 2: Roadmap*.

Figure 3.5.8: ITSP Technology Initiatives (Not Prioritized)

No.	Abbr.	Type	Times Mentioned
	INF	**Infrastructure**	
1.	INF 1	Public Safety Radio	5
2.	INF 2	UHF/VHF towers	2
3.	INF 3	Broadband	2
4.	INF 4	PD Microwave Antenna	1
5.	INF 5	Network Replacement	1
6.	INF 6	Policing Video System	1
7.	INF 7	Disaster Recovery Site	1
8.	INF 8	Cyber Security Framework	1
9.	INF 9	VPN Duo-hardware Tokens	1
10.	INF 10	AT&T Network	1
11.	INF 11	Firewall Licensing	1
	HW	**Hardware: Servers, Workstations, Peripherals**	
12.	HW 1	Systems Replacement Schedule	5
13.	HW 2	Set up One Drive	2
14.	HW 3	GIS – Mobile Devices	1
15.	HW 4	Technology in Council Chambers	1
	D SW	**Departmental Software**	
16.	D SW 1	Accela Enhancements	5
17.	D SW 2	Project Portfolio & Construction Management Software	5
18.	D SW 3	Construction Estimating Software	4
19.	D SW 4	CMMS (WO / Asset Management) Software	4
20.	D SW 5	Economic Development Project Tracking Software	1
21.	D SW 6	Lease Management Software	1
22.	D SW 7	IT Service Management Software	1
23.	D SW 8	Device-to-Device Data Transfers.	1
24.	D SW 10	Device Management Software	1
25.	D SW 11	Internal Investigation Management Software	1
26.	D SW 12	National Transit Database	1
27.	D SW 13	Legal Contract Management Software	1
28.	D SW 14	Construction Bid Process Improvement	1
29.	D SW 14	SB 1383 Reporting	1

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	M	Management Policies
51.	M 1	IT Governance 5
52.	M 2	ISD Organization Resourcing
52.1	M 2.1	GIS Technicians 2
52.2	M 2.2	PD Application/DB Programmer 1
52.3	M 2.3	NSS Staff 1
52.4	M 2.4	Desktop Support 1
52.5	M 2.5	Network Support 1
52.6	M 2.6	More Staff - Higher Pay 3
52.7	M 2.7	City Attorney Office Application Support 2
52.8	M 2.8	Hexagon EAM/Cognos 2
53.	M 3	End-user Training 2
54.1	M 3.1	Non-Permit Tech Staff 2
54.2	M 3.2	Prolaw 2
54.3	M 3.3	City Attorney Mailbox 2
54.4	M 3.4	Employees Cross Training 1
54.5	M 3.5	Formal GIS Training Program 1
54.6	M 3.6	Munis GL Module 1
55.	M 4	IT Staff Training 1
56.	M 5	Funding for Dig Once Policy 1
57.	M 6	Funding for Firewall 1
58.	M 7	Streamline IT Recruitment 1
59.	M 8	Streamline Procurement Process 1
60.	M 9	Supported One Dig Policy 1

Section 4
ITSP Recommendations

4.1 Introduction to ITSP Recommendations

The following pages provide the findings and recommendations for the ITSP. This reflects the City's input, IT industry best practices, ThirdWave's thirty-five years of experience in this arena and one-hundred and fifty-six similar projects we have carried out.

This section of the ITSP includes a description of technology initiatives reflecting input provided in all phases of the project. This document captures all solutions discussed throughout the project.

It is important to note **that not all solutions identified** in Figure 3.5.7: ITSP Technology Initiatives may be included in *Volume II Roadmap*. The fact that a solution was mentioned by City staff in a requirements definition task does not automatically constitute a recommended technology. The Roadmap does not include needs that lacked a compelling business case or sufficient justification. Therefore, there is not a one-to-one relationship with items in the figures listed above and recommended solutions in the following pages.

The City can use this document, however, as a reference document over the next five years to revisit all solutions identified in the course of the ITSP project.

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4.2 ITSP Implementation Roadmap Initiatives

This section provides a description of IT solutions identified in various tasks of the ITSP project, including infrastructure, hardware and software initiatives.

4.2.1 Technology Recommendations

The following City-wide technology recommendations are informed by all phases of discovery and requirements definition tasks of the ITSP project. (The number in parenthesis indicates the number of the Rapid Workflow® [RW] workshop, IT Focus Group [ITFG] or Management Interviews [MI].) Recommendations synthesize staff input and industry best practices, as appropriate, for the City's technological landscape and organizational culture.

The findings identified here relate to technology issues, but in some cases, operational and management issues are also referenced in these findings where they relate specifically to technology recommendations.

For reference purposes, each of the following initiatives is followed by an abbreviation, listed below. These indicates which task(s) in the project the solution was identified in.

Figure 4.2.1.1: ITSP Initiative Traceability

[MI #]	Management Interview
[ITFG #]	IT Focus Group
[RW #]	Rapid Workflow® Workshop, the number indicates the specific workshop
[SS #]	Staff Survey

INF Infrastructure

The ITSP project assessed various infrastructure, networking, and communications technologies. Various IT operational opportunities were also assessed as part of the project. Our findings and recommendations on infrastructure issues are provided below.

INF 1 Public Safety Radio [MI 1] [MI 6]

Findings:
The management interview with the Police Department revealed it has a Radio System that is antiquated and is in need of an overhaul. Many components are end of life/end of support and there are weekly issues with some part of the system which interfere with human safety. The city needs to re-evaluate the network to identify weaknesses, improve on those weaknesses. and prepare for a digital upgrade. If the City decides to go to a digital platform, there could be a $35m price tag and a 5-year implementation

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timeline. This project will include implementing existing systems while implementing the proposed systems.

The management interview with Transportation FAX revealed that department has a 30-year-old radio system in desperate need up upgrading. (They are moving to 700 MHz system.)

INF 2 UHF/VHF Towers [IT 1] [MI 21]

Findings:
The Infrastructure IT Focus Group revealed the City's land mobile radio system is old and analog. This results in the following:

- Lack of coverage.
- Reliability.
- Interference.
- Don't have one system to cover all radio needs and maintaining compatibility with peers in the area.
- Existing systems are out of support.

Recommendations:

- Modernize the equipment (UHF/VHF towers systems needed to maintain interoperability with regional partners who are not 700 MHz system users.
- Find locations and install more towers to improve the coverage.
- Make a final determination to move to a digital system, which could be 700 mhz with an estimated cost of $35m. May have to do a reassessment, find a consultant to lead the effort.
- Produce and RFP for implementation.

Benefits:

- Improved reliability.
- Encryption, meet DOJ requirements.
- Better coverage.
- Penetrates the walls of buildings.
- Increased public safety (PD/FD, Public Works, etc.).

INF 3 Broadband [IT 1]

Findings:
The IT Focus Group revealed there is a lack of funding to deploy last mile broadband. This results in:

- Unserved and underserved areas of the City, below the standard definition of Broadband by the federal government; 25 MB download and 3MB upload. (Certain grant funding requires the delivery of services at 100 mbps, symmetrical.)

Recommendations:

- Received some funding for design in limited parts of the city, but need funding for build out.

Benefits:

- Help community and students get broadband.
- Expand the digital economy to all areas of the city.

INF 4 PD Microwave Antenna [RW 1]

Findings:
The Rapid Workflow® business process workshop with the Police Department revealed the communication systems at the Regional Training Center is beyond its end of life. This results in:

- Prevents communication with the regional training center via the network.
- If the regional training center lacks network capability, cannot conduct training for PD or outside departments.

Recommendations:

- Replace the existing microwave antenna at the training center, including systems at both ends, estimated to cost approximately $250k.

Benefits:

- Network availability.
- Ability to conduct training.
- Meet post requirements.
- Generate revenue to support center with training provided to outside parties.

INF 5 Network Replacement [ITFG 1]

Findings:
The old age of the equipment in place (some equipment has been procured). (A network replacement project has been underway for some time, one of ISD's major stumbling blocks has been staff turnover and what is believed to be a lack of sufficient staffing.) This results in the following:

- Spending a lot of staff time supporting equipment that is at end of life.
- Lack of performance equipment will provide relative to the need.

- Lack of equipment reliability.
- Staff time re-directed from projects and operations, and shifting priorities for ISD.

Recommendations:
- Development of a predicted funded Network Replacement plan, backed by other findings:
  - Increased staffing levels
  - Add ISD Project Management Group
  - Technology Governance

Benefits:
- Reduced staff stress.
- Improved service delivery.
- Reduced staff OT.
- Reduced outages, increased up times.

INF 6 Policing Video System [ITFG 1]

Findings:
The Infrastructure IT Focus Group revealed the age of components of the Video Policing system presents a single point of failure for video. This system has never been properly funded. This results in:
- Poor reliability of video feeds.
- Staff time to support equipment.
- On the services end, there are request for video feeds that can't be met due to diffusion of staff across multiple other responsibilities.

Recommendations:
- Properly fund and design the video system, to not have a single point of failure.
- Develop a Lifecycle Management Plan and funding plan.
- Establish a more robust highly available architecture, in line with the business needs of the system.
- Allocate additional dedicated ISD staff resources to support the growing number of video systems across the City. (Existing staff who support video systems presently split their time on other systems of higher priority, e.g., public safety radio/microwave).

Benefits:
- Improved security, via reliable camera system.
- Used for identifying and taking action on a variety of events.
- Improved public safety.

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INF 7 Disaster Recovery Site [ITFG 1, ITFG 5]

Findings:
The Infrastructure IT Focus Group revealed the following:

- PD and the Municipal Service Center (MSC) facilities have cooling and power constraints.
- The PD Data Center is below-grade and could be subject to flooding.
- The PD rack at City Hall is almost full.

The foregoing results in:

- Single points of failure.
- Limited to what can be deployed because of cooling and power constraints.
- Limited redundancy because of power limitations.
- Due to the growth of the City's technology needs, MSC is no longer able to support the redundancy of critical services.
- Asbestos: hard to make improvements in any of the plants (HVAC, Power) because of the presence of asbestos.
- Impacts equipment life and reliability.

Recommendations:

- Implement a fully capable DR Site.
  - Requirements for sites:
    - IPN POD Site.
    - Sufficient security, space, power, and cooling.
    - 24x7 ISD access.
    - Diverse, redundant fiber connection.
- Replication of existing sites.
- Assess what can go to a cloud DR site or co-location.

Benefits:

- More reliable operations.
- Improved robustness of City operations.
- Reduce equipment failures and downtime.
- Reduce the cost of using other carriers. For instance, there is a local company offering to provide services at 1/3 less of the AT&T costs (which the City already has a relationship with).

INF 8 Cyber Security Framework [ITFG 5]

Findings:
The IT Focus Group revealed while ISD follows NIST, they have not set a standard cyber security framework as a policy. Getting all city departments on board is a challenge. This results in:

- Cyber Security Insurance becoming the enforcer of policy and security measures.
- Exposures to cyber-attacks.

Recommendations:

- Adopt a cyber security framework across the organization.

Benefits:

- Provide more flexibility to implement.
- Improved cyber security posture for the City.
- More time to vet cyber security processes and implement them smoothly instead of immediately.

INF 9 VPN - Duo-Hardware Tokens [ITFG 1]

Findings:
The IT Focus Group revealed the City has users who are not required to use Multi Factor Authentication (MFA) via VPN to log in. This results in compromising the cyber security stand of the City. All bad actors need is a name and password.

Recommendations:

- Issue all City employees who use VPN Duo-hardware Tokens.

Benefits:

- Cost savings.
- Would not have to furnish staff cell phones.
- Possibly reduce the City's cyber security insurance coverage cost, allowing improved coverage or preventing loss of coverage.

INF 10 AT&T Network [RW 1]

Findings:
The Rapid Workflow® business process workshop with the Police Department revealed the AT&T network is not able to cover the whole city, resulting in communication gaps.

Recommendations:

- Have AT&T add cell towers or switch to a different vendor.

Benefits:
- Increase communication.
- Better service.
- Work cases faster.
- Enhanced efficiencies.

INF 11 Firewall Licensing [ITFG 1]

Findings:
The IT Focus Group with ISD staff revealed the City has 40 firewalls, and ISD staff to support team is insufficient. According to ISD staff, funding is also an issue (although this as was not verified). This results in the following:
- Cannot use required licensing to get all of the required functions in the firewall, including security functions. For instance, new functionality requires licensing – new features cannot be enabled.
- If security features can't be activated, a layer of defense cannot be enabled.
- Challenging to support appropriately, lack of staff requires spreading the responsibility across staff.

Recommendations:
- Funding for licensing.
- Funding for staffing and training.

Benefits:
- Improved security.
- Faster response time for changes and outages.

HW Hardware: Servers, Workstations, Peripherals

HW 1 System Replacements [RW 1] [MI 14] [MI 21]

Findings:
Generally speaking, ISD has done a commendable job providing City staff needed technologies during the pandemic. However, the need for ongoing system replacements, and their associated schedules, was brought in several project tasks.

- **Police Department**: Rapid Workflow® business process workshop revealed the existing network can be slow. This results in affecting mobile data computers (MDCs), and can delay distributing important information, response with GPS, or Officers, missing an address. There are issues with slow computers with 16MB RAM, resulting the slow distribution of information and staff frustration.

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Recommendations:
- Fund the MDC replacement plan developed by ISD and PD
- Provide computers with at least 32 MB of RAM.

Benefits:
- Provide Officers real time information on important details to 911 calls.
- Enhanced internal efficiencies.

- **PW Construction Management:** The Management Interview revealed the field staff have "little technology," e.g., laptops and smart phones. This results in limiting collection and access to information in the field.

  Recommendations:
  - Carry out an inventory of specific devices required by field staff.
  - Provide systems appropriately configured to support the application requirement and bandwidth required in the field.

  Benefits:
  - Enhanced service delivery.
  - Improved efficiencies.
  - Workflow automation.

HW 2 GIS – Mobile Devices [ITFG 4]

Findings:
The IT GIS Focus Group with ISD staff revealed GIS staff lack access to mobile devices that can be used to develop and test web apps on mobile devices. This results in:
- Delayed rollout of an application that could improve business processes.
- GIS Specialist are unfamiliar with the app view on a tablet or phone, delaying helping the requestor.

Recommendations:
- Assure that GIS/SysApps and other staff involved in the development of mobile applications have relevant, supported devices that reflect what is in use in the field, quantities provided as needed for development and ongoing support. Use these tools to train other staff.

Benefits:
- Mitigates delays.
- Will enable training other staff, side by side or leading a training in a training room with multiple participants.

HW 3 Technology in Council Chambers [MI 2]

Findings:
The Management Interview with the City Clerk revealed they are unsure if all technology in the council chamber will function properly. There are many players involved: ISD, technology partners, and the public. They noted that it feels like the Council Chamber technology has been haphazardly added, instead of a cohesive configuration of technology.

Recommendations:
- ISD carry out an assessment of all technology used in the Council Chambers to ensure all components are working in concert.
- Allocate funding previously requested by ISD to make the necessary improvements.

Benefits:
- Successfully provide a community function required by law.
- Carry out council meetings with confidence that the public interest will be served.

D SW Department Software

Departmental software are applications meeting specific or unique internal department functionality. In general, public-sector organizations tend to have decentralized approaches for the procurement and deployment of departmental application software, which is often predicated by the organization's budget process. The lack of an enterprise approach typically results in disparate departmental Information Technology, various home-grown, stand-alone "shadow" systems that are usually unsupported, and one-off applications. These systems can also present security risks.

The following departmental applications were identified in the course of the project; their selections and implementations should all go through an IT Governance best practice and a detailed business, technical and functional specifications development and benchmarking to evaluate and procure the most responsive and cost-effective solutions.

D SW 1 Accela Enhancements [RW 6] [RW 13]

Findings:
The management interviews with Planning & Development revealed the requirements for Code Enforcement, Fire, Public Work, Public Utilities were not completely defined, and they all access the system. The system was launched prematurely. (ISD is currently working on this.)

The Rapid Workflow® business process workshop with the Public Works, Traffic Engineering Division, related to Accela enhancements revealed the following:

1. Applicant do not always submit the correct or complete application, which results in:
   - Application is not approved in a timely manner.
   - Applicants are unaware their application is not being processed, which causes customer frustration.
   - Perception of poor customer service.
   - Large businesses wait, and when the City fails to contact them, they decide to go to another city to establish their businesses.
2. City staff cannot see the incomplete application the applicant has submitted in Accela, which results in:
   - The inability to notify applicant of additional needed processing.
   - Inability to proceed with the review.
3. Frequent users, e.g., architects and engineers, complain about Accela, which results in unhappy customers.
4. First time users do not like Accela and are unable to use it at all, which results in staff time to walk applicant through it. (4-40 staff members involved in this process at a time. It can take 5-60 minutes a day.)

Recommendations:

- Add a feature to the Accela application to notify applicants application has not been submitted.
- Explore the ability for Accela to send whomever is the appropriate CAO staff person the application is incomplete.
- Request contact information of the architect, engineer, developer, and owner and send appropriate parties a notification the application is incomplete.
- Provide links to online videos on how to use Accela.
- Providing first time users videos similar to Building Permits.

Benefits:

- Mitigate calls from customers to Council and department heads.
- Reduce customer calls.
- Eliminate developments that get canceled or go elsewhere, lost revenue to the City.
- Promote a customer friendly reputation for potential new development.
- Staff time savings.
- Reduced stress and grief.
- More knowledge on application and potential projects.
- Speed up the execution of projects.
- Better perception of the City.
- More business-friendly City posture.
- Enhance customer service.
- Better applications leading to faster processing time.

