CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 8, 2014

Item 1, Report No. 1, of the Priorities and Key Initiatives Committee, which was adopted, as amended, by the Council of the City of Vaughan on April 8, 2014, as follows:

By approving the recommendation set out in Communication C5 from the Commissioner of Finance & City Treasurer and the Commissioner of Strategic and Corporate Services, dated April 4, 2014, as follows:

> ***That the funding requests associated with the Corporate Technology Strategic Direction be considered as part of future budget processes and in consideration with all city-wide funding requests.***

1 CORPORATE TECHNOLOGY STRATEGIC DIRECTION

The Priorities and Key Initiatives Committee recommends:

1) That the recommendation contained in the following report of the Commissioner of Strategic and Corporate Services and the Chief Information Officer (CIO), dated March 17, 2014, be approved; and

2) That the presentation by Mr. Ben Perry, Prior & Prior Associates Ltd., Glenburn Forest Way, Markham and Communication C1, presentation material, be received.

Recommendation

The Commissioner of Strategic and Corporate Services and the Chief Information Officer (CIO), in consultation with the Senior Management Team, recommend:

1. That the presentation by Prior & Prior Associates Ltd. be received, and;

2. That the following Strategic Directions, which are outlined in the Executive Summary of the attached Corporate Technology Strategic Plan be approved:

   SD1 - More corporate, planned approach
   SD2 - Flexible, Reliable and Forward Looking IT Infrastructure
   SD3 - Building Effective Business Systems
   SD4 - Integration and Intelligence
   SD5 - Connecting Field Staff with Technology
   SD6 - Delivering Digital Services Anytime, Anywhere

   and;

3. That future systems and technology requirements be identified and prioritized within the context of Strategic Directions and brought forward for consideration by Council at the appropriate time.

Contribution to Sustainability

The Strategic Directions outlined in the attached Corporate Technology Strategy Plan will enable further collaborative governance of corporate information and technology assets and increased leveraging of technology to facilitate business process and service delivery improvements.

Economic Impact

Approval of the Strategic Directions contained in the attached Corporate Technology Strategic Plan do not require funding. The Strategic Directions will serve as guidelines for strategic

…/2

identification of systems and technology improvement opportunities through a collaborative approach with the City departments and the IT Governance framework. Future systems and technology improvement opportunities will be built into yearly departmental business plans. These opportunities will have detailed costs, resourcing requirements and associated business benefits identified and will be submitted for consideration and prioritization in future business and financial planning cycles through the Additional Resource Request (ARR) process.

In addition to the Strategic Directions, the consultant's report contains a number of specific recommendations, which have significant economic impact. For example, the consultant recommends that over the next 5 years, an investment of twenty (20) additional FTE's be made in areas of information systems support, business analysis support, corporate systems leadership and technology support. These resources are critical to effectively support previously identified systems and technology improvement initiatives, such as Asset Management and EDRMS, as well as to support anticipated future systems. Consultant's recommendations for additional resources will be considered by staff as part of the yearly corporate and financial planning process, balanced against other priorities and brought forward to Council for consideration at the appropriate time.

Staff acknowledge that investments recommended in the strategy will mean more effective digital processes that simplify customer access and accelerate processing times, that reduce errors and cut staff time spent on low value administrative work. It will also lead to new online services that reduce unnecessary trips and calls to City Hall and that increase citizen satisfaction and engagement. Data driven insights into the City's performance, enabled by IT investments, will drive continuous improvement and enhanced cost effectiveness.

These significant benefits aside, by establishing a senior led partnership approach that focuses upon business process, technology and information management, the City will integrate systems thinking into the fabric of the organization, which will drive cost savings and avoidances through optimization for decades to come.

Communications Plan

The Strategic Directions outlined in the Corporate Technology Strategic Plan will transform the way technology initiatives are identified, championed, scoped, planned and managed. Extensive engagement with stakeholders and the IT Governance Committee has occurred as part of the development of the Corporate Technology Strategic Plan. Stakeholder engagement, raising of awareness and education will continue as part of the Strategic Directions rollout.

Purpose

The purpose of this report is to inform the Priorities and Key Initiatives Committee of the ongoing progress being made in growing corporate technology capabilities to address the City's rapidly growing operational and service delivery requirements, and to receive Committee approval for future technology Strategic Directions.

Background – Analysis and Options

Well-run cities around the globe rely on their *systems* to be effective. *Systems* in this context are their business processes, technology, and business solutions that support them. The larger cities get, the more reliant they become on process automation to facilitate large volumes of requests, to ensure service delivery consistency and to manage teams and resources effectively.

Today, the most effective municipalities are designing their processes and engagement mechanisms from their client's perspective – making them easy to access and convenient to use. They build digital processes so that they can meet customer expectations for access to City services to be available online, on the go and 24x7.

City Growth and Maturity Require Updated Technology Strategy

Over the past few years the City has undergone significant change. This change is driven by rapid City growth, increased demand for municipal services, Council priorities, such as continuous improvement, public service renewal, operational efficiency and organizational re-alignment. As the City grows and transforms its operational and service delivery processes, the business requirements for technology and use of information also change significantly. The City needs to further mature its technology capabilities in response to emerging requirements. To facilitate growth and maturing of technology capabilities, an updated corporate technology strategic plan was developed in 2013.

To develop the corporate technology strategic plan, staff partnered with Prior & Prior Associates Ltd. – a strategic consulting organization with over 30 years of experience in the field of technology strategy development in the public sector. Prior & Prior Associates Ltd. is based in Markham, Ontario and has many municipal government clients in the Greater Toronto Area and across Canada.

The consultant's full report, titled "Corporate Technology Strategic Plan", is attached (Attachment 1).

Place Greater Value On Systems and Technology

The Corporate Technology Strategic Plan provides the opportunity for the City's leadership to recognize the need to mature the City's systems and place greater value upon systems and technology going forward. The City's systems must evolve and mature for the City to be as effective and efficient as it can be, for it to offer services in the way that customers want them, and for it to keep pace with competing municipalities.