D SW 2 Project Portfolio & Construction Management Software [RW 15] [RW 11]

Findings:
The Rapid Workflow® business process workshop with the Public Works, Engineering Division, related to portfolio project management revealed the following:

1. Inability to track Life to Date Costs and budget burned against the schedule, which results in inefficient project delivery and not knowing corrections need to be made on the project.
2. Inefficient interdepartmental communication, which results in delayed project schedules, a certain amount of animosity between departments, and creates confusion.
3. Overly cumbersome processes, e.g., Plan checking, Staff Reports, Charters: electronic vs hardcopy. All staff get PDFs vs storing documents in an accessible storage space. This results in:
   - Inefficiencies.
   - Project delays.
   - Additional costs.
   - Hardcopy documents require driving and moving paper.
4 Project documents may be stored in multiple storage drives, with multiple copies within the same department, for instance:
   - L Drive with access to everybody within department
   - Grant Planning L Drive
   - Capital Project Development K Drive
   - Construction Management:

   This results in the following:
   - Difficulty retrieving relevant information.
   - Accessing information staff needs is difficult.
   - May miss something staff didn't know existed.
   - Multiple data and documents stored in multiple locations.
   - Cost of storage.
5. The Excel Budget Worksheet is difficult to use, e.g., take data in the worksheet, simplify it, and relay it to other departments, which results in:
   - Inefficiencies.
   - Staff time to complete.
   - Confusion.
   - Miscommunications regarding project estimates vs budgets.
6. The use of Outlook for document management, which results in:
   - Project delays.
   - Staff lack access to current data.
   - Could lead to Change Orders.
   - Inability to find the best solution to problems.

7. Inability to tie email correspondence to a project electronically, e.g., no way for staff to go through emails of other staff regarding projects, even after the project is closed out. This results in the following:
   - Staff do not have current data.
   - Overloaded staff email inboxes.
   - Staff stress.
   - Staff may eventually tune out and only read what they perceive to be critical.
8. Lack a tool to track expiring permits. Often times, permits are obtained too far in advance during the design process, and they expire during the construction phase. No one is aware it has expired and there is lag getting a permit extension. This results in:
   - Construction delays.
   - Potential Change Orders.
   - Inconvenience to public.
   - Can become a Public Relations issue.
   - Businesses have taken their businesses to other cities, lost revenue for the City.
9. Project Manager budgeting errors and missed reporting, which results in:
   - May jeopardize funding.
   - May end up short of funding.
   - Inability to issue amendments.
   - Inability to award construction contracts.
   - Missed requests for budget allocation between fiscal years, carry over dollars.
   - Might need to reduce scope.
   - Schedule extensions.
10. Inability to track or trigger processes based upon the completion of certain milestones, resulting in schedule delays.
11. Cannot determine what Project Managers have availability to take on additional work, which results in schedule delays and impacts project delivery.

The Rapid Workflow® business process workshop with the Public Works, Construction Management Division, related to construction management software requirements revealed the following:

1. This division uses archaic systems and lack a construction management system. They currently use Word and Excel to manage the division's projects.
2. There is a lack of technology in the field. All staff only have iPhones.
3. Key statistics on the scale and complexity of this division include:
   - Have approximately 100 open projects at a time.
   - Value = $220 – $240 million.
   - Construction management staff = 45.
   - All projects ever executed are stored in the shared drive.

Recommendations:
Implement a rigorous Project Cost Accounting & Constructions Management Software.

Project Cost Accounting Software

Features & Functions

- Project Cost Accounting:
  - Ability to track Burn Rate vs Schedule.
  - Milestones vs. Schedules vs Burn Rate.
- Budgeting:
  - Overall programming, develop Budget Worksheet.
  - Budget by fiscal year breakdown.
  - Budget by function.
- Project Portfolio Management.
- Milestone tracking.
- Ability to track and trigger processes based upon the completion of certain milestones.
- Track expiring permits.
- Provide ability to:
  - Identify available staff resources.
  - Resource allocation planning, and tracking.
  - Workload balancing.
- Reporting:
  - Grant reporting, e.g., ATP by monthly, quarterly, bi-annually, annually
  - Provide reminders and notification for key reporting dates related to funding.
- Ability to assign tasks.
- Chat feature.
- Workflow automation:
  - Auto notifications.
  - Auto routing of documents.
  - Reminders.
- Large file transfer.

Reports

- Bi-Weekly Report.
- Budget Report.
- Annual Capital Project Report.
- Project Hours.
- Managerial Capital Projects Report: list of all projects, status and milestone, and budgetary including li to day costs.
- Burn Rate Report.

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Construction Management Software

Features & Functions

- Plan Workload.
- Track Workload.
- Organize Workload.
- Collaborative work spaces.
- Customizable Dashboard.
- Track hours worked, vacation and PTO, and how staff availability may impact project schedules.
- Support the Construction Management activities:
  - Contract Approval.
  - Pre-construction Conference.
  - Issue Notice to Proceed.
  - Contract Management.
  - Field Inspections.
  - Solicitations (RFIs/RFPs).
  - Issue Change Orders.
  - Produce Monthly Pay Recaps.
  - Produce Dailies, Weeklies.
  - Substantial Completions.
  - Final Acceptance.
  - Project Closeouts.
- Forms.
- E-signatures.
- Cost Analysis.
- Certified Payroll.
- Recaps.
- Final Recaps.
- Punch List.
- Workflow automation:
  - Automatic routing.
  - Automatic notifications.
  - Reminders.
  - Check status.
  - Task lists.
  - Approvals.
- System Requirements:
  - Web enabled.
  - Support responsive design.
  - SQL Server-based.
- Ability to store project files.

- Generate Construction Management documents:
  - Change Orders.
  - Meeting Notes.
  - Notice to Proceed.
  - Dailies.
  - Weeklies.
- RFIs.
- RFPs.
- Submittals.
- Substantial Completion.
- Ability to store and manage project related data for Active and Inactive projects:
  - Funding Source.
  - TM Identifier.
  - Project I
  - GL Codes.
  - PS Organization.
  - Activity – Project.
- Project Business Unit.
- Description.
- Contractor:
  - First and Last Name.
  - Company.
  - Address.
  - Email.
  - Phone.
- PO Number.
- Bid File Number.
- Project Manager:
  - First and Last Name.
  - Title.
  - Division.
  - Address.
  - Email.
  - Phone.
- Issue Tracker (By Year):
  - Address (By location).
  - City.
  - Contract Value.
  - Project Team:
    - Inspector Name.
    - Sr. Inspector.
    - Chief.
  - Description.
  - Bonding Company.
  - Bonding Number.
  - FAX No.

  - Email Address.
  - Office Phone.
  - Key Dates.
  - EM for TS Removal.
  - Bid Advertise Date.
  - Bid Award Date.
  - NTP Date.
  - Contract Packet Sent.
- Project Status:
  - % Complete.
  - Insurance Approved.
  - Issue Tracker.
  - Macros.
  - Project Files.

Reports
- Daily Reports.
- Weekly Reports.
- Total Spent on Project.
- Total Spent on All Projects.

Interfaces
- Tyler Munis.
- PeopleSoft (Financial and HR).
- Construction Management Database.
- Laserfiche (potentially).
- Accela.
- Caltrans (potentially)
- Upload Fresno site.
- Shared Drives
- Microsoft Teams
- SharePoint

Benefits:
- Better use of time.
- Create opportunity for additional projects.
- Deliver projects on time.
- Eliminate Change Orders.
- Eliminate delays.
- Enhance efficiencies.
- Enhance project delivery on schedule and on budget.
- Enhanced access to information.
- Enhanced business process.
- Faster turnaround.
- Forecast workforce needs, hiring needs, and resource reallocation.
- Free up Project Manager resources during the budget process.

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- Identify early on if additional funding will be needed.
- Improve visibility.
- Improved accuracy.
- Improved productivity.
- Increase funding opportunities.
- Reduced paper use.
- Meet funding deadlines.
- Minimize errors and overruns.
- Project files in one location, from beginning to end, facilitating FOIAs.
- Promote Performance metrics.
- Reallocate funds, if funding is left over.
- Reduce driving back and forth, cost savings on gas and car wear and tear, more environmentally friendly.

D SW 3 Construction Estimating & Management Software [RW 11] [MI 15]

Findings:
The Management Interview with Public Works, Traffic Operations, revealed the need for a construction cost estimating solution. The current process results in going back and looking at previous projects to see how jobs were done, which can be time consuming for staff.

Recommendations:
- Implement construction cost estimation software.

Benefits:
- More complete and detailed construction cost estimates.
- Ability to leverage construction cost data from previous projects.
- Staff time savings.

D SW 4 CMMS Software (WO/Asset Management) [MI 8] [MI 13]

Findings:
The Management Interview with General Services revealed they are seeing a rise in Facilities Maintenance Work Order requests; preventive maintenance will be significant in the next 3 – 5 years. They did not prioritize preventive maintenance until this year, but staff was added this year. General Services currently uses Corrigo, which works but not the way they would like it to.

The Management Interview with Public Works, Street Maintenance, revealed challenges with asset management. (EAM is also used by DPU – Water and Waste Water.) The City currently uses EAM, which according to this interview, is “extremely complex and no one can use it effectively.”

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Recommendations:
Explore evaluating a comprehensive facilities maintenance program, with:
- Work Order Management.
- Asset Management.
- GIS capabilities.
- Life Cycle Costing compatible with mobile devices.
- A system that is easy to use at the novice level; useable by staff with beginning user level computer skills.

Benefits:
- Enhanced work order management and utilization of staff resources.
- Improved facilities maintenance, schedule, planned and predictive maintenance activities and cost effectiveness.
- Lowered facilities maintenance costs.

D SW 5 Economic Development Project Tracking Software [MI 3]

Findings:
The Management Interview with the Economic Development department revealed this is a new department. Economic Development was previously under the City Manager's Office. The department head is building the department from the ground up, including new policies, procedures, and technologies that exist in older economic agencies. Started data tracing in October 2022, and intends to solidify this in the next 5 years.

Recommendation:
Assess implementing economic development software for municipality economic development:
- Gather economic data and market intelligence.
- Data analytics.
- Identify prospective tenants.
- Internal project management.
- Lead tracking.
- Project tracking.

Benefits:
- Allow the City to track visitors, project and economic development data.
- Generate revenue.
- Measure success.
- Attract the right businesses.

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D SW 6 Lease Management Software [RW 7]

Findings:
The Rapid Workflow® business process workshop with General Services revealed the need for a contemporary lease management software for City owned and leased buildings.

Recommendations:

Lease Management Application (LMA): Provide ability to store, manage and report on the following data:

Features & Functions

- Lease Links.
- Department Name.
- Lessee:
  - Name.
  - Company.
  - Phone Number.
  - Email.
- Location of Property:
  - Address.
  - City, State.
  - Zip Code.
  - Lease Information:
    - Lease Term: 1, 5, 10, 20 years.
    - Square Footage.
    - Agreement expiration.
    - Date Lease Ends.
  - Reminder 30/60/90/120 days in advance of lease expiration
  - Automatic notification when lease has expired
  - Automatic Notifications:
    - GSD Property Specialist.
    - Risk Management.
    - City Attorney.
    - Tenant (City Dept. or External Party).
- Agreement:
  - City Owned Lease.
  - City Lease Space.
  - Provide ability for applications to automatically adjust by data types.
- Amendment:
  - Amendment Number.
  - Amendment Date.
- Rental Payment:
  - Annual.
  - Monthly.

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- Lease Increase Stipulation:
  - Stipulation.
  - Percentage.
- Comments.
- Commercial Property Management.
- Common Area Maintenance (CAM).
- Rent Collections:
  - Automated Rent and Fee Posting.
  - Email Invoicing.
  - ACH and Credit Card Rent Payments.
  - Schedule Rent Increases.
  - Online Rent Payments.
  - Rent Tracking.
- Contract Management.
- Expense Management.
- Tenant Database.
- Late Fee Calculation.
- Lease Management:
  - Dispute resolution.
  - Establish utilities and services.
  - Lease amendments.
  - Payments.
  - Online Leases.
- Maintenance Management:
  - Maintenance request via tenant portal to Property Specialist.
  - Online Maintenance & Mobile Inspections.
- CAM Recovery:
  - Create Custom Expense Pools.
  - Set Up Flexible CAM Schedules.
  - Automatically Calculate % Rates.
- Portals:
  - Owner Portal.
  - Tenant Portal:
    - Request for maintenance.
    - Lease documents.
    - Tenant Rent Payment Portal.
    - Tenant Notifications.
- Rental Application.
- Tenant Screening.
- Vacancy Tracking.
- Portfolio Management.
- Online Applications & Screening.
- Automated Late Fees.
- Ratio Utility Billing (RUBS).

- Automated Workflow features:
  - Work Management (e.g., Asana Software).
  - Automatic Routing.
  - Auto-notifications.
  - Approvals.
  - E-Forms.
  - E-Signatures.
  - Status checking.
- Ability to add/customize fields.
- Track ADA compliance.
- Complies with State Mandates and revisions to state laws.
- Track funds set aside for Capital Improvement Projects.
- Capture newly identified need for capital improvements (“Parking Lot”).
- Space Program (Space availability).
- System requirements:
  - Web enabled.
  - Support Web Services.
  - Support responsive design.
  - Dual factor authentication for public facing interface and portal(s).

Reports

- Property Management Reports.
- CPI Calculations.
- Monthly Maintenance Expenses.
- Monthly Rent/Lease Payments.
- Utility tracking/payments.
- All properties Owned by the City, inventory of city holdings.
- Commercial Oriented Reporting.
- Ad Hoc Reporting.

Interfaces

- Tyler Munis.
- GIS (owned and leased property data).
- Facilities Work Order (CMMS EAM).
- Laserfiche or equal, e.g., Box, cloud-based document storage.

Benefits:

- Enhanced revenue generation.
- Improved efficiency by staying on task.
- Enhanced tenant satisfaction.
- Improved tenant perception of the City.
- Improved customer experience.
- Easy access to information when needed.
- Better access to information addressing questions.
- Better and faster customer response.
- Internally, allow staff to be proactive instead of reactive.

- Lease management information in one system will foster better planning.
- Allow City to better leverage available properties.
- Provide ability to offer potential tenants leasing opportunities/options.

D SW 7 IT Service Management Software [ITFG 2]

Findings:
The IT Focus Group with ISD staff revealed the existing IT Service Management Software (ITSM) solution is old, the vendor may not be around long term. This applies to Novell Service Desk (NSD) and Novell products in general. The existing system is very manual and cumbersome. This results in:

- Potentially, future support could be questionable.
- If NSD goes down, it will impact processing tickets.

Recommendations:

- Explore and assess other software and vendors.
- Explore a more comprehensive solution that includes Project Management, Portfolio Management, etc.
- Carry out a formal requirements definition and solicitation process, looking at what the marketplace has to offer.
- Identify associated ISD staffing requirements.

Benefits:

- Enhanced customer services.
- With workflow, tickets could be directed to the appropriate staff to respond to them.
- Could improve automation of tickets.
- Could get more utilization, and help the ISD centralization effort.
- Improve workflow between teams if workflow were better planned.

D SW 8 Mobility Device-to-Device Data Transfers [ITFG 2]

Findings:
The IT Focus Group with ISD staff revealed the cell phone transfer of files is challenging. High-profile users that need to back up or restore text messages, use a third party, manual process and hardware solution. This results in:

- Staff need to keep logs of calls with other users, and external persons.
- ISD is not able to provide the desired level of customer service to mobility users.

Recommendations:

- Explore options, e.g., an automated system with an adequate security profile.
- Find an easy, secure third-party hardware solution for device-to-device data transfers.

Benefits:
- Eliminate manual processes, copying and moving content quickly.
- Staff time savings.
- Eliminate delays.
- Improved customer satisfaction.

D SW 9 Device Management Software [ITFG 2]

Findings:
Use Zen Works (MicroFocus) product for managing desktops, there may be some risk of availability of the product over the long haul. It's a good product but it's very mature. Aging imaging and desktop managing infrastructure. [Implemented circa 1998, optional systems include: SCCM, InTune, etc.] This results in:
- IT staff have to find another way to manage desktops and applications.
- IT staff have to identify and reimage every desktop.
- Have looked at some options, some install files are very old.

Recommendations:
- Implement Device Management Software.
- Explore a better way to manage and image machines, including improved windows imaging processes, to take advantage of new systems.
- Do a requirements collection.
- Issue an RFI to explore what options exist.

Benefits:
- More vendor support.
- More community support.
- From a staff deployment and customer impact, the system will be reliable for the long term.
- Better meet customer needs.
- Get a strategic solution.
- Better training resources for staff.
- More efficiencies in deploying and managing new systems.
- Help stay consistent with applications, contemporary enterprise grade application.

D SW 10 Internal Investigation Management Software [RW 1]

Findings:
The Rapid Workflow® business process workshop with the Police Department related revealed the current internal investigation management system needs to be upgraded. This results in unnecessary delays and potential oversights.

Recommendations:
- Contemporary internal investigation management software:
  - Manage and track internal investigations.
  - Pursuit packets.

- Use of force.
- Triggers early alert systems.
- Tracking complaints.
- Create reports.
- Analytics.

Benefits:

- Ability to efficiently respond to PRAs and manage misconduct workflow.
- Have good records on any trend.
- Maintain public trust.

D SW 11 National Transit Database [RW 8]

Findings:

The Rapid Workflow® workshop with Transportation & Fresno Area Express revealed the existing Excel spreadsheet is large. There are many different and complex formulas in the spreadsheet. There are many different systems (approx. 11) staff have to access to gather the data. Currently, staff are copying and pasting data that is produced from the reporting system into the Monthly Statistical Report. Some systems are cumbersome to use on their own. The age of some systems is an issue as well. This results in the following:

- It takes a long time to open, close, and do things within the spreadsheet, and can cause the computer to freeze often.
- Makes spreadsheet large and hard to use.
- Any little mistake within the formulas can mess up a lot of things up.
- At the end of every fiscal year, staff have to change the formulas. This takes up a lot of time and is cumbersome.
- The existing process/systems is very inefficient.
- Cumbersome every time staff train a new person because they have to make sure the new person has access to all systems and know how to use each one.
- Have potential for missing data if front users are not taking the time to enter data as needed.
- Potential for systems to breakdown.

Recommendations:

1. Implement National Transit Database Applications
   - Implement a database application interfaced to existing systems.
   - Investigate existing off-the-self applications or the development of a custom database application.
   - Provide the ability of the NTD application solution to automatically read in required data from existing systems.
   - Provide the ability to classify different categories of data by end users and by MA II (not IT staff).
   - Provide appropriate levels of security rights and privileges.
   - Incorporate cyber security measures.
   - The design development and deployment will be done in partnership with ISD.

- Web enabled solution.
- Support responsive design.
- Dual factor authentication.
- Single sign on with AD.

2. Provide appropriate formulas and v look-ups (look through datasets and pull-out corresponding data, allowing for 'if and then' statements.
3. Provide the ability to produce an annual fiscal year to date summary of the data needed for NTD reports or forms.
4. Provide a dashboard.

Reports

- Ad hoc reports, for instance:
  - Ridership
  - Mileage

Benefits:

- Staff time savings.
- Mitigate the risk of Microsoft changes.
- Mitigate the risk of end users changing the Excel formulas, and breaking them.
- Data can be made accessible to others with only viewing rights and no ability to change it.
- Ease of use.
- Could ease funding.
- Reduce system problems.

D SW 12 Legal Contract Management Software [RW 14]

Findings:

The Rapid Workflow® business process workshop with General Services Airports, City Attorney related to legal/contract management applications revealed the following:

1. There is no communication between Risk Management and City Attorneys, which results in:
   - Staff stress.
   - Delayed documents.
   - Staff time to follow up.
   - Pushes back projects.
2. City staff have to have multiple follow ups to ensure project is moving along, or determine the status of the project with Risk Management, which results in:
   - Staff stress.
   - Delayed documents.
   - Staff time to follow up.
   - Pushes back projects.
   - Poor reflection on City department by customers and tenants.
   - Poor customer service.

3. There is no workflow communication with City Attorney's Office and who may have been assigned the agreement, which results in:
   - Staff not knowing who to contact for a follow-up.
   - Hard to track progress.
4. There is lack of standards on how to submit documents to City Attorney's Office, which results in:
   - Staff time.
   - Staff stress.
   - The possibility of having to resubmit.
5. Property Managers are not notified if there is an issue with the Staff Report in the Granicus process, which results in possibly missing deadlines.
6. City staff have to remind tenants to execute the agreement, which results in staff time.
7. Reminding the Clerk to sign agreements, which results in staff time.
8. There is constant follow up on tenants and tenant insurance, which results in staff time and staff stress.
9. Managing email is a challenge, which results in staff time and staff stress.
10. There is a lack of Agreement version control, and incorporating City Attorney and Risk Management comments, which results in staff possibly working on the wrong version of an Agreement.

Recommendations:

Legal / Contract Management Application

Features & Functions

- Ability to assign and reassign the Agreement.
- Allow one entity to modify an Agreement at a time.
- Version Control: next reviewer has to save as a new version to make revisions.
- Allows viewing revisions made, by whom, and timestamped.
- Task assignment and tracking.
- AI-based document analysis.
- APIs, apps and add-ins.
- Configurable site dashboards.
- Workflow automation:
  - Provide staff Task Lists.
  - Shared Work Lists.
  - Auto email notifications once Agreement has been viewed and marked up.
  - Auto notifications of updates.
  - Auto reminders triggered by transmission of DocuSign email, or Contract Management software auto notifications:
    - Tenant.
    - City Attorney.
    - Risk Management.
    - Clerk.

- Ability to check the status and workflow.
- Data visualization.
- Document management.
  - Customizable content metadata.
  - File storage and sharing.
  - Internal users and storage.
- Security options.
- Optical Character Recognition.
- Defined projected timelines.
- Shared team calendars.
- Smart forms and data sheets.
- Social collaboration.
- Solution templating.

Process Recommendation:

- ISD should be considered a stakeholder in this process. Contracts or procurements often require ISD approval and input, added to the following stakeholders who are involved in assuring a contract is "good to go":
  - Purchasing
  - City Attorney's Office
  - Risk
  - ISD

Benefits:

- Faster work product.
- Quicker response time.
- Streamlined process.
- Reduce staff stress.
- More staff work time.

ISD should be considered a stakeholder in a system like this, since ISD approval is required on all contracts that involve technology and we would benefit from being involved in this system. Purchasing should also be a participant.

D SW 13 Construction Bid Software [RW 17]

Findings:

The Rapid Workflow® business process workshop with General Services Airports, Construction Bid revealed the following:

1. Staff are not familiar with Tyler. There is a lack of training (did not revive sufficient training, fundamentals only). “Learn as you go” was the approach. This results in:
   - Staff frustration.
   - Reliance on others to assist.
   - Not making the best use of the Tyler system.

2. Cannot find the boilerplate, which results in:
   - Mistakes are made.
   - Might use the wrong boilerplate.
   - Taking more time.
3. Purchasing and Risk Management take a long time to review (2 weeks), which impacts the ability to get the project done and could impact ability to get funding for a project.
4. Staff are using Outlook as the workflow engine, which results in:
   - Inefficiency.
   - Staff time and the work it takes to manage emails.
   - Space to store multiple emails and content.

Recommendations:

- Provide training, role based tailored to this business process.
- Have Purchasing advise Airport staff of updates to boilerplate documents.
- Store boilerplates documents in a central, accessible place.
- Ensure documents are maintained, with version control.
- Store these documents in the City's primary document management system.
- Policy & Process change: adopt a concurrent, review process, Purchasing, Risk, CAO.
- Adopt workflow automation.

Benefits:

- Alleviate staff frustration.
- Improve staff efficiency.
- Could find boilerplate fast and easily.
- Improve project delivery time.
- Streamline the process.
- Help secure funding.
- Carry out projects that serve to enhance safer, more secure airport, and improve the passenger experience.

D SW 14 SB 1383 Reporting [MI 21]

Findings:

The Management Interview with DPU, Solid Waste revealed that under Senate Bill 1383, Organics Collection and Diversion, cities can no longer land fill organics. Food scraps must be collected and processed at organic processing facilities; collection of edible food recovery. Supermarket food has to be donated to other organizations, creating a monitoring, reporting and record keeping challenge for the State, specifically the requirements for SB 1383, an unfunded mandate.

Recommendations:

- Carry out a formal requirements definition of functional and technical requirements and performance specifications.
- Carry out a formal procurement process to see what the marketplace has to offer.
- Implement an application to meet the reporting requirements of SB1383, including:
  - Incidents
  - Inspections
  - Commodities
  - Contamination
  - Outreach
  - Education

Benefits:

- Effective monitoring and reporting
- Compliance with State requirements

ESW Enterprise Software

Enterprise Software denotes applications used by all departments, by all key departments, or many departments across the City. An enterprise technology vision, which the ITSP Roadmap proposes, typically adheres to the following:

- Enterprise software benefits several business units across the organization, taking advantage of economies of scale
- Enterprise software pools financial resources from one or more business units or departments to procure systems that otherwise might not be affordable by one business unit
- Voids the purchase of technically disparate systems that provide the same functionality
- Procures systems that meet an Enterprise Architecture and established technology standards to minimize operational costs and maximize investments in technology
- Decreases the overall workload on IT staff by not having to provide technical support on numerous redundant applications or applications that do not meet the City's standard Enterprise Architecture or standards. (This requires ISD governance capacities to limit the growth of disparate software and take steps to consolidate department software into standards.)
- Typical enterprise applications include ERP Systems (e.g., financial, human resource, work order, procurement, asset management applications, etc.), Enterprise Content Management Systems, and Geographic Information systems

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ESW 1 GIS

ESW 1.1 One GIS Portal [ITFG 4]

Findings:
The GIS Focus Group with ISD revealed a duplication of effort in several departments related to GIS, e.g., IVIEW and GIS Toolbox. There are different web applications built with the same data, probably 80% is the same data, and the rest is specialized data. This results in:

- Customized webapps built for departments, that could be used by more folks.
- Time and effort maintaining multiple systems.
- If data is not sourced from the same location, staff may see different data.

Recommendations:

- Implement one GIS site that everyone at the City can use for city-wide data.
- Provide one portal to remove the spatial data overlap, centralize shared datasets and govern, that process through change control.
- Work together as a city-wide GIS organization to track data, maintain metadata, and data maintainers in Teams to reduce duplication of effort.

Benefits:

- Less confusion between data and departments.
- Fewer software resources spent and used.
- Free up staff resources, not doing duplicate work, and being able to focus on remaining workload frees up storage space by not having duplicate files.

ESW 1.2 GIS Utilization [ITFG 4] [MI 17]

Findings:
The GIS Focus Group with ISD revealed there are processes and data that have been around for 30 years, that require software that is that old, including servers. The City has not clearly identified what is obsolete. This results in the following:

- Extracting the data is time consuming, difficult, and meticulous.
- Software becomes unsupported.
- Difficulty in recruiting staff, because new recruits are looking for current up to date software.
- Sometimes this work has to be done manually, which takes staff time.

Recommendations:

- Carry out an assessment across departments to see who is using what, plan the move to the new system, develop a plan and decommission the old system.
- Make sure GIS is considered in the procurement processes when new software is procured and implemented, for instance, new CRM software.
- GIS Specialist(s) should be in the discussion when business processes are discussed, to make sure the GIS workflows and data needs of the department are being met.

- Alignment with leadership expressing that GIS participation should take place with major procurements. (GIS Master Plan, IT Governance.)

Benefits:
- Reduce cyber vulnerability, enhanced security.
- Easier recruitment of new staff.
- Better workflows.
- Better external integration.
- Reduced time for creating other solutions.

ESW 1.3 GIS Data Consolidation [ITFG 4]

Findings:
The GIS Focus Group with ISD revealed data introduced by various sources/departments is not up to date. This results in:
- Workflows may use old software and data, may not be able to be kept up to date.
- Out of date data impacts all departments and the public: when people come to get a permit, it delays the process.
- Errors and decisions are made because data is not correct.

Recommendations:
- Additional contact information at the department level.
- Consolidate data into one system of truth.
- Document workflows and business processes, provide it new hires.
- GIS Data Consolidation.

Benefits:
- Happier citizens.
- Quicker more accurate services.
- Improved customer experience.
- Limit confusion for both the customer and GIS specialist.

ESW 1.4 GIS Standardization [ITFG 4]

Findings:
The GIS Focus Group with ISD revealed that in many cases employees are using software that is not standard (or obsolete) for GIS, or current best practices, e.g., not using ArcGIS Utility Network, and instead are using AutoCAD and home-grown integration to move data back and forth. The integrations can grow obsolete. Government is typically years behind the private sector when updating hardware and software. This results in:
- Difficulty in recruiting staff, because new recruits are looking for current up to data software.
- Creates the appearance of not taking care of staff and the tools they need.
- Produce data sets that may not be compatible with industry standards.
- Difficulty in integrating with other enterprise systems.

Recommendations:

- Invest in standardization by keeping up to date software/hardware e.g., maintaining utility network in AutoCAD versus converting to ArcGIS Utility Network
- Utilize the esri Enterprise Agreement, which includes professional services.
- Determine what needs to be addressed: allocate resources to do all of the work.
- GIS Standardization.
- Maintain an emergency software allocation budget for potential unforeseen necessary expenses, e.g., LIDAR.

Benefits:

- Budget savings, spend less time to create solutions on the back end.
- Staff time savings by not maintaining two systems of records.
- Make it easier to interface with other systems, e.g., Asset Management, Work Order systems. A fully geometric network would allow analysis of downstream effects of decisions.
- Improved recruitments.
- Enhanced data integrity.
- Improved workflows.
- Reduce cyber vulnerability/enhanced security.

ESW 1.5 GIS Web-based Tools [ITFG 4]

Findings:

The GIS Focus Group with ISD revealed there is little to no non-GIS City end user staff training available on how to use GIS. This results in:

- GIS Specialist spending time doing tasks that could be done by end users.
- Produces bad/incomplete/or subpar data.

Recommendations:

- Provide GIS Web-based tools to non-GIS end users.
- Standardize a training plan for new employees.

Benefits:

- GIS could be improved/produced without burdening GIS Specialist.
- Reduce the amount of time spent answering similar questions.

E SW 2 Customer Relationship Management Software (CRM) [RW4] [MI 3]

Findings:

The Rapid Workflow® business process workshop with the Economic Development Department revealed there are processes and data that have been around for 30 years:

1. Duplicate data entry into Excel and Teams, resulting in loss of staff productivity and staff stress.
2. Missing information: Data entered and then deleted and missing data in the Excel CRM, resulting in:

- Wasted staff time.
- Unfilled data fields.
- Removes viability of reporting information, if staff cannot populate enough information for reporting.
- Incomplete reporting.

3. Undefined methodology and business process, resulting in:
   - Loss of staff productivity.
   - Staff stress.
   - Impacts reporting.
4. Lack of a simple business process for staff engagement, resulting in:
   - Loss of staff productivity.
   - Staff stress.
   - Impacts reporting.
5. Manually exporting data from Implan software to Excel CRM (the run takes 30 minutes), resulting in:
   - Loss of staff time
   - Lose data in transfer.
     - Implan takes 30 minutes, cutting and pasting takes a minute, but there is a possibility to lose data or mis-record data.
6. Lack staff training, resulting in:
   - Loss of staff productivity.
   - Staff stress.
   - Unfilled data fields.
   - Removes viability of reporting information, if staff cannot populate enough information for reporting.
   - Incomplete reporting.
7. Lack of central storage place for information (files are stores on Shared Drives, network drives, PCs, anywhere), resulting in:
   - Inefficient, no database to go to.
   - What data is pulled to not be consistent or not pull proper data.
   - Hurts staff succession.
8. Inadvertently deleting information, resulting in:
   - Loss of staff productivity because of having to go back and research.
   - Affect reporting negatively.
   - Staff stress.
9. Lack standard taxonomy for shared drives, resulting in:
   - Inefficient, no database to go to.
   - What data is pulled to not be consistent or not pull proper data.
   - Hurts staff succession.
10. Time consuming to run report manually, in CRM and Teams, resulting in:
    - Staff time: for weekly report, an hour and half a week, quarterly 3 days to consolidate information.
    - Staff succession.

11. Excel CRM is manually driven vs. using contemporary automatic workflow features, resulting in:
    - Staff time: for weekly report, an hour and half a week, quarterly 3 days to consolidate information.
    - Staff succession.

Recommendations:

Customer Relationship Management (CRM) System

Features & Functions

- Provide ability to configure permissions with appropriate access rights and security privileges.
- Provide data validation.
- Provide workflow capabilities:
    - Routing docs/information
    - Reviewing
    - Auto notification emails
    - Auto notifications
    - Tracking
    - Status checking
    - Automatic reminders, e.g., reminders or notifications to coordinators when follow up should be done
    - Auto escalation
- Centralized storage with a standard taxonomy.
- Dashboard:
    - Dashboard showing timing
    - A robust solution, flexible and easy to use to manage projects by 4 main practice areas.
    - User friendly, easy, fast for ends users.
    - Manage requests/complaints from any type of customer including constituents, departments, or Council.
    - Manage the entire process including internal, customer and third-party interactions.
- Assign Economic Development Event Coordinators to leads and referrals.
- Record customer testimonials.
- Provide categories/menu: linking to subject matter experts.
- Provide a database of project history.
- Provide internal request capability.
- Completed actions.
- Tracking staff time.
- Web enabled application.
- Support mobile devices.
- Support responsive design.

Reports
- Weekly Report: project data for industry type, economic impact, location.
- Canned reports.
- Ad hoc reports.
- Reports that can be run without the assistance of IT staff.
- Dashboards.
- Quarterly Reports.
- Annual Reports.
- Staff Performance Reports.

Interfaces
- Explore an interface from Implan to new CRM, e.g., using APIs.
- Accela.
- GIS.

Benefits:
- Increased capacity for the department to handle additional projects.
- Improve staff life.
- Reduce staff stress.
- Better reporting.
- Better efficiencies.
- Increase capacity for department.
- More trust in the system/reliability.
- Greater efficiencies.
- Staff time savings.

E SW 3 Grants Management Software [MI 5]

Findings:
The Management Interview with Finance revealed the need for grants management software. The City intends to use the Tyler Grants Management module.

Recommendations:
- Carry out a formal requirements definition of the Grants Management process, functional and technical requirements, with performance specifications addressing related reporting, interface and data migration specification in advance of the deployment of the system.

Benefits:
- System configured to meet end user's needs.
- Best use of the grants management software.

E SW 4 Enterprise Content Management Strategy [RW 2, 3, 5, 6] [ITFG 2] [ITFG 3] (MI 2]

Findings:
Enterprise content management was one of the most identified as a challenge in several project tasks, for instance:

- DPU Wastewater Project Planning (2) Rapid Workflow® workshop
- Public Works, Vertical Asset Management Rapid Workflow® workshop
- Software IT Focus Group Hardware and Software
- City Clerk Management Interview

A number of ECMS systems are currently used at the City to store electronic content, at least 7:

1. iManage
2. Laserfiche
3. OneDrive
4. PCs
5. ProLaw
6. Shared Drives
7. SharePoint

Typical city-wide challenges included:

- Lack of a city-wide strategy.
- Lack of Enterprise Content Management best practices.
- Lack of an enterprise taxonomy (document types, document classes, meta data, file naming convention, and folder structures).
- Standard Records Management policies and practices.
- ISD staff time requirements to support multiple system.
- Version control.
- Duplicate storage of content and the cost of disk space, servers, and electricity.
- Wasted staff time.
- Cannot take advantage of economies of scale.
- Inability to meet State mandated Digital Record storage requirements.
- Data classification challenges as it relates to Data Loss Prevention (DLP) policies.