At the heart of the Corporate Technology Strategic Plan are the following Strategic Directions, which need to be adopted by the City in order to effectively advance the plan:

SD1 – More corporate, planned approach

The City must tackle larger and strategic, enterprise challenges, rather than small, interim, and incremental projects. An Enterprise Architecture that provides a blueprint for a fully integrated technology environment will guide this new approach.

SD2 – Flexible, Reliable and Forward Looking IT Infrastructure

The City's ITM team will continue to provide high quality, reliable infrastructure services as cost-effectively and at best value for the City. Taking advantage of new technologies, infrastructure will be designed to be flexible and scalable to meet future needs. ITM will closely monitor industry trends and be ready to embrace new technologies that add value to the City more rapidly than in the past.

SD3 – Building Effective Business Systems

The City will focus upon setting business goals and strategy, and on business process redesign and optimization, before deploying integrated technologies or enhancing existing ones. The City will commit to fully leveraging its existing business systems – this means maximizing use and driving greater value from business systems, such as JD Edwards, DTA, AMANDA and the GIS. The City will also implement new business systems to address gaps in the systems architecture such as Asset Management, Point of Sale, and EDRMS.

SD4 – Integration and Intelligence

By digitizing processes, improving its data management practices and implementing business intelligence and reporting tools the City will mature into an organization that relies upon data and information to support decision-making and that analyses the data it gathers to develop insights that lead to more effective practices and cost savings.

SD5 – Connecting Field Staff with Technology

Field staff will be provided with technologies that connect them to the information they need in the field, to supervisors, office staff and customers.

SD6 – Delivering Digital Services Anytime, Anywhere

The City will extend its systems to the web to allow customers to apply, request, interact and engage with the City when, where and how they want and need to.

To advance the Corporate Technology Strategic Plan, a number of initiatives and actions are recommended over a 5 year period. Staff started the execution of the 2014 initiatives and actions, as necessary resources are in place. However, to maximize the effectiveness of the Corporate Technology Strategic Plan, the adoption of Strategic Directions is required. The Strategic Directions will enable the City to identify systems and technology improvement opportunities more strategically and to focus its resources and efforts as per the recommended timelines.

Relationship to Vaughan Vision 2020

The recommendations contained in this report are consistent with the priorities set by Council.

Specifically, the recommendations in this report support the following VaughanVision 2020 initiatives:

Demonstrate Excellence in Service Delivery – streamlined and automated business processes contribute to higher service delivery standards and alternative service delivery channels;

Ensure a High Performing Organization – streamlined and automated business processes significantly contribute to efficient operations in City departments;

Manage Corporate Assets – the Corporate Technology Strategic Plan enables effective and sustainable management of corporate information and technology assets.

Regional Implications

One of the recommendations made by the consultant is aimed at enhancing collaboration with external public organizations and agencies. The City has been working collaboratively with external organizations on initiatives such as multi-lateral data sharing, joint software license purchases and mutually beneficial projects. Further collaboration opportunities will be explored and leveraged as required.

Conclusion

The Strategic Directions contained in the attached Corporate Technology Strategic Plan will enable the City to more effectively make decisions pertaining to technology investments and respond to the City's new and emerging technology and information requirements.

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 8, 2014

Item 1, Priorities Report No. 1 – Page 5

Through a collaborative approach with the City departments and the IT Governance framework, future technology enablement opportunities will be built into departmental business plans. These opportunities will have detailed costs, resourcing requirements and associated business benefits identified and will be submitted for consideration and prioritization in future business and financial planning cycles through the Additional Resource Request (ARR) process.

Attachments

Attachment 1 – Corporate Technology Strategic Plan, Prior & Prior Associates Ltd.

Report prepared by:

Dimitri Yampolsky, Chief Information Officer (CIO) – Ext. 8352

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

VAUGHAN

memorandum

C 5
Item # 1
Report No. 1 (PK1)
Council - April 8/14

DATE: APRIL 4, 2014

TO: HONOURABLE MAYOR AND MEMBERS OF COUNCIL
SENIOR MANAGEMENT TEAM

FROM: JOHN HENRY, COMMISSIONER OF FINANCE & CITY TREASURER
JOSEPH PITTARI, COMMISSIONER OF STRATEGIC AND CORPORATE SERVICES

RE: COMMUNICATION
COUNCIL MEETING - APRIL 8, 2014

ITEM #1 - PRIORITIES AND KEY INITIATIVES COMMITTEE - MARCH 17, 2014

CORPORATE TECHNOLOGY STRATEGIC DIRECTION

Recommendation

In addition to the recommendations in the original item, the following is recommended:

1. THAT the funding requests associated with the Corporate Technology Strategic Direction be considered as part of future budget processes and in consideration with all city-wide funding requests.

Background

On March 17th, 2014, staff presented the Corporate Technology Strategy with a recommendation to approve strategic directions, which will serve as the guide for identification of technology improvements and opportunities through a collaborative approach and framework.

The report also contained a number of specific actions and preliminary cost estimates to provide an order of magnitude of the effort required to move toward the City's strategic technology goals. Inherent in strategic planning is the natural tension and balance between available resources and the timeline to realize the strategic intent. For this reason, the staff report clearly indicated that additional resources will be considered as part of the annual corporate and financial planning processes, which holistically evaluate and balance all funding priorities setting the City's multi-year budget.

To assist Council in understanding the order of magnitude associated with the actions contained within the consultant's report, a summary of the financial elements is provided based on the "High Level Roadmap", (figure 10, p. 49-50). It is recognized, the High Level Roadmap is a preliminary assessment of resources, which will change over time, including the possibility for cost mitigation through potential process realignment, resource repurposing, cost avoidance based on realized efficiencies, fluctuations in software/solutions (i.e. lower costs and technology evolves and improves), etc. However, these costs can only be identified through further detailed review and assessment.

Financial Elements of the Corporate Technology Strategic Direction

Some of the actions illustrated within the "High Level Roadmap" have been approved through past budgets or are identified in the City's budget and plan. These items and costs are highlighted for Council. There are business systems initiatives identified, which will require further review and scoping before an estimate can be determined. These items are listed separately.

The primary funding source for staffing is taxation, while corporate information technology systems can be funded by multiple sources, such as reserves, grants, capital contributions, taxation etc. As mentioned above, there is also the possibility of cost mitigation/avoidance, which cannot be identified at this time.