Specific examples from stakeholders are provided below.

E SW 4.1 DPU Wastewater Project Planning (2) Rapid Workflow® Workshop

Findings:
The project planning business process workshop revealed a lack of document version control and consistency, sending documents back and forth for validation, and inconsistent naming conventions resulting in wasted staff time and inefficiencies.

E SW 4.2 Public Works, Vertical Asset Management Rapid Workflow® Workshop

Findings:
The vertical asset management process workshop revealed issues with document version control and the lack of consistency. Staff are sending documents back and forth for validation and the naming conventions used are inconsistent resulting in wasted staff time and inefficiencies.

E SW 4.3 Software IT Focus Group

Findings:
The IT Focus Group software workshop revealed the City does not have consistent Electronic Content Management Systems (ECMS) or practices across all departments, e.g., Laserfiche, ProLaw, etc. The Laserfiche deployment was originally led by ISD, then Public Works, and the Clerk adopted it. An enterprise taxonomy (a best practice) was never developed or adopted in the Laserfiche system. This has resulted in struggles in some departments implementing their own niche systems, support challenges, and a lack of economies of scale.

E SW 4.4 City Clerk Management Interview

Findings:
The management interview with the City Clerk revealed an interest in implementing permanent digital records practice, bringing a resolution to Council.

City-wide Recommendations:
Enterprise Content Management Systems are true enterprise systems, similar to a finance system, e.g., each department does not implement its own finance system. In a perfect world, a city would have one ECMS, however, for a number of reasons, this is not practical. However, an enterprise document and records management strategy should be articulated and implemented, as describe below:

- Develop a comprehensive Enterprise Content Management Strategy and Roadmap including:
  - ECMS policies, procedures, and practices.
  - Digital records management practices in conformance with California state requirements.
  - Enterprise Taxonomy.
  - Define how various systems will be used, and what content they will store.
- Implement a centralized repository with the following hierarchy: division, departments, and citywide document types and classes.
- Adopt version control system features, policies and practices.
- Articulate and adopt clear ownership responsibilities of document management systems: system platforms, application software, and electronic content.
- ISD acquire staff with expertise with document management, workflow automation, records management systems.

Benefits:
- Enhance document and records management practices.
- Improved ability to support ECMS.
- More specialized knowledge of these systems.
- Improved efficiency.
- Improved knowledge of where information is stored.
- Reduced liability.
- Improved project delivery.
- Improved staff morale.
- Improved version control.
- Reduced staff stress.
- Enhanced records management practices, records dispositioning.

E SW 5 One Drive

Findings:
There are issues managing user personal data, and it is continuing to grow. Users are storing personal data on city networks: photos, videos, shareware, downloaded files etc. This results in:
- Exposes the city to liabilities.
- Personal data is growing, and being stored on city servers.

(CSD is working to establish a tool for backing up OneDrive/SPO data, taking it out of the Azure environment and storing it in a different cloud environment.)

Recommendations:
- Set up One Drive as the replacement for home drives, which offers the ability to data match for patterns, flags some items as concerning, or data that should not be stored in those locations. Block inappropriate data storage or notify ISD.
- Provide staff retraining to not store personal data on City resources.
- See recommendation above.

Benefits:
- Reduce overhead locally.
- Reduce liability by addressing the issue.
- Improved staff behavior.

E SW 6 **iManage Standard Procedures** [RW 12]

Findings:
The Rapid Workflow® business process workshop with the City Attorney revealed an iManage document management system was recently started and is ongoing in this department. The migration from the Windows Explorer-based file structure to iManage poses a challenge, which impacts staff processing assignments.

Recommendations:
- Ensure the iManage taxonomy accounts for all documents and document types currently stored on Shared Drives.
- Provide sufficient oversight in the transition from the Windows folder structure to the iManage folder structure.
- Develop written standard procedures for migrating documents from Shared Drive to iManage.

Benefits:
- Reduced delays.
- Better time management.
- More time to concentrate on the assignment itself.

E SW 7 SharePoint - MS 365 Strategy [ITFG 3]

Findings:
SharePoint, have a hybrid of old and new: On-prem SharePoint and Cloud. On-Premise system is not integrated with Microsoft 365. This results in:
- Creates data silos and disparate systems, in different environments, where staff have to work separately.
- Internet SharePoint is a bit outdated.

Recommendations:
- Upgrade the local SharePoint servers.
- Go to SharePoint online. (There is significant unused storage there.)
- If use MS 365, migrate to 365 Exchange (a policy).
- See recommendation above.

Benefits:
- Have the opportunity to have SharePoint up to date.
- Security benefits, Internet Explore would no longer be required.
- Make use of the investment. (SharePoint – MS 365 Strategy).

E SW 8 Access & MySQL Databases [ITFG 3]

Findings:
(Usually unknown) Access and MySQL databases appear in City environments, e.g., Public Works database, Project Tracker. This results in:
- Older versions of Access cause applications to fail.
- Users are creating their own databases.
- Do not know who is sharing data.
- Home grown databases could become a problem when interfacing to other applications.
- These databases are easy to copy and walk out with it, there is the potential for data loss and theft.

Recommendations:
- Identify portfolio of access database, including undocumented and unsupported database. Determine which can be retired and/or replaced with SQL Server.
- Developed replacement schedule.
- Upgrade SQL Server.
- Meet end user needs, as fast as possible.

Benefits:
- Standardized support.
- Better knowledge of what the environment is and the types of applications are being run, and better monitoring.
- Proper backups and security.
- Enhanced version control.
- Enhanced concurrency.

ESW 9 Up-to-Date Version of SQL [ITFG 3]

Findings:
Have over 200 databases on 2012 and other outdated versions of SQL Server. This results in:
- Some servers are out of support from Microsoft.
- Security concerns.
- If issues are something beyond what ISD staff can handle, there would be no support from Microsoft.
- No patches for new vulnerabilities that come out.

Recommendations:
- Get latest edition servers.
- For specific or multiple departments, get departments or associated vendors on board with upgrading the databases, or obtain a confirmation that database issues will not interfere with the application.
- Move to an up-to-date version of SQL.
- Test the upgraded version.
- Move to the highest database version the application(s) will accept.

Benefits:
- Everything would be in compliance.
- Up to date with latest features.
- Offer core functionality.
- Easier for ISD to support.
- Reduce core count costs by combining servers.

W Web

W 1 Laserfiche Public Portal [MI 2]

Findings:
The Management Interview with the City Clerk revealed a need to distribute digital copies to the public via a portal. They have Laserfiche now, but it is not without its problems and challenges. The City Clerk cannot currently make up their own templates or folders, and when there are issues, have to contact ISD for resolution.

Recommendations:
- Explore City Clerk staff administering Laserfiche for their department needs, the Clerk has the staff to do this.)
- Adopt the practice where the City Clerk has the ability to make up their own templates or folders.
- A lot of departments have gotten rid of their workflows e.g., Finance system, so perhaps the Clerk can assume ownership of Laserfiche. (ECS is their Laserfiche vendor.)

Benefits:
- Ability to update public information almost in real time
- Would eliminate the need to contact ISD staff when there is an issue.
- ISD staff time savings.

I Interfaces

Findings:
The ITSP project revealed the City has a number of applications requiring interfaces.

I 1 Accela FresGo with Infor Asset Management [MI 22]
The Management Interview with the Public Works Director revealed the need to maintenance customer system interface FresGo and the Asset Management System (INFOR).

I 2 Account4 – 10X-10C System [ITFG 2]
The ISD Focus Group revealed duplicate data entry by staff into these systems when adding new accounts within Account4, which results in:
- Human error for data entry.
- Requires more audits to ensure data entries are correct.
- More time to build a report to find list of all devices and relative departments.

Recommendations:
- Interface Account4 and 10X-10C System to pull data from 10X/10C Ticketing system, including the ability to pull reports of all data.
- Allow Account4 to pull existing data from 10X/10C system for new entries with the connection of 10X/10C ticket number.

- Add new feature to export report from Account4.

Benefits:
- Removes human error from data entries.
- Removes time for data entries.
- Removes time consumed to build custom report for all City devices.

I 3 EAM/EIMS Integration [RW 3]

The Rapid Workflow process workshop with Public Works for vertical asset management revealed the integration of documents from EIMS to EAM is not an automatic upload. This results in:
- This currently has to be done manually.
- Staff and process inefficiencies.
- Staff frustration when information is not available.

Recommendations:
- Have documents or data transfer automatically.
- Adopt workflow automation for this process.

Benefits:
- Improves staff efficiencies, because they have what they need and do not have to go find documents.
- Improved safety.
- Improved staff morale.

General Interface Recommendations:
- Carry out a detailed assessment of existing systems interfaces (which was beyond the scope of the IT Strategic Planning engagement).
- Identify detail system interface specifications with subject matter experts, including source and target system, one or bi-direction interfaces, data types and interface method: Query, Batch or Real Time data access.
- Identify system interface requirements and include interface specifications for ISD staff, software vendors or systems integrators.

Benefits:
- Customers will only have to enter data once.
- Improved customer experience.
- IT staff time savings.
- Improved data consistency and integrity.
- Cost savings.

4.2.2 Operational Recommendations

The area of operational sustainability relates to the IT organization's ability to provide the complete spectrum of services required to effectively and successfully meet the technology needs of the City and public. Issues related to sustainability include the use of professional best practices commonly found in IT organizations committed to providing exceptional customer service.

The following findings and recommendations are based on input gathered throughout the ITSP project related to sustainability.

O IT Operational Recommendations

O 1 Best Practices [ITFG]

Best practices encompass methods, procedures or techniques that have been shown by research, experience and application to produce optimal results; they establish a standard suitable for widespread adoption. Best practices become generally accepted as superior to non-standard alternatives because they produce consistent and predictable results.

In the area of Information Technology, best practices ensure that every phase of the technology lifecycle is executed successfully. This applies to systems planning, requirements, definition, evaluations, selection, implementation, integration, development and project management. For IT organizations, it applies to proper resourcing, operations and service delivery. IT best practices significantly mitigate risk, ensure technology is responsive to organizational needs, fosters the effective use of emerging technologies, and provides the highest return on investment.

A number of IT operation best practices were addressed in the IT Operations Focus Group with IT staff, revealing the following challenges.

O 2 Requirements Definition Method [ITFG 5]

Findings:
The IT Focus Group with ISD revealed the IT requirements are not done in a consistent manner, in developing an understanding of internal technical and functional requirements of stakeholders. This results in:

- Requirements come down to whatever the end user they are talking to thinks that means.
- Software gets approved, or discussed, outside of the IT organization.
- Informal data collected cannot be included as technical requirements in RFPs.

- Incomplete functional and technical requirements can result in scope creep.
- Software acquisitions are not fully specified and/or planned out prior to procurement.
- Poorly defined functional and technical and poorly structured RFP documents.
- IT solutions that do not meet business needs.
- Software is implemented without an understanding of what it will take ISD to support it.

Recommendations:

- Adopt a standard IT project request intake template.
- Adopt a best practice requirements definition methodology and process that produces a performance specification addressing the following:
  - Functional and Technical Requirements Specifications.
  - Report Specifications (if applicable).
  - Data Migration Specifications (if applicable).
  - Interface Specifications (if applicable).
  - Implementation Plan.
  - Scope of Work.
- Incorporate requirements definition into the first step in the IT Governance process articulated in the ITSP project.
- Provide requirements definition training to appropriate ISD staff, e.g., Business Analyst, Project Managers.

Benefits:

- Produce well defined requirements up front instead of after the fact.
- Could allow stopping the process before it gets too far down the project.
- Requirements custom tailored to end user business and service delivery needs.
- Better vendor proposals, responsive to technology performance specifications.
- Enhanced technology implementations.
- Improved project delivery.
- Cost savings via reduced change orders on IT deployments.
- More satisfied end users and public customers.

O 3 Project Management & Project Portfolio Management [ITFG 5]

Findings:

The IT Focus Groups revealed the lack of an ISD Project Management and PMBOK standards are not used across the board. ISD lacks Portfolio Project Management practices and software. This results in a number of adverse outcomes:

- IT does not have any single location to determine the exact number of projects it has at any given time, which inhibits resource allocation planning.
- Projects not being managed in a consistent manner across City departments
- Projects tend to take longer because they are not properly managed.
- Reduced resources and many projects, results in staff being spread out too thin.
- Unpredictable project outcomes.

- So burdened with project with competing priorities, vs. best time to value or more impact to the organization – which come at the mercy of operations. Leave the project and come back to it later.
- Additionally, ISD is often not considered a project stakeholder.
- ISD lacks a high-level project dashboard and is unable to track important project metrics.

Recommendations:
- Provide project management essentials training to ISD staff.
- Establish ISD project management standards.
- Adopt Portfolio Project Management practices and software.
- Adopt standard templates, e.g., Project Intake Form, aligned with the IT Governance recommendations in this document.
- Establish and staff an ISD PMO with sufficient resources to carryout requirements and project management.

Benefits:
- Improved project delivery.
- Ontime project completion.
- Better service delivery.
- Reduced staff stress.
- Better life balance.

O 4 Video Lifecycle Management Replacement Plan [ITFG 1]

Findings:
The IT Focus Group on infrastructure with ISD revealed the age of components of the Police video system is a single point of failure. This system has never been properly funded, which results in:
- Reliability of video feeds.
- Staff time to support equipment.
- On the services end, there are request for video feeds that can't be met due to diffusion of staff across multiple other responsibilities.

Recommendations:
- Properly fund and design the video system, to not have single point of failure.
- Develop a Lifecycle Management Plan and funding plan.
- Establish a more robust highly available architecture, in line with the business needs of the system.

Benefits:
- Improved security, via reliable camera system.
- Used for identifying and taking action on a variety of events.
- Improved Public safety.

O 5 Network Infrastructure Replacement Plan [ITFG 1]

Findings:
The IT Focus Group in infrastructure with ISD revealed that components of the network are at or near end of life. Critical hardware has been, or is being, modernized, however a more comprehensive plan, is need to assure effective lifecycle management.

Recommendations:
- Develop and adopt a Switch Replacement Plan.
- Develop staff size and capabilities to support the infrastructure.

Benefits:
- Improved security.
- Improved reliability.
- Improved throughput.

O 6 Generator Replacement Schedule [ITFG 1]

Findings:
The IT Focus Group on infrastructure with ISD revealed the equipment is aged and not all critical sites have generators. This results in service loss due to power loss and equipment failure.

Recommendations:
- The replacement generator at MSC has been delayed for years.
- Complete the generator/power upgrade project at MSC.
- Provide more equipment where needed:
  - Radio sites: 2 sites.
  - FD/PD: 5 substations.

Benefits:
- Increased reliability.
- Expansion of UPS: improved uptime.

O 7 Email Exchange Policy [ITFG 3]

Findings:
The IT Focus Group on software with ISD revealed an existing policy requires ISD have an on-premise MS Exchange email server, which is not integrated with MS 365. This results in:
- Inability to fully integrate with, and make full use of, Office 365 investment.
- Inability to use Power Automate with Exchange.
- Inability to use Outlook To Do.
- Can't take advantage of all available benefits.
- Using a significant amount of server resources for Exchange.
- Processing about a TB of email nightly, will grow to 10 Tb in the near future.

Recommendations:
- Need to look at what the City will use in the future, reduce retention.
- Will have to retain email data in email in a data storage system, which needs to keep attributes, for E-discovery.
- Articulate and adopt a methodology.
- Provide staff training on how to use links to a shared file in SharePoint Online.
- Email Exchange Policy.

Benefits:
- Free up system resources that can be overtaxed at times.
- If not tied to City Hall networks, email would still be available in case city hall becomes inaccessible.

O 8 GIS Templates & Best Practices [ITFG 5]

Findings:
The IT Focus Group on IT operations with ISD revealed staff have a hard time knowing what the department wide standards are, e.g., Project Management. ISD staff follow PMI but not across the board. ISD and IT staff are seen as a service organization -- not a project organization. This results in:
- Projects tending to take longer because they cannot be readily and effectively managed.
- Reduced resources on many projects, results in staff being spread out too thin.
- Unpredictable project outcomes.
- So burdened with project with competing priorities, vs. best time to value or more impact to the organization – which come at the mercy of operations.
- Staff leave projects and come back to them later.

Recommendations:
- Develop department wide acceptable standards, SysApps, GIS, based on project type.
- Develop and adopt the use of standard templates.
- Design the inputs of the project to maximize the output.
- ISD has adopted some standards, i.e., Teams.
- Adopt PM & Project Portfolio Best Practices.

Benefits:
- Improved project delivery.
- Ontime project completion.
- Better service delivery.
- Reduced staff stress.
- Better life balance.

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O 9 Disaster Recovery/Business Continuity Plan [ITFG 5]

Findings:
The IT Focus Group on IT operations with ISD revealed ISD has a DR plan but need to update it and develop a better one. The City has a Continuity of Operations Plan (COOP), it is not being updated, tested or trained on. This results in:

- Have had fits and starts modifying it.
- ISD's ability to respond to a DR issue is limited by the amount of time it can spend preparing and training to respond.