Overall, the Corporate Technology Strategic Direction "High Level Roadmap" has an estimated annual four year average tax increase of approximately 0.8%, excluding any items requiring further detailed scoping and presumes that all the consultant recommendations are implemented. It is important to note, this work plan is subject to change based upon detailed assessment/planning/scheduling of initiatives in terms of value and merit, funding availability, and weighting against other City priorities.

The following tables summarize the preliminary cost estimates. Specifically, Table 1 identifies costs associated with additional staffing to support existing systems/solutions (e.g. JDE) as well as new systems (e.g. EDRMS).

Table 1 – Estimated FTE Impact

High Level Road Map	2015 [3]	2016	2017	2018	
FTE Resources					
· Communications Specialist – Website Content Mgmt x 1 [1]	**$ 94,422**				
· Amanda x 1	$ 116,896				
· Data Analyst x 1	$ 116,896				
· GIS leader x 1	$ 141,648				
· CAMS x 1	$ 119,439				
· Amanda x 1	$ 119,439				
· JDE x 1	$ 119,439				
· Security Analyst x 1	$ 119,439				
· BA x 2	$ 238,878				
· Fire IT Analyst x 1	$ 119,439				
· JDE x 1		$122,130			
· CAMS x 1		$122,130			
· GIS x 1		$122,130			
· eGov leader x1		$144,890			
· BA x 1		$122,130			
· CAMS x 1			$ 124,884		
· GIS x 1 [2]			$ 124,884		
· BA x 1			$ 124,884		
· EDRMS x 2 [1]				**$276,451**	
· GIS x 1 [2]				$127,162	
Operating Cost	**$1,305,935**	**$633,410**	**$ 374,652**	**$403,613**	**AVG**
Tax Rate Increase (Estimated)	**0.8%**	**0.3%**	**0.2%**	**0.2%**	**0.4%**

Notes:

(1) 2015 Recognized ARRs

(2) in addition to the 20 FTEs

(3) 2014 positions moved to 2015

Table 2 identifies business system costs associated with existing systems/solutions (e.g. JDE) as well as new systems (e.g. EDRMS).

Table 2 – Estimated Business Systems Impact

High Level Road Map	Approved	Recognized	TBD	2014	2015	2016	2017	2018	
Business systems									
· Performance management [1]	$ 103,000								
· Asset Management [1]	$ 3,120,320								
· AMANDA [1]	$ 1,236,000								
· Mobile deployments		$ 371,140	TBD - Yr 3&4						
· POS		$ 205,700							
· JDE HR		$ 164,800	TBD - Yr 4						
· Online services		$ 463,500							
· Tax		$ 154,500							
· EDMS		$ 1,894,200							
· JDE Finance			TBD						
· CLASS replacement			TBD						
· GIS platform			TBD						
· GIS integration			TBD						
· MDM + Integration tools			TBD						
· CRM			TBD						
Taxation	**$ 603,000**	**$ 3,253,840**		**$ 603,000**	**$371,140**	**$525,000**	**$1,727,000**	**$630,700**	
Gas Tax/Reserves	**$ 3,856,320**			**$3,856,320**					
Capital Cost	**$ 4,459,320**			**$4,459,320**	**$371,140**	**$525,000**	**$1,727,000**	**$630,700**	**AVG**
Tax Rate Increase (Estimated)				**Approved**	**0.2%**	**0.3%**	**0.9%**	**0.3%**	**0.4%**

Notes:
(1) Projects are approved and underway
* Shading represents estimated timeline distribution

The resources presented in Tables 1 & 2 need to be assessed against need/value/merit/timing by the IT Governance Committee and annual planning processes as there may be differences of opinion with what was recommended by the consultant.

Report prepared by:

Jackie Macchiusi, CGA
Manager of Capital and Reserve Planning

Ellen Boudreau, MBA
Senior Budget Analyst

Respectfully submitted,

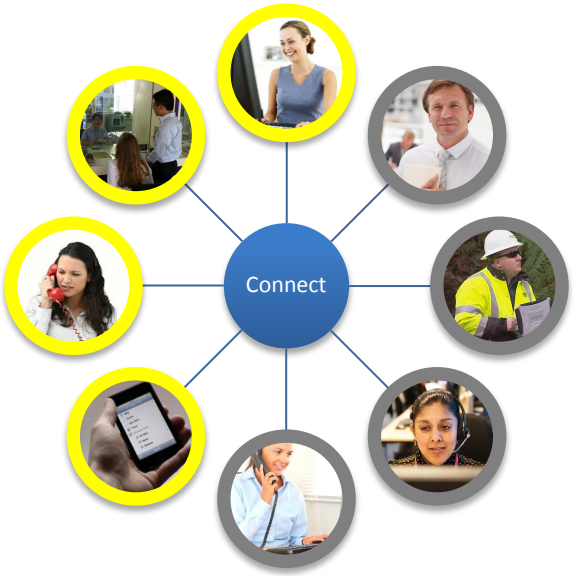
John Henry, CMA
Commissioner of Finance and City Treasurer

Joseph Pittari, MSc
Commissioner, Strategic and Corporate Services

c: Barbara Cribbett, Interim City Manager
Jeffrey Abrams, City Clerk

C 1 - COMMUNICATION
PKI - MARCH 17, 2014
ITEM 1

Corporate Technology Strategic Plan

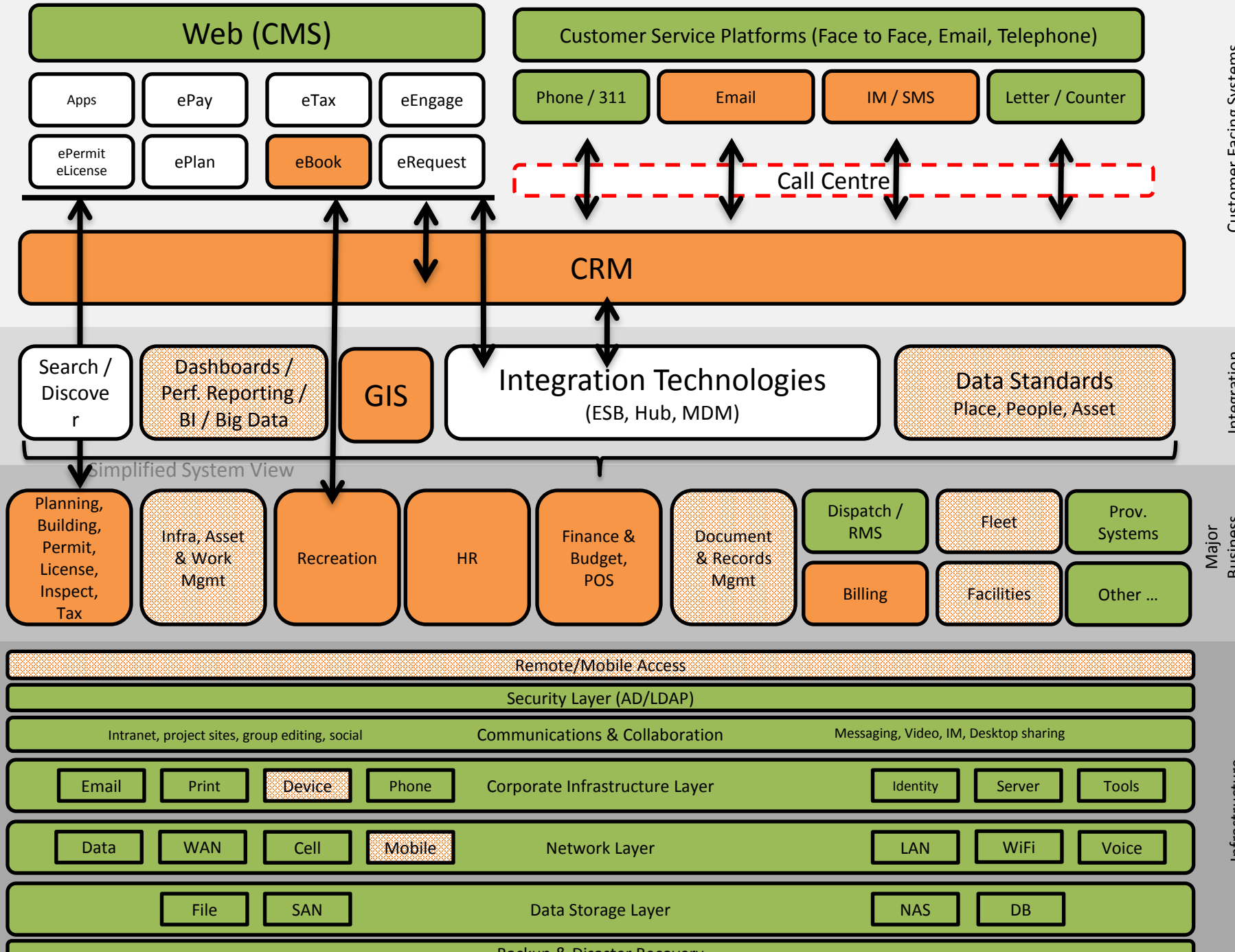


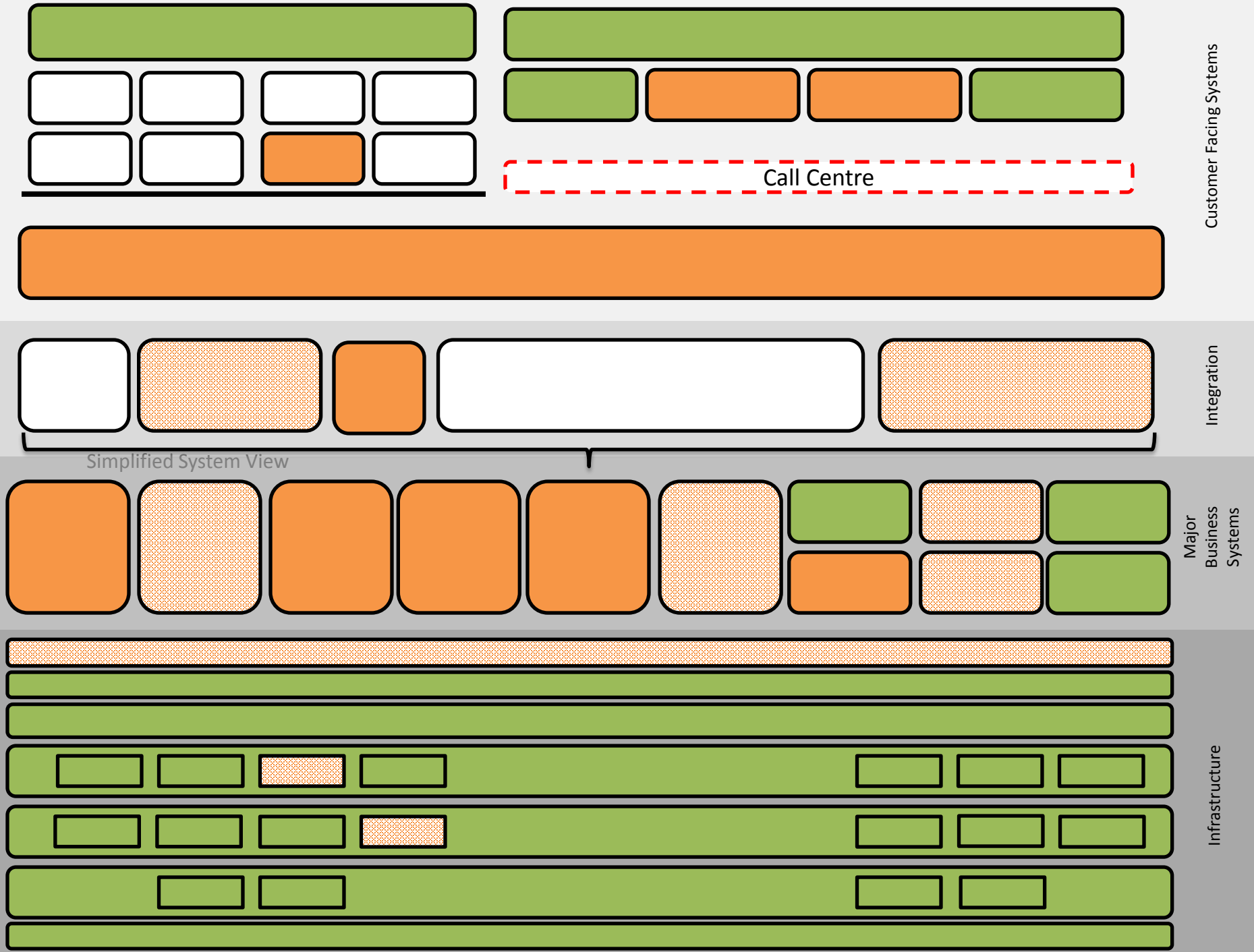
March 2014

Prior & Prior
Associates Ltd.