Recommendations:

- Develop, adopt, and test a Disaster Recovery Plan.
- Include policies, processes and procedures to recover and ensure business continuity in regards to technological infrastructure in the event of a disaster, whether man-made or natural.
- Retain a professional organization to develop a Disaster Recovery Plan if City IT staff lack the expertise to develop one. Disaster recovery planning is a subset of a larger process, Business Continuity Planning), and should include planning for resumption of applications, data, hardware, communications (such as networking) and other IT infrastructure.
- The Disaster Recovery Plan should address three key control measures:
  - Preventive measures: controls aimed at preventing an event from occurring.
  - Detective measures: controls aimed at detecting or discovering unwanted events.
  - Corrective measures: controls aimed at correcting/restoring systems after a disaster.
- Integrate with the City's EOC function.
- Coordinate with Public Works.
- Adopt a formal Service Level Agreement (SLA) so IT can get Public Works engaged with a sense of urgency in an SLA.
- Explore utilizing the Cloud as a backup disaster recovery site.
- Verify, test and validate the DR Plan on a yearly basis to ensure its effectiveness and efficiency for recovery of City operations.
- Assure DR plan is updated to reflect all the totality of IT resources for which IT is responsible.

Benefits:

- Avoid down time.
- Prompt recovery from disaster.
- Enhanced business resumption.
- Improved business operation efficiencies by avoiding manual work arounds.

4.2.3 Management Recommendations

This section of the report includes management recommendations designed to support the implementation of the City's ITSP Roadmap over the next 5 years. Management recommendations are based on information gained from a thorough review and assessment of the City's mission, business processes, and requirements. An understanding of the City's IT management issues was realized by holding interviews with all department heads, It Focus Groups, an Online Staff Survey and Rapid Workflow® process workshops.

M Management Policies

M 1 IT Governance [ITFG 1] [ITFG 3] [ITFG 4] [ITFG 5] [MI 23]

IT Governance best practices are used by local government to implement business controls for the definition, justification, selection and procurement of Information Technologies. It promotes the adoption of processes, policies, practices, with clearly defined roles and responsibilities for the planning, specification, justification, approval, and purchasing of IT products and/or services. The lack of IT Governance can produce a number of challenges, as articulated in the examples below.

M 1.1 Infrastructure IT Focus Group Findings

Findings:
The Infrastructure IT Focus Group with ISD staff revealed Departments are purchasing systems on their own and putting equipment on the network that should not be there; it is not ISD authorized. This results in:

- Major security exposure and equipment connected to the network that has not been properly vetted, or access identified.
- City Departments deploy technology without ISD knowing about it.
- Departments expect ISD to help with/do the implementations without prior notice.
- Technology procured outside the guidance of ISD may not be compatible with technology in place, staff capabilities, existing operations.

Recommendations:
- Implement ISD and City-wide IT Governance process, policies and practices.

M 1.2 Software IT Focus Group Findings

Findings:
The Software IT Focus Group with ISD staff revealed some departments are meeting their own needs by subscribing to their own software, without consulting ISD. This results in:

- Applications ISD is not aware of.
- Security risks.
- Support challenges, when users call ISD for support.

M 1.3 Software IT Focus Group Findings

Findings:
The Software IT Focus Group with ISD staff revealed issues with the ISD application approval process and security issues. The current condition results in:

- Approved and purchased software is not compatible across ISD.
- Could cause unplanned project delays.

Recommendations:

- Adopt a centralized intake place where application requests go through.
- Adopt a formal IT Governance best practice process with the ITSP including department requirement's definition, ISD validation, specifications and business case for management review.
- Adopt an IT Governance process providing business controls on the planning, procurement and implementation of Information Technologies.
- Adopt well-defined roles of all stakeholders' departments, ISD, and IT Governance Steering committee.
- Executive staff establish a formal and simple IT Governance process, supported by articulated policies and practices, as illustrated in the figure on the following page.
- Employ an RFP process wherever relevant, with mandatory requirements definition, functional and technical specifications.
- Enforce the IT governance process and policy.

M 1.4 IT Governance Findings

Findings:
The IT Governance workshop with the City Leadership Team members revealed the following:

- **ISD:** has developed a series of Administrative Orders, processes, and internal policies addressing IT Governance. ISD has recognized practices used by IT staff as well. ISD also works with the Purchasing Department, in the form of common procurement practices. ISD has been working on an Admin Order for purchasing IT. social media, EA, etc. ISD, in fact, has an IT Governance best practice model in place, including a preponderance of policies and procedures, but not an official IT Governance process.

- **Police Department:** noted that at times they need solutions that are rapid, or outside the box, or what IT has planned. They require an IT Governance that is agile and responsive, and do not want to be hamstringed by the IT Governance.
- **Purchasing Department:** noted that the Municipal Code was written in a time when technology was not prevalent, and is out of date. The IT Governance must accommodate a purchasing strategy, and the differences between Products vs. Professional Services.

Recommendations:

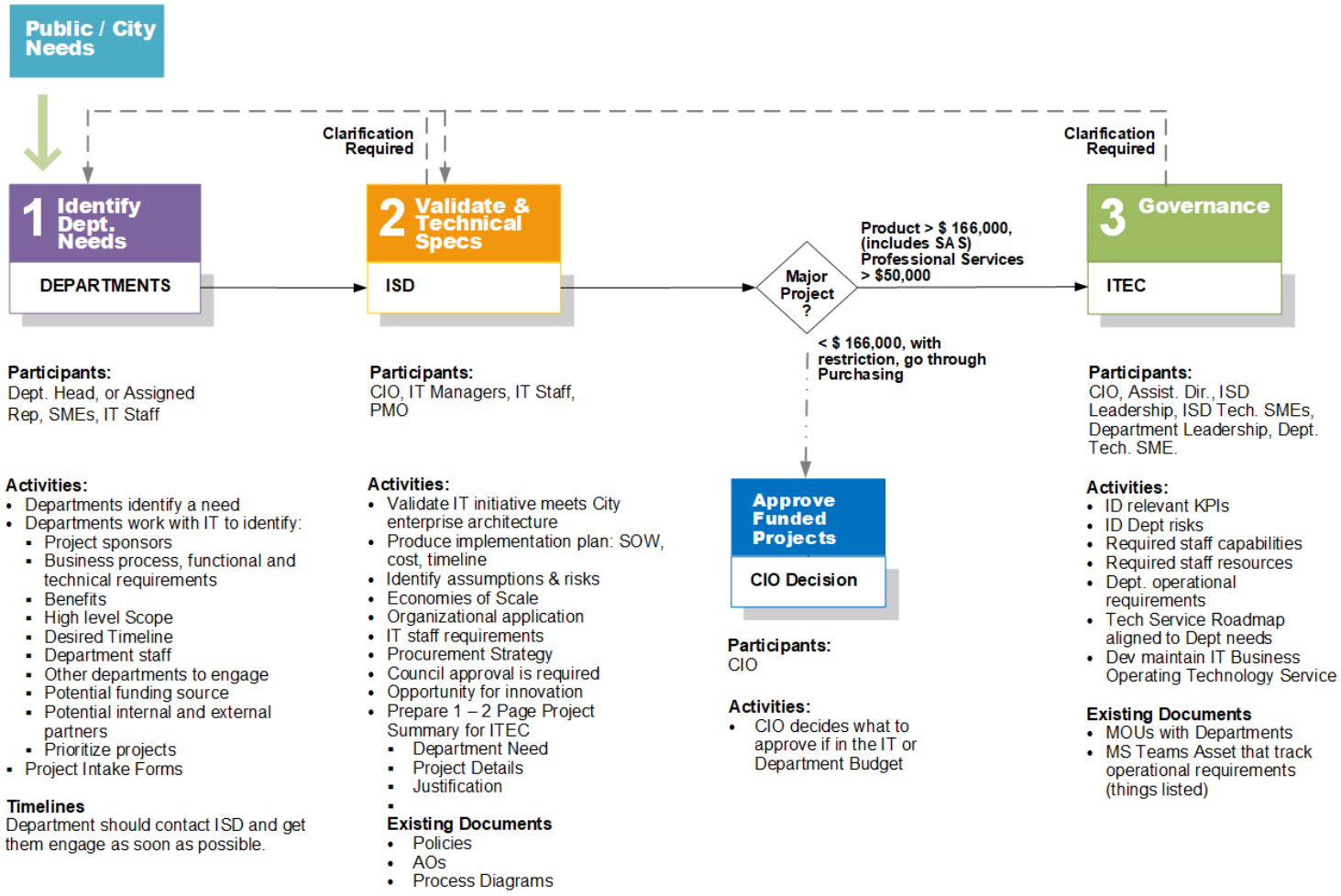
- Establish a formal and simple IT Governance process, supported by articulated policies and practices, as illustrated in the figure articulated in the workshop.
- Ties the existing policies, procedures and practices to the IT Governance process.
- Produce an Administrative Order for IT Governance to reference this information.
- Ensure IT Governance has built-in agility and responsiveness for special projects.
- Update the Municipal Code to reflect contemporary procurement scenarios and requirements.
- Adopt a centralize intake place where application requests go through.
- Adopt a formal IT Governance best practice process with the ITSP including department requirement's definition, ISD validation, specifications and business case for management review.
- Adopt an IT Governance process providing business controls on the planning, procurement and implementation of Information Technologies.
- Adopt well-defined roles of all stakeholders' departments, ISD, and ITEC.
- Employ an RFP process wherever relevant, with mandatory requirements definition, functional and technical specifications.
- Enforce the IT governance process and policy.

Benefits: (compiled from all focus groups and workshops above)

- Enhanced Planning:
  - Specify IT solutions and plan for required staff resources for successful IT implementations.
  - Prioritized IT initiatives allow for project portfolio/resource management plans.
- Improved Requirements Definition:
  - Identify IT requirements responsive to each department and community.
  - Develop comprehensive functional, technical requirements and specifications.
- Responsive Procurements:
  - Ensure departments do not purchase projects without IT department knowledge and engagement.
  - Vet proposed projects prior to procurement to ensure best value investments.
  - Optimize investments, eliminate procurement of duplicate systems.
  - Cost savings, economies of scale.
  - Allow the City to procure standard and strategic Information Technologies.
- Improved Project Delivery & Implementation:
  - Improve the delivery of solutions customers really need.
  - Catching a problem before going live.
  - Enhance project outcomes.

  - Improved cyber security.
- Improved ISD Support:
  - Opportunity to do things better and faster.
  - Enhanced visibility, knowing what is connected to the network.
  - Ensure ISD can manage and maintain the data, access and systems.
  - ISD will be better positioned to support all IT coming into the City.
- Foster Standards and Enterprise Architecture:
  - Ensure a common IT Enterprise Architecture.
  - Allow the City to procure standard and strategic Information Technologies.
  - Aligns technologies with City's business strategy.
- More Efficient Operations:
  - More efficient and effective City services.
  - Staff time savings.
  - Reduced duplication of effort.
  - Staff Stress reduction.

Figure M 1.1: IT Governance Process



M 2 ISD Organization Model [RW 1] [RW 6] [ITFG 1] [MI 2] [MI 3]

Findings:

The City of Fresno is undergoing a centralization process of IT functions, whereby City IT professionals were placed under the ISD organization. Given the size of the new ISD organization this was an ambitious endeavor, which appears to have been executed successfully. However, the ISD business model is still being fined tuned, an issue of focus of the ITSP Roadmap project.

The need for additional ISD support staff was identified in the IT Focus Groups, Rapid Workflow® business process workshops and Management Interviews with department heads. The data gathered is presented below.

M 2.1 PD Application/DB Programmer [RW 1]

PD noted they had more IT programmers on staff in the past supporting custom applications, resulting in impacting records tracking.

Recommendations:

- Resource additional application and database programmers.

Benefits:

- New programs to address inefficiencies with existing systems.
- Improved, more responsive services to the public.
- Enhanced efficiencies.

M 2.2 NSS Staff [ITFG 1]

ISD staff noted there is a lack of sufficient staff with the capabilities to support ongoing operations and staff requested projects. This results in projects taking longer, operational interruptions, a lack of available staff in emergencies, putting pressure on all levels of staff.

Recommendations:

- Resource additional NSS staff to focus on the areas that are underserved or are currently over leveraging staff to cover those areas.
- Explore additional resources via consulting agreements.

Benefits:

- Improved allocation of staff resources, to projects and operations.
- Increased coverage overall, back up staff on vacation.
- Reduced overtime costs.
- Reduced staff stress.
- Reduced turnover.

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M 2.3 **CAO Application Support** [RW 12]

The City Attorney's Office noted they receive insufficient response from ISD, specifically, support of ProLaw software (and are concerned this may continue with iManage in the future). This results in the following:

- Customer support.
- Delays in the implementation of software.
- Responsiveness to requests.
- ISD staff not assigned to handle ProLaw issues with the vendor and CAO staff.

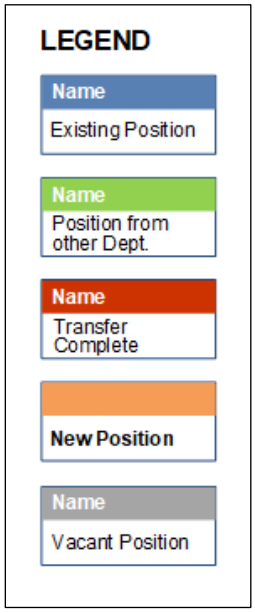
Recommendations:

- Provide dedicated staff to provide application and technical support to end users, assist with adding and deleting end users with associated security and access privileges, ongoing training, and address system related enhancements and application interfaces. (Dedicated staff has recently been onboarded.)

Benefits:

- Better use of both systems, ProLaw and iManage.
- Things would run more smoothly.
- Reduced delays.
- Decreased staff confusion.

The following figure illustrates the current ISD organization, which has resulted from the centralization initiatives. The color-coded staff positions indication the following:



- Existing Position
- Position from another department
- Transfer of staff completed
- Vacant Positions

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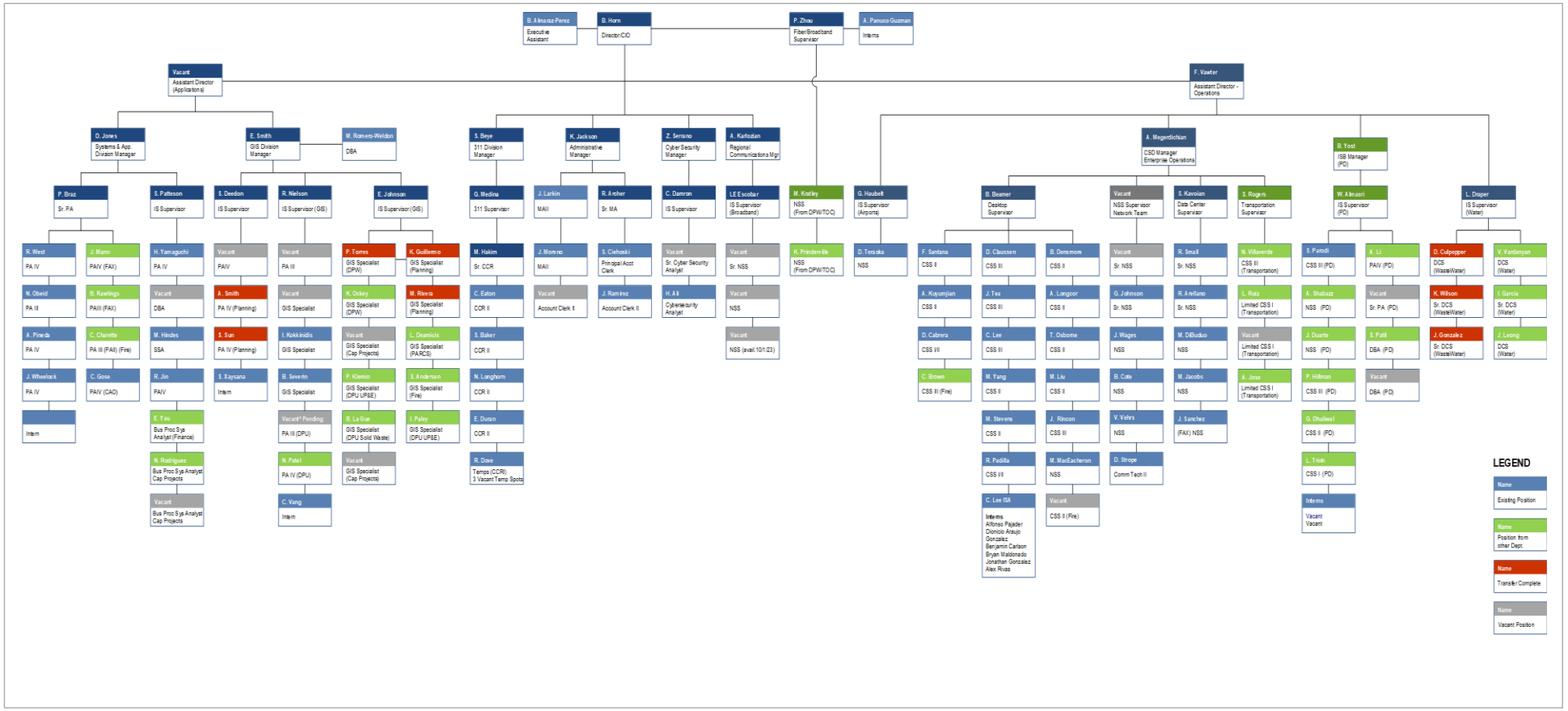
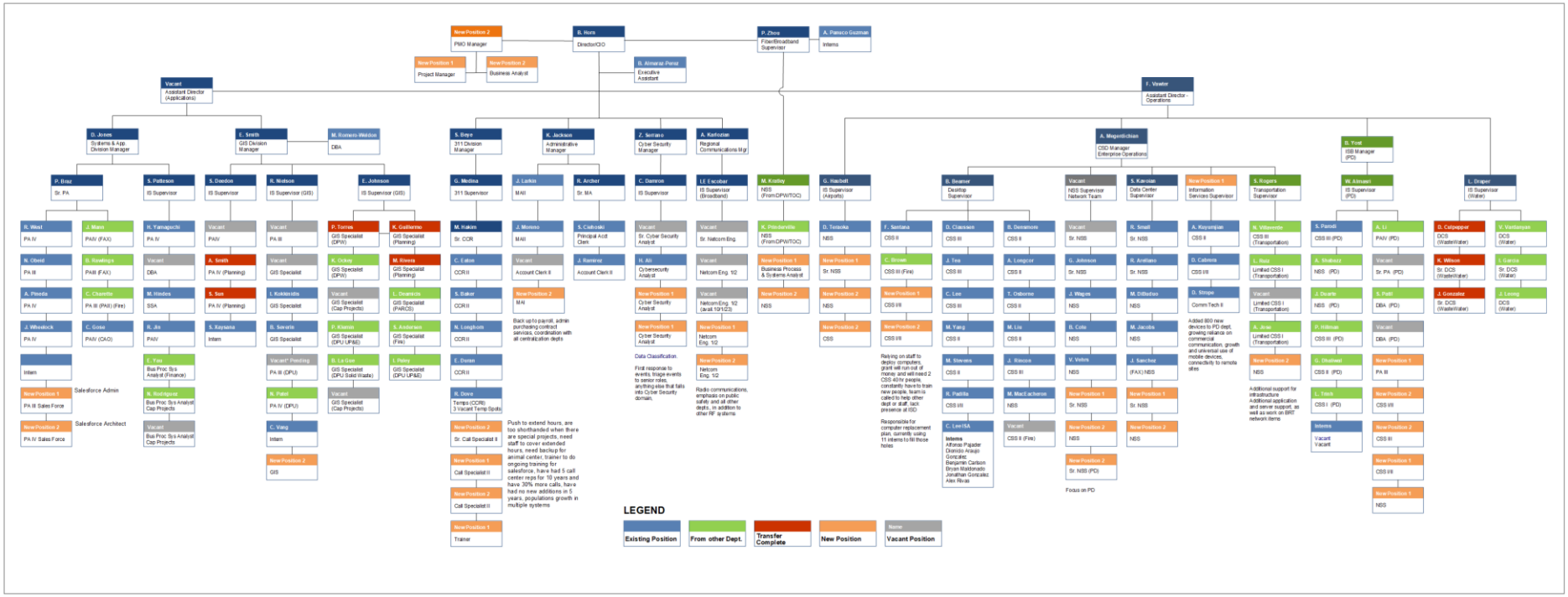
Figure M 2.1: Existing ISD High Level Org Chart