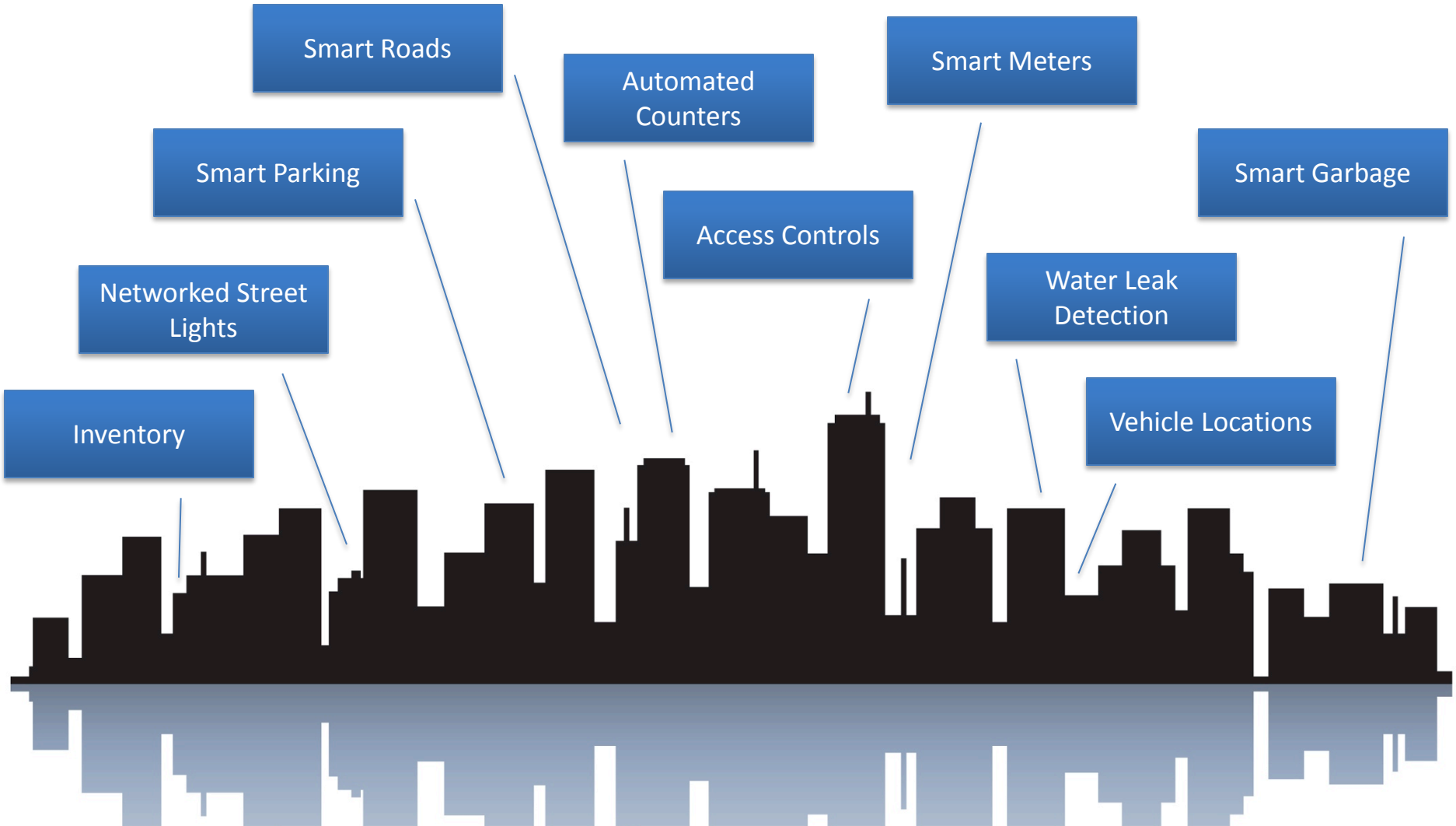
Technology Underpins Services

- Jane moves into a new home in the City. She calls the City to set up her utility payments + find out where to get a blue bin.
- Peter witnesses a minor car accident that knocks down a stop sign and wants to report it to the City
- Jenny is building a deck and needs to apply for a permit
- Fred wants to book a facility for a community meeting
- Peter works for a utility co. and needs a permit to conduct works in the roadway
- Amelia plans to open a restaurant in the City and wants to find out what permits she requires
- Kelly drives the Zamboni at Al Palladini Arena and wants to book some vacation time


Web (CMS)
Apps
ePay
eTax
eEngage
ePermit
eLicense
ePlan
eBook
eRequest
Customer Service Platforms (Face to Face, Email, Telephone)
Phone / 311
Email
IM / SMS
Letter / Counter
Call Centre
Customer Facing Systems
CRM
Search / Discover
Dashboards / Perf. Reporting / BI / Big Data
GIS
Integration Technologies
(ESB, Hub, MDM)
Data Standards
Place, People, Asset
Integration
Simplified System View
Planning, Building, Permit, License, Inspect, Tax
Infra, Asset & Work Mgmt
Recreation
HR
Finance & Budget, POS
Document & Records Mgmt
Dispatch / RMS
Billing
Fleet
Facilities
Prov. Systems
Other ...
Major Business Systems
Remote/Mobile Access
Security Layer (AD/LDAP)
Intranet, project sites, group editing, social
Communications & Collaboration
Messaging, Video, IM, Desktop sharing
Email
Print
Device
Phone
Corporate Infrastructure Layer
Identity
Server
Tools
Data
WAN
Cell
Mobile
Network Layer
LAN
WiFi
Voice
File
SAN
Data Storage Layer
NAS
DB
Backup & Disaster Recovery
Infrastructure


Call Centre
Customer Facing Systems
Integration
Simplified System View
Major Business Systems
Infrastructure

‘Smart’ Cities



Vision

Technology is integral to Vaughan's drive to become a world class City


Online Customers
Face to Face Customers
Council & Management
Common Systems
Phone Customers
Field Staff
'App' / 'Social' Customers
Back Office Staff
Customer Service Agents

Principles

Drive internal efficiency through process digitization + optimization

Offer simple customer centric services

Offer services where and when customers want them

Become a data driven organization

Strategic Directions

1. Corporate, planned approach
2. Flexible, Reliable and forward looking Infrastructure
3. Effective business systems
4. Integration and intelligence
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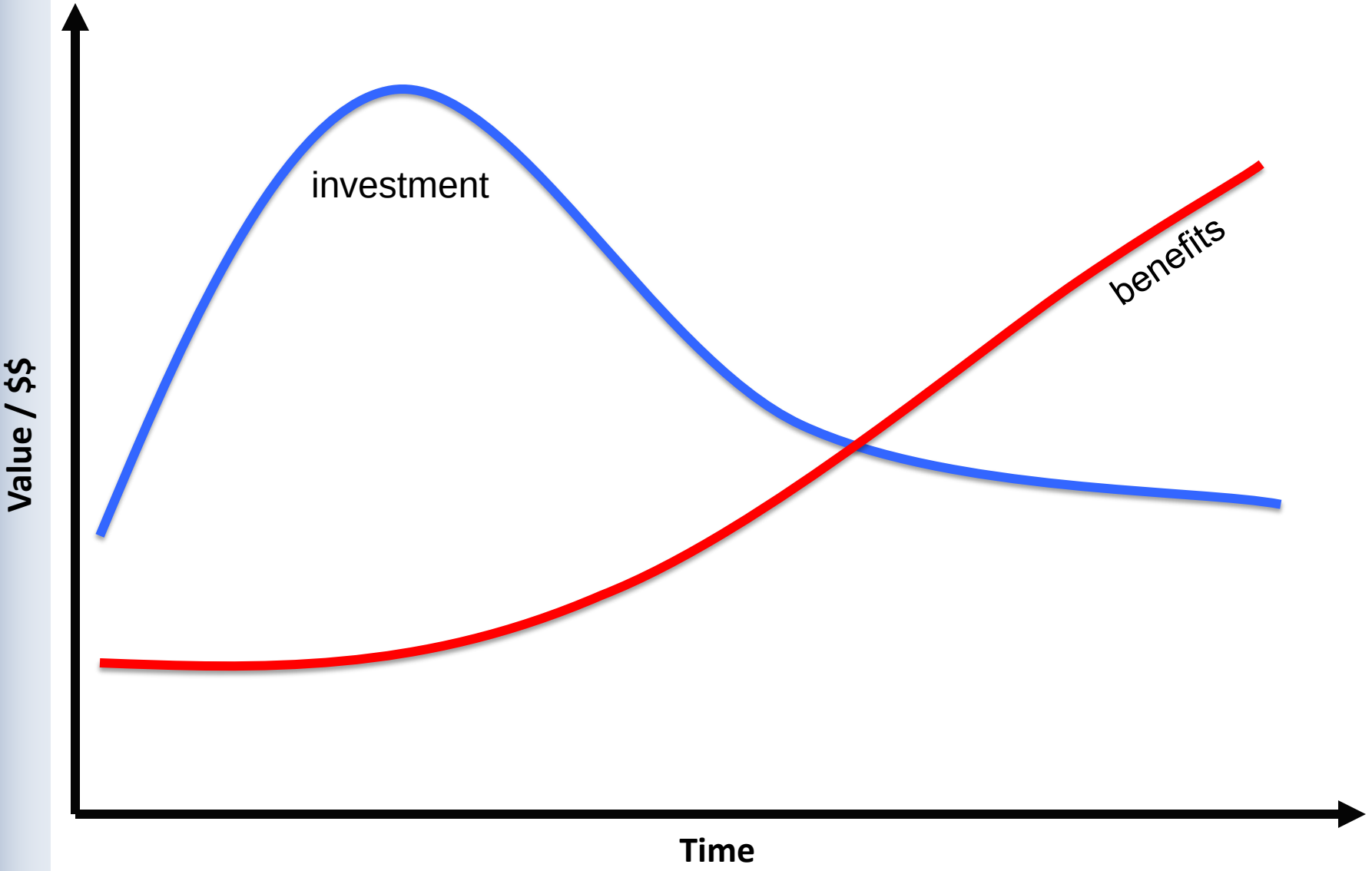
Investment = Returns



New Partnership

IT is integral to how we do business: IT organization is expected to closely partner with the business to help identify, plan and deliver significant business transformation initiatives - plus be a trusted supplier.

IT delivers critical functionality and services: IT organization is expected to deliver application projects on time and on budget, based upon the operating units requirements and priorities - plus be a solid utility.

Keep the lights on: The IT organization is expected to provide cost effective-dial tone reliability with transparent costs.

- ITM Transformation
- Stronger leadership from ITM
- Stronger business leadership

- New resources in ITM
- Business Analysts
- Extended IT Business Model

	2014	2015	2016	2017	2018
Systems	• **Performance Management** • **CAMS** • **Amanda Upgrades** • **DTA upgrade**	• JDE Finance enhancements • **CAMS** • Amanda / DTA integration / consolidation • Master data management • GIS platform	• JDE Finance • **CAMS** • JDE HRIS + • CLASS replacement • GIS integration • Mobile	• JDE HRIS + • **EDRMS** • Tax System • Online Services • Mobile	• **EDRMS** • CRM • Online Services
Strategy + Process	• New IT/IM Governance + supporting processes • GIS Strategy • Finance business strategy • JDE opportunities / fit gap • **Dev. Approvals review**	• IT policy framework • Business Analysis framework • CLASS EoL planning • Remote + mobile working strategy • HR business strategy	• eGov Strategy • Customer Service strategy + CRM review	• Ongoing refinements • TBD	• Ongoing refinements • TBD

Questions?