The following figure illustrates the future ISD organization, reflecting the needed ISD resources to effectively sustain the implementation of the ITSP over the next five years. The color-coded staff positions indication the following:

- Existing Position
- Position from another department
- Transfer of staff completed
- New Position
- Vacant Position

Figure M 2.2: Future ISD High Level Org Chart



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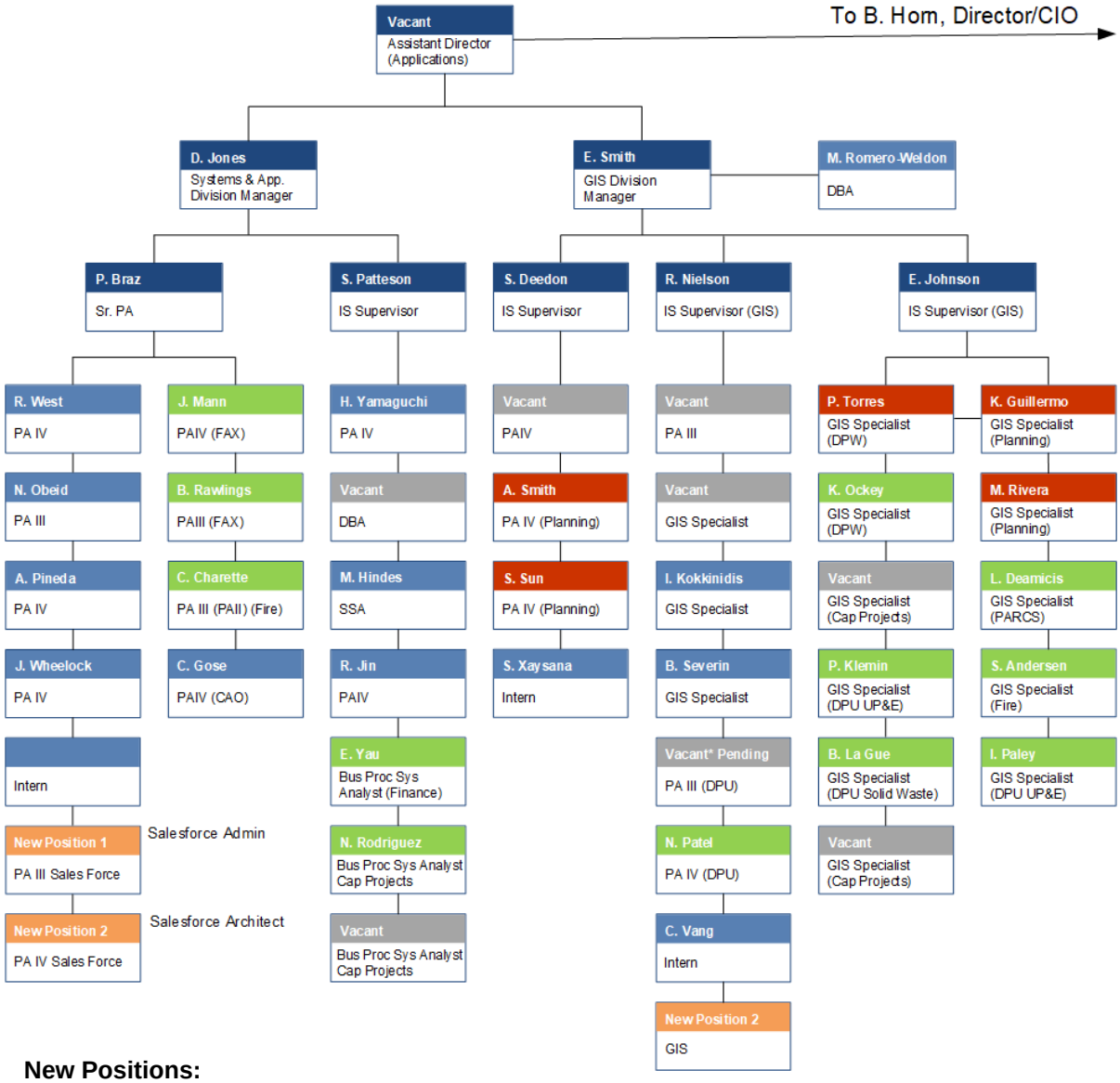
The following figure illustrates the future support staff for the Applications Division, which include the Applications and GIS functions. In this case each group is receiving an additional staff resource, as indicated with the orange position rectangles.

Figure M 2.3: Future Applications Division Org Chart



New Positions:

Systems & Applications	(1)	PA II: Sales Forces support and other apps.
Systems & Applications	(1)	PA IV: Sales Forces support for development of City systems, CRM, and PM.
GIS:	(1)	Maintaining PD GIS systems and mapping (work at PD but report to ISD GIS.)

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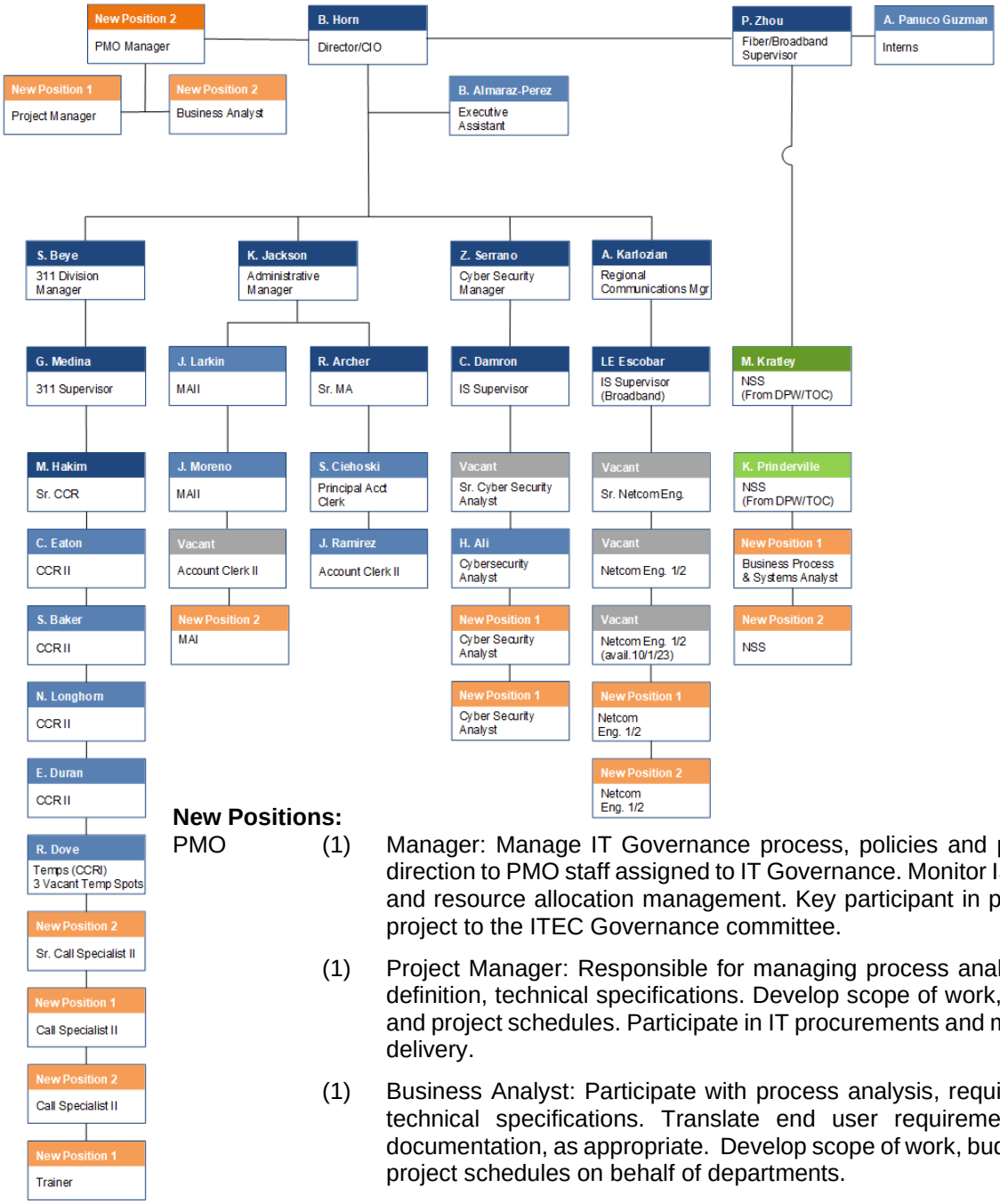
The following figure illustrates the future support staff for the 311, Administrative, Cyber Security and Regional Communication functions. In this case, each group is being allocated an additional staff resource except Administrative, as indicated with the orange position rectangles

Figure M 2.4: Future Divisions Reporting to CIO



New Positions:

PMO (1) Manager: Manage IT Governance process, policies and practices. Provide direction to PMO staff assigned to IT Governance. Monitor ISD project portfolio and resource allocation management. Key participant in presenting potential project to the ITEC Governance committee.

(1) Project Manager: Responsible for managing process analysis, requirements definition, technical specifications. Develop scope of work, budget estimates, and project schedules. Participate in IT procurements and managing IT project delivery.

(1) Business Analyst: Participate with process analysis, requirements definition, technical specifications. Translate end user requirements into technical documentation, as appropriate. Develop scope of work, budget estimates, and project schedules on behalf of departments.

311 (1) Sr. Call Specialist II

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311	(2) Call Specialist II: Take 311 Calls to expand the hours. Streamlining, look for opportunities to leverage AI before the call to the agent. Call deferrals, online self-help options for customers. Possible overflow for Animal Center. (1) Trainer: Trainer will report directly to S. Beye. To be the new CRM Trainer, audit tickets, special projects as assigned by Manager.
Admin	(1) Management Analyst II
Cyber Security	(2) Cyber Security Analyst: Data Classification.
Regional Com	(2) Netcom Engineers 1/2
Fiber Broadband	(1) Business Process & Systems Analyst & NSS: Help support the (1) NSS: City Broadband program, working with carriers, and network design.

The following figure illustrates the future support staff for the Operations function.

Figure M 2.5: Future IT Operations Division Org Chart

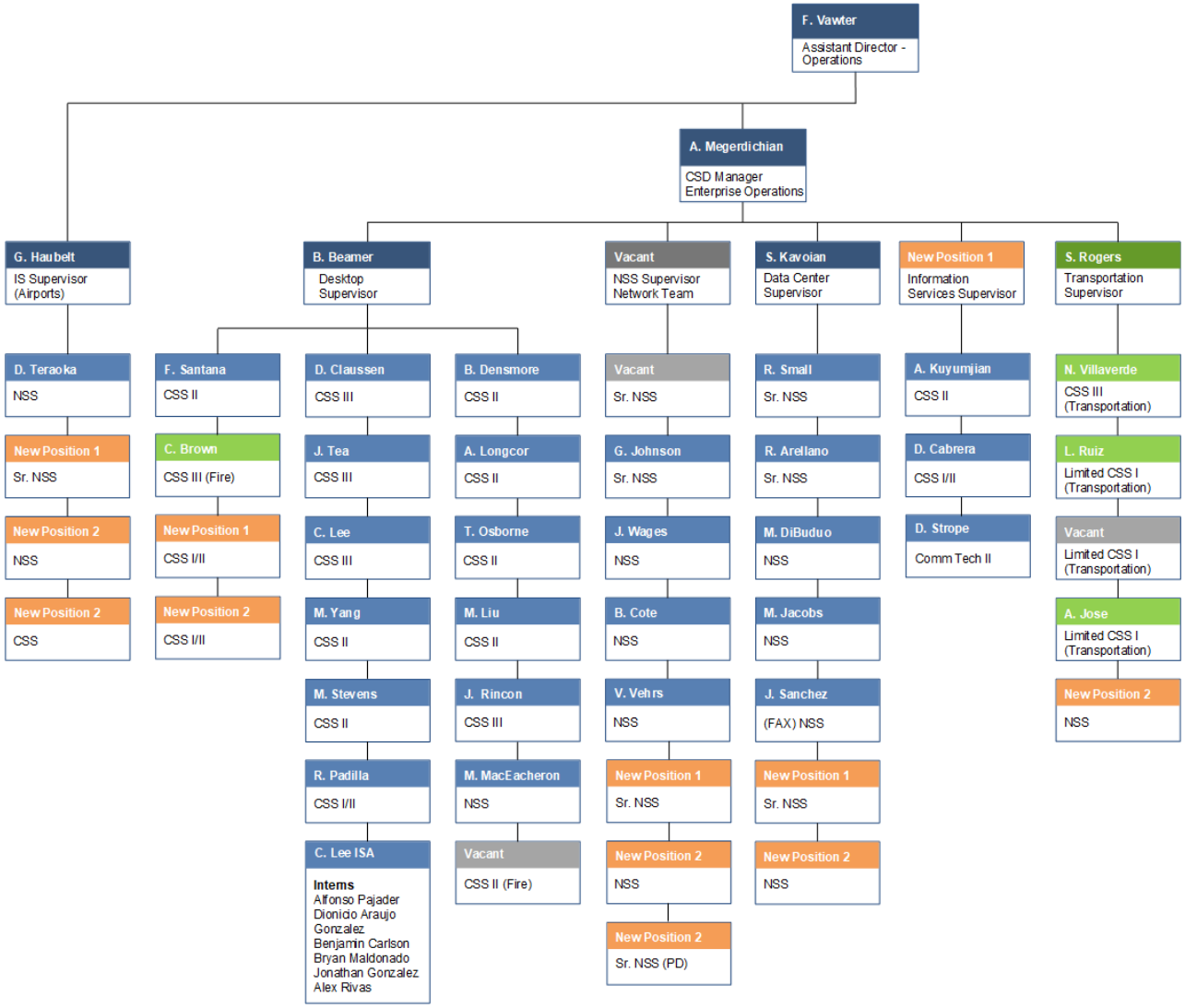

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Figure M 2.5: Future Operations Division Organization Chart (continued)

New Positions:

Airports	(1)	Sr. NSS: Network and server support, access control support, and CCTV support. Increase after hours coverage and maintenance.
	(1)	NSS: Network and server support, access control support, and CCTV support. Increase after hours coverage and maintenance.
	(1)	CSS: Assist with other duties and Help Desk Support.
Desktop	(1)	CSS I/II: Assist with MSC Support rotations
	(1)	CSS I/II: Assist with the workstation replacement program
Network Team	(1)	Sr. NSS
	(1)	NSS Added support for city network operations and facilitate the completion of projects. Currently NSS staff does both projects and operations and the level of current staff is so low that projects are often side-tracked due to operational requirements and shifting project priorities. Due to the size/scope of the network hardware replacement is an ongoing task. Also, the improvement of operational discipline (monitoring / documentation / inventory) for central IT as well as assistance for groups being centralized.
	(1)	Sr. NSS (PD): Added support for city data center operations and facilitate the completion of projects. Currently NSS staff does both projects and operations, while staffing deficit is not as bad as the network team we are still working to dig out of technical debt, improve our operational awareness and discipline (monitoring / documentation / inventory) for central IT as well as assistance for groups being centralized. As well as address system lifecycle (hardware/software/OS) issues. This includes addressing the backlog of older systems that need to be upgraded, maintaining the required pace of upgrades and improving patching processes.
Data Center	(1)	Sr. NSS
	(1)	NSS: Added support for city data center operations and facilitate the completion of projects. Currently NSS staff does both projects and operations, while staffing deficit is not as bad as the network team we are still working to dig out of technical debt, improve our operational awareness and discipline (monitoring / documentation / inventory) for central IT as well as assistance for groups being centralized. As well as address system lifecycle (hardware/software/IS) issues. This includes addressing the backlog of older systems that need to be upgraded, maintaining the required pace of upgrades and improving patching processes.
Infor. Services	(1)	Supervise the work and staff of Information Services. Supervise the work and the staff of the Telecommunications Section of the IT Operations Group.
Transportation	(1)	NSS: Additional application and server support, as well as work on BRT network items.