PRIORITIES AND KEY INITIATIVES COMMITTEE – MARCH 17, 2014

CORPORATE TECHNOLOGY STRATEGIC DIRECTION

Recommendation

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1. That the presentation by Prior & Prior Associates Ltd. be received, and;

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Contribution to Sustainability

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Economic Impact

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Specifically, the recommendations in this report support the following VaughanVision 2020 initiatives:

Demonstrate Excellence in Service Delivery – streamlined and automated business processes contribute to higher service delivery standards and alternative service delivery channels;

Ensure a High Performing Organization – streamlined and automated business processes significantly contribute to efficient operations in City departments;

Manage Corporate Assets – the Corporate Technology Strategic Plan enables effective and sustainable management of corporate information and technology assets.

Regional Implications

One of the recommendations made by the consultant is aimed at enhancing collaboration with external public organizations and agencies. The City has been working collaboratively with external organizations on initiatives such as multi-lateral data sharing, joint software license purchases and mutually beneficial projects. Further collaboration opportunities will be explored and leveraged as required.

Conclusion

The Strategic Directions contained in the attached Corporate Technology Strategic Plan will enable the City to more effectively make decisions pertaining to technology investments and respond to the City's new and emerging technology and information requirements.

Through a collaborative approach with the City departments and the IT Governance framework, future technology enablement opportunities will be built into departmental business plans. These opportunities will have detailed costs, resourcing requirements and associated business benefits identified and will be submitted for consideration and prioritization in future business and financial planning cycles through the Additional Resource Request (ARR) process.

Attachments

Attachment 1 – Corporate Technology Strategic Plan, Prior & Prior Associates Ltd.

Report prepared by:

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Respectfully submitted,

Joseph PITTARI
Commissioner,
Strategic and Corporate Services

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R E P O R T

Corporate Technology Strategic Plan

Final Report

February 2014

Table of Contents

Common Terms and Abbreviations

The following table provides a list of common abbreviations and terms used throughout this document.

Term	Description
AMANDA	System currently used in Building Standards department to manage permitting and inspections.
CAMS	Corporate Asset Management System
CIO	Chief Information Officer
CLASS	Recreation system used to manage programs, program registrations and facility bookings
Cloud or Hosted Solutions	Software and systems that run in a vendor's data centre instead of the City's data centre that are accessible to City staff or the public via the public Internet.
Consumerization	The adoption of consumer technology and devices (e.g. Facebook and iPads) in the workplace as business tools.
CRM	Customer Relationship Management System – software used by customer service agents and other City staff to manage interactions, information, and service requests with customers.
DTA	Development Tracking Application is the business system used in the Planning Department to track and manage development applications.
e-Government	e-Government (short for electronic government) refers to the digital interactions (via the web) between a government and citizens, businesses/commerce, employees and other agencies.
Enterprise Architecture or EA	An overall design or blueprint for the City's technology, data, applications and processes that encapsulates principles that can guide future IT decisions.
EDM	Enterprise Data Management program
EDRMS	Electronic Document and Records Management System
FAQ	Frequently Asked Questions
GIS	Geographic Information System – map based system that allows City staff to view data in spatial context, and to support analysis of geographic trends and patterns.
IM	Information Management – this entails organizing, retrieving, acquiring, securing, and maintaining the City's data and information resources.

Term	Description
Integration	Systems integration refers to linking together different computing systems and software applications to act as a coordinated whole.
Interface	Systems pass data between them via interfaces.
ISO27001	A globally recognized IT security best practices standard
IT Governance	IT governance deals with how IT decisions are made. The IT Governance Framework refers to the people, groups, processes, and standards that are used to govern the use and management of technology.
IT Infrastructure	IT infrastructure includes email, voice, radio and data networks, servers, personal computers, printers, and other devices. It also includes data storage, backup, and disaster recovery capabilities.
ITIL + COBIT	International best practice guidance for managing IT services.
ITM	Information Technology Management – the IT team at the City
JD Edwards or JDE	The City's Corporate ERP used to manage Financial processes and reporting.
Portal or CMS	Content Management System – system used to manage content and services on the City's web portals. The City uses SharePoint as its corporate portal solution.
POS	Point of Sale System – cashiering system for receipting cash and issuing receipts.
Remote / Mobile	Ability to access City computing resources (e.g. email, applications) via remote connection, either from home or from various devices available in the field / on the road.

Executive Summary

Technology is a Key Enabler of the City's Strategic Goals

Vaughan Vision 2020 sets the City's strategic goals as Service Excellence, Organizational Excellence, and Staff Excellence. These goals in turn drive objectives of productivity, cost effectiveness and innovation alongside citizen-centric, efficient, and effective service delivery. The central theme is effectiveness – being the best the City can be during a period of significant and exponential change.

Well-run cities around the globe rely on their *systems* to be effective. *Systems* in this context are their business processes, technology, and business solutions that support them. The larger cities get, the more reliant they become on process automation to facilitate large volumes of requests, to ensure service delivery consistency and to manage teams and resources effectively.

Today, the most effective municipalities are designing their processes and engagement mechanisms from their client's perspective – making them easy to access and convenient to use. They build digital processes so that they can meet customer expectations for access to City services to be available online, on the go and 24-7.

In these organizations technology underpins everything the municipality does – they simply cannot function without IT services for even short periods. Moreover, this reliance on technology is set to grow. In the near future the growth of sensors and other technologies will mean that a wide range of systems not previously attached to the network; from traffic light management to real-time traffic monitoring, from parking management systems to water leak detection, will rely on access to networks and computing resources.

Ultimately municipalities that can effectively manage their processes and understand their data will be far better able to allocate resources effectively and make smart decisions.

The City of Vaughan strives to be this type of organization. Therefore, technology, systems, processes, and effective information management must be central to the City's plan to achieve its goals and objectives.