The following figure illustrates the future organization of support staff for the Police Department and Water function.

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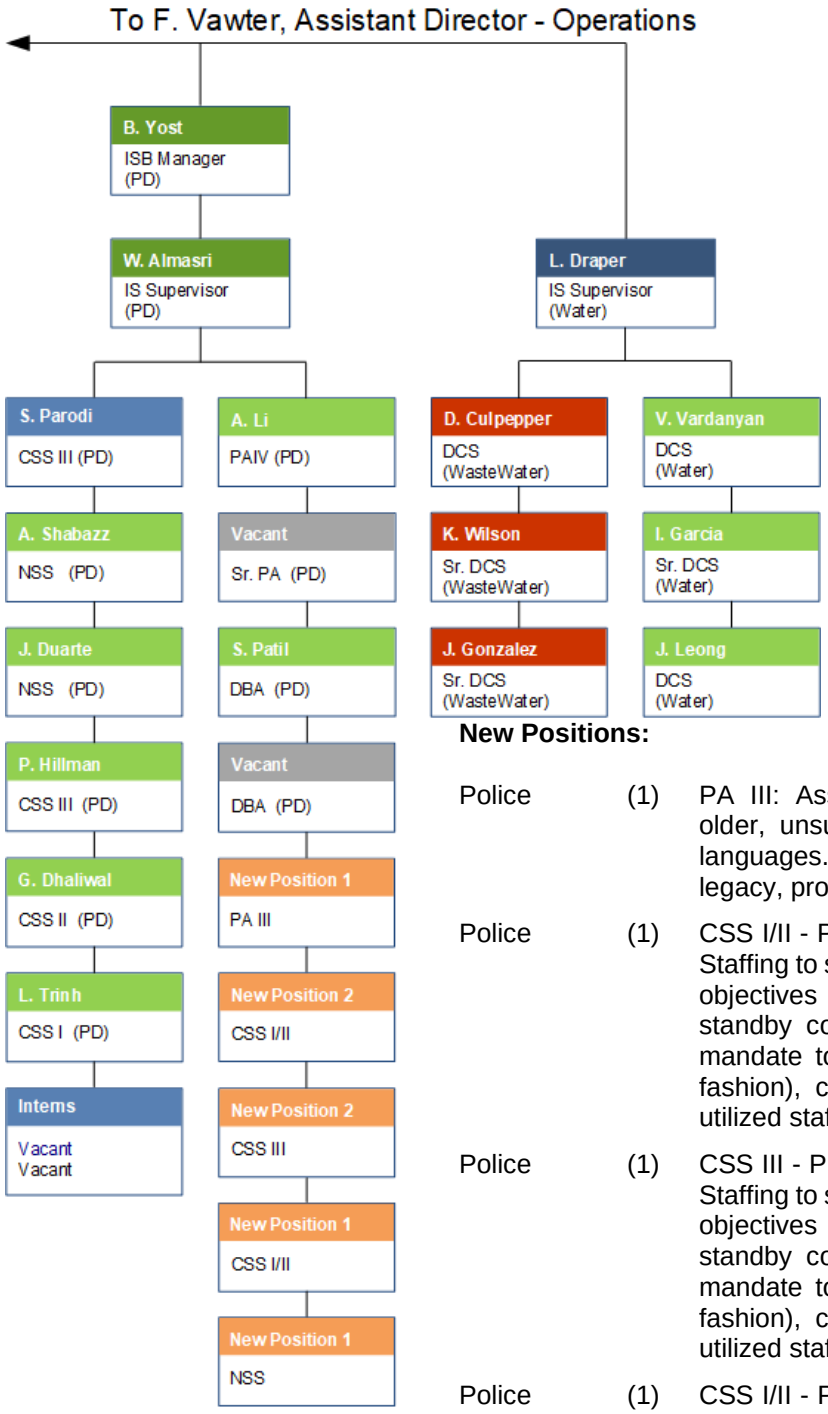
Figure M 2.6: Future Police & Water Divisions Organ Chart



New Positions:

Police	(1)	PA III: Assist in re-writing internal programs from older, unsupported languages to newer, supported languages. Triage security challenges with existing, legacy, programs.
Police	(1)	CSS I/II - PD Mid-shift: Mid-shift: 9:00 pm to 6:00 am Staffing to support 24x5 operations, in pursuit of City's objectives for afterhours IT support and reducing standby costs. Note: Regional Comm also has a mandate to provide 24x5 support (in a sustainable fashion), consider options to cross-train and cross utilized staff.
Police	(1)	CSS III - PD Mid-shift: Mid-shift - 9:00 pm to 6:00 am Staffing to support 24x5 operations, in pursuit of City's objectives for afterhours IT support and reducing standby costs. Note: Regional Comm also has a mandate to provide 24x5 support (in a sustainable fashion), consider options to cross-train and cross utilized staff.
Police	(1)	CSS I/II - PD Swing-shift: PD Swing-shift: 4:00 pm to 1:00 am
Police	(1)	NSS: PD Swing-shift: 4:00 pm to 1:00 am

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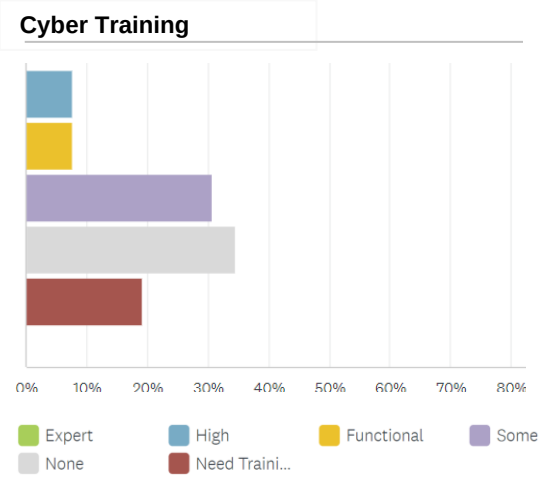
M 3 IT Skills Survey

Findings:
The following data provides a partial summary of the ITSP IT Staff Skills Online Survey.

The survey gathered data on ISD staff knowledge, skills, and abilities (KSAs) from IT staff in each ISD division. Eighty (80) City staff responded to this survey; a separate survey was provided to GIS Professionals.

ISD Division staff responded to a list of key IT skill sets in their business unit. The survey findings included a graph for each system knowledge area.



The following data only presents responses where staff rated the knowledge levels as "None" or "Need Training," or where training is most required. This information can be used to assess and provide ISD staff training as needed. Complete KSA findings are contained in the Skills Survey Deliverable.

ISD Division	None	Need Training
Administration Division: Responsible for ISD Financial aspects including Processing personnel information.		
• Grant Administration	75%	7.14%
• Financial Analysis & Reports	42.28%	6.90%
• Project Management & Administration	21.88%	6.25%
• Personnel Investigations & Disciplinary Actions	48.39%	3.23%
Communications Division: Responsible for telecommunications for the City of Fresno.		
• Nokia Network Hardware	61.54%	11.54%
• Microwave Network	60.00%	12.00%
• UHF/VHF Radio Systems	52.00%	12.00%
Information Security Division: Responsible for data security for the City of Fresno.		
• Adversary Hunting	60.00%	4.00%
• SoC Ops	54.17%	4.17%
• Threat Intelligence	52.00%	4.00%

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ISD Division	None	Need Training
Computer Services Division: Responsible for Network/Server Infrastructure.		
• Virtual Host Management – HX	64.86%	13.51%
• Virtual Host Management – UCS	64.86%	13.51%
• Virtual Host Management - non-hyper converged	63.89%	13.89%
• ISCSI Infrastructure	56.76%	10.81%
• Fiber Channel Infrastructure	57.14%	5.71%
Computer Services Division: Responsible for Desktop/Laptop Support.		
• Quoting for Procurements	27.60%	5.00%
• Zen Bundle Creation	25.61%	20.00%
Computer Services Division: Responsible for Cell Phones/Mobility		
• Apple Business Manager	51.52%	6.06%
• Microsoft Intune	56.67%	6.67%
• Mobile Routers (Cradlepoint & Sierra Wireless)	38.71%	6.45%
Computer Services Division: Soft Skills		
• Business Analysis Support	25.64%	7.69%
• Managing/Supervising	21.95%	9.76%
Computer Services Division: Microsoft Tools - Support and Troubleshooting		
• SharePoint	18.60%	13.95%
Computer Services Division: Microsoft Tools – Usage		
• SharePoint	6.52%	10.87%
Computer Services Division: FAX/DOT Centric Software		
• Veederoot	75.86%	6.90%
• EJ Ward	72.41%	6.90%
Computer Services Division: Waste Water Centric-Software		
• Foreseer	85.19%	3.70%
• Wincam	85.19%	3.70%
• Win911	85.19%	3.70%
Computer Services Division: Water-Centric-Software		
• CNI Work Order Management System	73.08%	0.00%
Computer Services Division: Police Department-Centric Software		
• Axon	53.13%	6.25%
• Netmotion	56.25%	6.25%
Computer Services Division: Licensing		
• Adobe License Management	35.29%	5.88%
Computer Services Division: Traffic Operations (IT based)		
• Alcatel-Lucent L3 OS	75.00%	7.14%
• Etherwan L2 OS	75.00%	7.14%

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• Encom Wireless	74.07%	7.41%

ISD Division	None	Need Training

Systems & Applications Division: Enterprise Applications

• Laserfiche	53.33%	10.00%
• BFM (Budget)	75.00%	10.71%
• Financials (Munis)	46.43%	7.14%

Systems & Applications Division: Department Applications

The following list of application software reflects required training required across the board in this division.

- Pavement Management
- iManage
- Workiva
- CashPro
- Treasury Software
- Fleet Management
- Fuel Management
- Traffic Management
- Cornerstone LMS
- NeoGov

Recommendations:

- Leverage the data from City management, staff and the IT Skills Survey to develop a plan to fill the knowledge gaps in each of the ISD Divisions.
- Align ISD staff training with ongoing and planned ITSP initiatives.
- This should be an ongoing effort.

Benefits:

- Ensure system sustainability,
- Meet end users needs and
- Achieve a return on investment in new and emerging technologies.

M 4 End-user Training [MI 3] [MI 8] [MI 25]

M 4.1 Hexagon EAM/Cognos [RW 2] [RW 3]

Staff have not been fully trained in Hexagon EAM/Cognos reports, which results in:

- Inefficiencies.
- Underutilization of Hexagon EAM, e.g., project planning, work order planning, scheduling, asset management.
- Loss of staff time.
- Lost opportunity costs.

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Recommendations:
Provide training on Hexagon EAM/Cognos to all staff who require it, e.g., Asset Manager, EAM System Administrators, Maintenance Manager, field staff.

Benefits:
- Reduced staff stress.
- Improved efficiency.
- Improved staff morale.
- Improved project delivery.
- Improved knowledge of where information is stored.

M 4.2 **GIS Training Program** [ITFG 3]
GIS Specialists growth, training, and conference attendance is not budgeted for nor prioritized. This includes the time needed to do the training, which is provided for free under the Enterprise Agreement with esri. GIS is always evolving and requires ongoing training. This results in the following:
- GIS Specialists are not learning new tools/skills to improve their workflow.
- Time and effort are being spent on maintaining obsolete systems.
- Impacts efficiency.

Recommendations:
- Improve budget processes for conference attendance.
- Prioritize training at the management level.
- Designate time to learn and acquire new skills.
- Provide standard GIS training for GIS Specialists during the on boarding process.
- Identify required staff capabilities, and provide related training.

Benefits:
- Develop GIS projects employing best practices.
- Can do business process reengineering to reduce manual work.

M 4.3 **Non-Permit Tech Staff Training** [RW 6]
Planning and Development, Building noted in the Rapid Workflow® business completeness review process workshop, that Permit Tech staff process all applications in and out, but their lack of training results in:
- Bottlenecks.
- Impact services to 3 other departments who want streamlined processes.
- Applicant and staff frustration.
- Permit Tech confusion.

Recommendations:
- Staff training, allocate time for training.
- Training of non-Permit Tech staff.

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Benefits:
- Process applications more efficiently, in a timely manner.
- Less frustrated staff and applicants.
- Faster turnaround on applications/permits.
- Improve staff retention.
- Improve staff morale.
- Improve customer experience.
- Keep internal staff content with fixes they ask for.

M 5 Funding for Dig Once Policy [ITFG 1]

Findings:
The IT Focus Group with ISD staff revealed highspeed connectivity is important to the city and the local economy. There is currently a Dig Once policy in place to help facilitate the installation of fiber optic infrastructure, however the policy is not well supported and funded to enforce. This results in the following:
- Projects result in roadways being dug up.
- ISD and other stakeholders are not able to take advantage of the opportunity to install infrastructure while the ground is open.
- Has less infrastructure to support broadband.
- Have to rely on AT&T and others as infrastructure providers.

Recommendations:
- Identify funds that can be used to for the installation of infrastructure when and where it is appropriate.
- Develop processes and policies that keep stakeholders informed, on a reasonably timely basis, of opportunities to install infrastructure.
- Have ISD be a signatory to City capital improvement projects where street trenching will take place.
- Have the permitting, Department of Public Works, inform ISD of proposed work.
- Set funding aside and available to take advantage of street trenching.
- Adopt a repair budget.

Benefits:
- Improved infrastructure city-wide to support deployment of fiber optic infrastructure.
- Increased connectivity opportunities among city-owned/operated sites.
- Increase opportunities for open access and additional ISPs to enter into the market.
- Existing partnership with a local ISP is demonstrating that with additional ISPs in the market, customer service improves while cost of the service is reduced. (Local ISP is providing enterprise level 1 Gbps internet service at $900/month versus national ISPs at $1,100/month.)
- Have much more infrastructure across the City for the City to use, as well as residents and businesses.

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- It would reduce the cost of using other carriers. For instance, there is a local company offering to provide services at 1/3 less of the AT&T costs (which the City already has a relationship with).

M 6 Streamline IT Recruitment [ITFG 5]

The IT Focus Gorup with ISD staff revealed challenges with recruitment, filling vacancies, staff retention, and an inability to keep up with private sector salaries. Funding ISD positions is also problematic. This results in the following:

- Reduction of service.
- Staff use the City as a stepping stone for training and then leaving, or not being able to provide the promotion opportunity or salary to retain staff.
- Impacts succession planning.
- The time and process it takes to fill a vacancy is too long, losing candidates.
- Attracting the right candidates with the needed skillsets.

Solutions:

- Work on streamlining the recruitment process.
- Sell the City's benefits, retirement package, and total compensation to compete with the private sector. Complete a compensation study that assess both public and private employers.
- Establish remote work flexibility as a benefit, for some roles.
- Create more entry level positions, that could grow into higher level positions, i.e., Mayor's Youth Job Corp.
- Revisit job specifications.
- Re-evaluate need for college degrees on some positions.
- Expand outreach.

Benefits:

- More stable services.
- Planning for the future would be easier.
- Could take on more projects.
- Help prevent staff burn out.
- Better retention of existing staff.
- Reduce the risk of a cyber security events.
- Reduce outside consulting services.

M 7 Streamline Procurement Process [ITFG 5]

The IT Focus Group with ISD staff revealed the City hires consultants to do work on enterprise systems. The procurement process does not fit IT's needs, and because of procurement constraints, the professional services are limited, and sometimes Council delays professional services contracts. This results in the following:

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- Systems are deployed, then another consultant comes in, and there is no internal knowledge of the product or documentation, and there is an inability for ISD staff to maintain the system.
- The City becomes dependent on consultants.

Solutions:
- Streamline Procurement Process.
- Product and system configuration documentation should be part of every implementation project.
- Provide staff training and knowledge transfer prior to the consultant leaving.
- Utilize a Job Order Contracting program for IT services.

Benefits:
- Improved turnaround on IT projects.
- Reduced staff stress.
- Better able to support implemented systems.

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Section 5
Benefits

5.1 IT Strategic Plan Roadmap Benefits

The ITSP project identified substantial potential benefits that could be realized by implementing the strategy. Qualitative and quantitative benefits were identified in the Rapid Workflow® workshops.

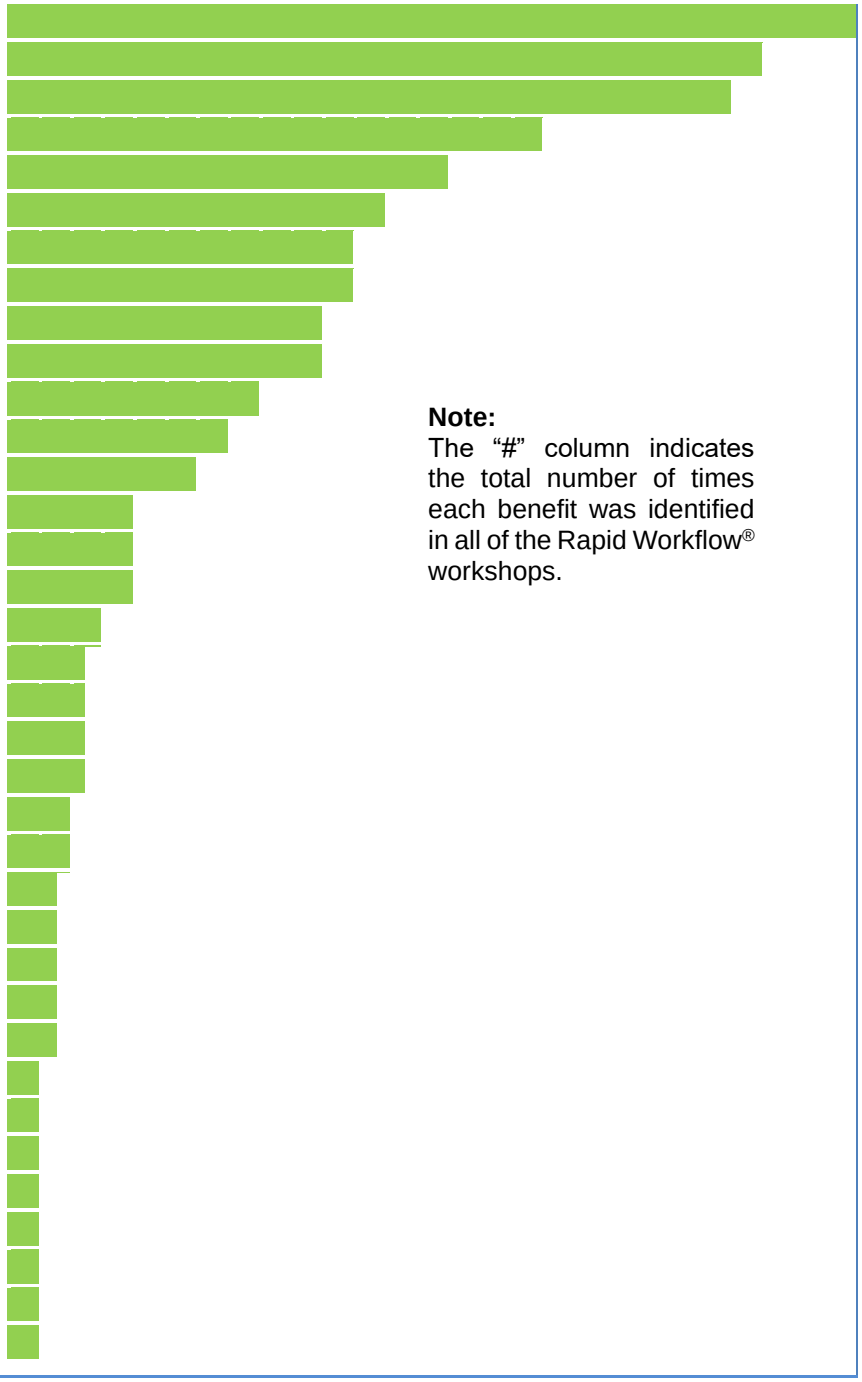
This information was leveraged to prioritize ITSP initiatives. A total of fifty-one (51) potential benefits were identified with a total of four hundred fifty-seven (457) benefits. The first thirty-six (36) are shown in the table on the next page, with an average of 25 benefit opportunities per mission-critical business process assessed in the project.

The figure on the following page, Figure 5.1.1: ITSP Potential Benefits lists the potential benefits to be derived by approving and funding the ITSP. (The number in the column shown as "#" indicates the number of times these benefits were identified in all of the Rapid Workflow® workshops.)

The figure on the following page illustrates the level of magnitude of potential benefits the ITSP initiatives offer the City and its constituents. The top ten will be particularly impactful in assisting the City continue moving forward as the high performing City it already is.

Figure 5.1.1: ITSP Potential City & Community Benefits

	Benefits Types	#
1	Better customer service	61
2	Improve efficiency	46
3	Reduce staff stress	44
4	Staff time savings	32
5	Better information management	27
6	Improve productivity	23
7	Reduce staff and public frustration	21
8	Enhance project delivery	21
9	Improve staff morale	19
10	Business process improvement	19
11	Improve records management	16
12	Improve safety	14
13	Improve document management	12
14	Better organization	8
15	Improve accountability	7
16	Improve staff life	7
17	More trust in the system	6
18	Enhance budgeting	5
19	Help secure funding	5
20	Improve funding	5
21	Physical space savings	5
22	Better reporting	4
23	Improve staff training	4
24	Better ability to plan	3
25	Better system utilization	3
26	Improve staff retention	3
27	Improve public safety	3
28	Improve visibility	3
29	Better perception of the City	2
30	Enhance emergency response	2
31	Improve accuracy	2
32	Improve systems support	2
33	Less likelihood of litigation	2
34	Mitigate risk: change Excel formulas	2
35	Mitigate risk: Microsoft changes	2
36	Reduce paper	2



Note:
The "#" column indicates the total number of times each benefit was identified in all of the Rapid Workflow® workshops.

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Section 6
Appendix

6.1 Glossary of Terms

	Term	Definition
1.	**Access Control**	The term “access control” denotes a technique used to define or restrict the rights of individuals or application programs to obtain data from, or place data onto, a storage device.
2.	**Administrator**	A role responsible for the day-to-day operation of the corporate records management policy. The tasks attributed to Administrators may be divided between several roles, with titles such as Records Manager, Records Officer, Archivist, etc.
3.	**As-Is Business Process Map**	Graphical business process model used to depict the existing condition of a business process. Used for the analysis of current business process steps and activities. Typically produced with input from business subject matter experts and business process owners.
4.	**Automated Workflow**	The tasks, procedural steps, organizations or people, required input and output information, and tools needed for each step in a business process. A workflow approach to analyzing and managing a business process can be combined with an object-oriented programming approach, which tends to focus on documents, data, and databases. This is commonly referred to as ‘Automated Workflow.”
5.	**Backbone**	Another term for bus, the main wire that connects nodes. The term is often used to describe the main network connections composing the Internet

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	Term	Definition
6.	**Bulk Load**	An automatic data import of scanned documents utilizing the indexing schema attributes for subsequent search and retrieval of electronic documents/records stored in an ECMS.
7.	**Business Intelligence (BI)**	Often described as "the set of techniques and tools for the transformation of raw data into meaningful and useful information for business analysis purposes. BI technologies are capable of handling large amounts of unstructured data to help identify, develop and create new strategic business opportunities. BI allows for the easy interpretation of large volumes of data. Identifying new opportunities and implementing an effective strategy based on insights, providing businesses with a competitive market advantage. BI technologies provide historical, current and predictive views of business operations. Common functions of business intelligence technologies are reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics.
8.	**Business Process Improvement (BPI)**	Business process improvement (BPI) is a systematic approach to help an organization optimize its underlying processes to achieve more efficient results. The methodology was first documented in H. James Harrington's 1991 book Business Process Improvement.
9.	**CCTV**	Closed-circuit television (CCTV), also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors.
10.	**Change Management**	An approach to transitioning individuals, teams, and organizations to a desired future state. It focuses on how people and teams are affected by an organizational transition. It deals with many different disciplines, from behavioral and social sciences to information technology and business solutions. In a project management context, change management may refer to the change control process wherein changes to the scope of a project are formally introduced and approved.
11.	**Customer Relationship Management Software**	Customer Relationship Management, CRM, entails all aspects of interaction a company has with its customer, whether it be sales or service related.
12.	**Departmental Software**	Software providing functionality specific to a department in an organization, features and functions not required by any other department. In government, an example might be a Library Information System or Police Department 911 system, both systems which no other departments require. Departmental application software solves department-specific problems and may integrate with enterprise systems.

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	Term	Definition
13.	**DOD 5015.2**	Design Criteria Standard for Electronic Records Management Applications, DOD 5015.2-STD: A DOD and NARA approved set of requirements for Electronic Records Management applications.
14.	**E-Commerce**	E-commerce is business that is conducted over the Internet using any of the applications that rely on the Internet, including interactive and transactional functions, e.g., online payments, registration and application submittals.
15.	**E-Government**	A generic term that refers to any government functions or processes that are carried out in digital form over the Internet. Local, state and federal governments essentially set up central Web sites from which the public (both private citizens and businesses) can find public information, download government forms and contact government representatives.
16.	**Electronic Document Management System (EDMS)**	Functionality to support the computerized management of electronic and paper-based documents. Associated components include a system to convert paper documents to electronic form, a mechanism to capture documents from authoring tools, a database to organize the storage of documents, and a search mechanism to locate the documents.
17.	**Enterprise Architecture (EA)**	A discipline for proactively and holistically leading enterprise responses to disruptive forces by identifying and analyzing the execution of change toward desired business vision and outcomes. EA delivers value by presenting business and IT leaders with signature-ready recommendations for adjusting policies and projects to achieve target business outcomes that capitalize on relevant business disruptions.
18.	**Enterprise-wide**	Deployment or use of a single software application throughout all departments, divisions, or components of the organization.
19.	**Enterprise Content Management System (ECMS)**	An automated system with the functionality to capture, manipulate, retrieve, and publish the entire inventory of digital assets (e.g., web pages, office documents, databases, scanned images, digital photos, digital video, digital recordings, e-mail) created by an organization.
20.	**Electronic Record**	The information recorded in a form that requires a computer or other machine to process it and that satisfies the legal definition of a record according to section 3301 of Title 44 of United States Code (USC).
21.	**Electronic Records Management System (ERMS)**	A collection of hardware, software, staff, policies, and procedures that work in concert to enable an agency to effectively manage records electronically. A software product that identifies, classifies, and disposes of records according to specified records disposition policies.

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	Term	Definition
22.	**Enterprise Resource Planning System (ERP)**	Business management software that allows an organization to use a system of integrated applications to manage the business: e.g., Finance, Human Resources, Asset Management, Customer Relationship Management, Project Management, Business intelligence, to name a few.
23.	**Enterprise Software**	Enterprise applications (e.g., CRM, ERP, BI) assist an organization in solving enterprise/City-wide problems. They integrate with other enterprise systems.
24.	**E-Services**	The concept of e-service (short for electronic service) represents one prominent application of utilizing the use of information and communication technologies (ICTs) in different areas. 'E-Service constitutes the online services available on the Internet, whereby a valid transaction of buying and selling (procurement) is possible, as opposed to the traditional websites, whereby only descriptive information is available, and no online transaction is made possible.'
25.	**Ethernet**	A local-area network (LAN) architecture that uses a bus or star topology and supports data transfer rates of 10 Mbps.
26.	**Fiber Optics**	A high-bandwidth transmission technology that uses light to carry digital information. One fiber telephone cable carries hundreds of thousands of voice circuits. These cables, or light guides, replace conventional coaxial cables and wire pairs. Fiber transmission facilities occupy far less physical volume for an equivalent transmission capacity, which is a major advantage in crowded ducts. Optical fiber is also immune to electrical interference.
27.	**File Plan**	A document containing the identifying number, title, description, and disposition authority of files held or used in an office.
28.	**E-Forms**	Program development tools that build applications by designing electronic forms for data entry, update or processing. Electronic forms are generally designed with visual programming tools that allow fields, buttons and logos to be drawn directly on screen.
29.	**E-Signatures**	An electronic sound, symbol, or process attached to or associated with a contract or other record and used as the legal equivalent of a written signature.
30.	**Geographic Information System (GIS)**	GIS is a collection of computer hardware, software and geographic data for capturing, managing, analyzing and displaying every form of geographically referenced information, often called spatial data.
31.	**Image Capture (scanning)**	A process whereby documents are scanned into a system and stored electronically. Imaging is the digital capture, storage, manipulation and delivery of copies of digitized originals, which may be texts, manuscripts, pictures or other information types.

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	Term	Definition
32.	**Infrastructure**	An enterprise's entire collection of hardware, software, networks, data centers and facilities used to develop, test, operate, monitor and/or support information technology services.
33.	**Interoperability**	The ability of software and hardware on different machines from different vendors to share data.
34.	**Internet Service Provider (ISP)**	Refers to a company that provides Internet services, including personal and business access to the Internet.
35.	**IT Governance**	The processes that ensure the effective and efficient use of IT in enabling an organization to achieve its goals. IT demand governance (what IT should work on) is the process by which organizations ensure the effective evaluation, selection, prioritization, and funding of competing IT investments; oversee their implementation; and extract measurable business benefits. ITG is a business investment decision-making and oversight process, and it is a business management responsibility. IT supply-side governance (how IT should do what it does) is concerned with ensuring that the IT organization operates in an effective, efficient and compliant fashion, and it is primarily a CIO responsibility.
36.	**ITS**	Short for Federal Intelligent Transportation Systems, it is a broad range of wireless and wired communications-based information and electronics technologies that are integrated into the transportation system and in vehicles themselves. ITS is made up of 16 types of technology-based systems.
37.	**Life Cycle**	The records life cycle is the life span of a record from its creation or receipt to its final disposition. It is usually described in three stages: creation, maintenance and use, and final disposition.
38.	**Metadata**	In the context of records management, meta-data is the structured or semi-structured information which enables the creation, management and use of records through time and within and across domains in which they are created.
39.	**Open Data**	The idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other "Open" movements such as open source, open hardware, open content, and open access. The term "open data" is recent, gaining popularity with the rise of the Internet and World Wide Web and, especially, with the launch of open-data government initiatives such as Data.gov and Data.gov.uk.

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	Term	Definition
40.	**Optical Character Recognition (OCR)**	The recognition of printed or written text characters by a computer. This involves analysis of the scanned-in image and then translation of the character image into character codes, such as American Standard Code for Information Interchange (ASCII). OCR is applied to image (raster) files to create text-searchable files.
41.	**PBX System**	A private branch exchange (PBX) phone system that's delivered as a hosted service, typically by one of the major telephone companies.
42.	**Portable Document Format (PDF)**	This format is proprietary to Adobe Inc. and is widely used as a de-facto data exchange method.
43.	**ThirdWave Rapid Workflow® Process Modeling®**	US Patent 8615423 B1: A method of rapid workflow process modeling, which is established according to a triangulation principle. The method integrates issues of management, operation and technology including information technology that are three fundamentals of a triangulation principle to characterize challenges and opportunities for process improvement of any organization including military units, governmental agencies and public and private business sectors. Specifically, the method is comprised of seven steps such as the As-Is process mapping, problem statements, impact statements, solution statements, benefit statements, To-Be process mapping and cost benefit analysis for generating a quantitative projection of the business cost reduction. Application of the method is able to comprehensively and effectively address challenges and opportunities for all aspects of the organizational process improvement.
44.	**Record**	The information, regardless of medium, that details business transactions. Records include all books, papers, maps, photographs, machine-readable materials, and other documentary materials, regardless of physical form or characteristics. Records are made or received by an Agency under Federal law or in connection with the transaction of public business. Records are preserved or appropriate for preservation by that Agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government, or because of the value of data in the record.
45.	**Records Manager**	Individuals who are responsible for records management administration.

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	Term	Definition
46.	**Retention Period**	The length of time that a record must be kept before it can be destroyed. Records not authorized for destruction are designated for permanent retention. Retention periods for temporary records may be expressed in two ways: • A fixed period from the time records in the series or system is created. Normally, a fixed period that follows their regular cutoff dates. For example, the phrase "destroy after 2 years" provides continuing authority to destroy records in a given series 2 years after their creation (normally 2 years after their regular cutoff date). • A fixed period after a predictable event. Normally, a fixed period following the systematic cutoff applied after completion of an event. The wording in this case depends on the kind of action involved.
47.	**Retention Schedule**	A plan for the management of records listing types of records and how long they should be retained by the organization for business purposes; the purpose is to provide continuing authority to dispose of, transfer, or archive records.
48.	**SAN**	A Storage Area Network (SAN) is a network that provides access to consolidated, block-level data storage. SANs are primarily used to enhance storage devices, such as disk arrays, tape libraries, and optical jukeboxes, accessible to servers so that the devices appear to the operating system as locally attached devices.
49.	**Service-Oriented Architecture** (**SOA**)	An architectural pattern in computer software design in which application components provide services to other components via a communications protocol, typically over a network. The principles of service-orientation are independent of any vendor, product or technology, Services can be combined to provide the functionality of a large software application.[3] SOA makes it easier for software components on computers connected over a network to cooperate. Every computer can run any number of services, and each service is built in a way that ensures that the service can exchange information with any other service in the network without human interaction and without the need to make changes to the underlying program itself.
50.	**Taxonomy**	The study of the general principles of scientific classification: systematics; classification; especially orderly classification of plants and animals according to their presumed natural relationships. Taxonomy is a high-level, hierarchical classification for documents and records that facilitates the management (storage, access, retrieval, revision, archiving, and disposition) of recorded information throughout its life cycle. A taxonomy is a living document that changes as the work within the company changes. It is never final because organizations constantly change their content types, processes and organizational structures.

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	Term	Definition
51.	**ThirdWave Strategic Planning Triangulation© Methodology**	ThirdWave's Strategic Planning Triangulation methodology is a powerful technique that facilitates validation of data through cross verification from two or more sources. This is accomplished by the collection and synthesis of data from three: Management perspective (Organizational, policy and finance), Operational perspective (business process and practices), and Information Technology perspective (enterprise-wide systems). In particular, it refers to the application and combination of several research methods in the study of the same phenomenon to produce comprehensive and thorough strategies based on a compelling business case.
52.	**To-Be Business Process Map**	Graphical business process model used to depict the future state (To-Be) condition of a business process. Used for the design of reengineered business process steps and activities. Typically produced with input from business subject matter experts/business process owners.
53.	**Waterfall Methodology**	The waterfall model is a sequential design process, used in software development processes, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of conception, initiation, analysis, design, construction, testing, production/implementation and maintenance.
54.	**Web Browser**	Web browser is a software application used to locate, retrieve and display content on the World Wide Web, including Web pages, images and video.
55.	**Wi-Fi**	Wireless-Fidelity certification mark issued by the Wi-Fi Alliance to certify that a product conforms to the 802.11b, g and a standard for WLANs.
56.	**XO ISP Bandwidth**	Bandwidth Shaping. The process of manipulating, managing or controlling (shaping) portions of a network connection to the outside world and determining an allowed bandwidth consumption based on types of activities. The term is commonly used in conjunction with Internet Service Providers (ISP), where it refers to a tool that is used to limit or direct bandwidth consumption by users.

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