Current State

To date the City's investments in technology have established solid technical infrastructure. These foundations are essential for delivering effective services.

However, given the significant change and growth in recent years, the City has had limited ability to proactively and, strategically focus sufficient attention and resources toward its systems: the processes and business systems that run the City. Although numerous business systems have been implemented, many of the City's processes, including procurement, invoice and payables processing, staff time and attendance

tracking, permitting and licensing remain largely paper-based. This makes them difficult to manage efficiently, to apply appropriate controls to, or to offer online.

The current lack of systems maturity inhibits the City's ability to be more effective and efficient.

Future State & Strategic Directions

This strategy provides the opportunity for the City's leadership to recognize this issue and place greater value upon technology and systems in future. The City's systems must evolve and mature for the City to be as effective as it can be, for it to offer services in the way that customers want them, and for it to keep pace with competing municipalities.

At the heart of the strategy is a single overarching direction:

SD1: The City must adopt **a more corporate, planned approach.** The City must tackle larger and strategic, enterprise challenges, rather than small, interim, and incremental projects. An Enterprise Architecture that provides a blueprint for a fully integrated technology environment will guide this new approach.

Five further strategic directions support this overarching one:

SD2: Flexible, Reliable and Forward Looking IT Infrastructure: The City's ITM team will continue to provide high quality, reliable infrastructure services as cost-effectively and at best value for the City. Taking advantage of new technologies, infrastructure will be designed to be flexible and scalable to meet future needs. ITM will closely monitor industry trends and be ready to embrace new technologies that add value to the City more rapidly than in the past.

SD3: Building Effective Business Systems: The City will focus upon setting business goals and strategy, and on business process redesign and optimization, before deploying integrated technologies or enhancing existing ones. The City will commit to fully leveraging its existing business systems – this means maximizing use and driving greater value from business systems, such as JD Edwards, Amanda and the GIS. The City will also implement new business systems to address gaps in the systems architecture such as Asset Management, Point of Sale, and EDRMS.

SD4: Integration and Intelligence: By digitizing processes, improving its data management practices and implementing business intelligence and reporting tools the City will mature into an organization that relies upon data and information to support decision-making and that analyses the data it gathers to develop insights that lead to more effective practices and cost savings.

SD5: Connecting Field Staff with Technology: Field staff will be provided with technologies that connect them to the information they need in the field, to supervisors, office staff and customers.

SD6: Delivering Digital Services Anytime, Anywhere: The City will extend its systems to the web to allow customers to apply, request, interact and engage with the City when, where and how they want and need to.

What Will It Take?

The changes recommended are significant. Moving to a corporate, enterprise focused approach, from a piecemeal, departmental led one will require commitment from all levels of the organization. Council, Senior Management Team, business leaders, and ITM must work more closely together, *as partners,* to deliver on these strategic directions. To facilitate the stronger partnership a new integrated Information Technology and Information Management governance framework is proposed.

Additionally, the City will need to make significant investments in existing and new technologies to address gaps in its systems architecture and take advantage of untapped potential in existing systems. The City will also need to make investments in new staff and skills required to implement, operate, and grow those business solutions so that the City can effectively leverage the systems it implements.

The strategy's major future directions are:

1. Adopt a planned, collaborative and corporate approach to technology
2. Strengthen corporate IT governance through a combined corporate Information Technology and Information Management governance model
3. Adopt an Enterprise Architecture (EA) and implement mechanisms to embed the Enterprise Architecture principles within the City's decision making processes
4. Enhance existing IT governance processes to establish a robust technology project justification process, and develop mechanisms to enable effective management of the technology portfolio including project prioritization, financial planning and resource management
5. Ensure technology is embedded within each department's business strategy by requiring all departmental business plans to address technology needs
6. Use ICI to facilitate the setting of business strategies in corporate wide business process areas (e.g. HR, Finance, Procurement, Planning)
7. Ensure that holistic systems thinking and process redesign occurs before technology implementation by redesigning project methodologies, developing a business analysis framework and establishing new roles for business analysts
8. Review each of the major enterprise business systems to identify opportunities to fully leverage these systems and develop multi-year roadmaps to address major opportunities
9. Execute projects to enhance existing enterprise business systems including JD Edwards, Planning/Building/Licensing solution, ESRI GIS to fully leverage process digitization and automation
10. Implement major new business systems to address future business needs, including major systems for asset and work management, fleet and facilities management, cashiering, EDRMS

11. Develop a GIS strategy to establish the future direction for a strong corporate GIS service
12. Review and renew the City's e-Government strategy and implement a range of new online services
13. Ensure additional resource funding for all new technology projects and initiatives are included as part of the project funding request
14. Increase the City's IT complement, with a focus upon providing leadership, support and growth for major corporate business systems through established business and financial planning framework

These recommendations should be implemented as a package. Picking and choosing individual recommendations will not be effective in transforming the City's approach and culture, which is what is required.

Outcomes

By accepting this strategy and implementing the recommendations, the City will begin to see significant improvements in its overall effectiveness and efficiency. It will also realize more value from existing IT investments by leveraging more from such systems (e.g. JDE).

Investments recommended by the strategy will mean more effective digital processes that simplify customer access and accelerate processing times, that reduce errors and cut staff time spent on low value administrative work. It will also lead to new online services that reduce unnecessary trips and calls to City Hall and that increase citizen satisfaction and engagement. Data driven insights into the City's performance, enabled by IT investments, will drive continuous improvement and enhanced cost effectiveness.

These significant benefits aside, by establishing a senior led partnership approach that focuses upon business process, technology and information management, the City will integrate systems thinking into the fabric of the organization, which will drive cost savings and avoidances through optimization for decades to come.

If, however, the City fails to accept the recommendations, and decides not to take action, it will actively undermine its ability to achieve the strategic goals it has set itself. It will position itself poorly to meet customers' expectations of service excellence, and it will hamper the City's ability to scale its service delivery efficiently as growth accelerates.

1. Introduction

1.1 The Importance of Technology

Today, all organizations rely on technology; whether a firm is in the business of delivering packages, selling products or providing healthcare – people, process, and **technology** need to work together for those services to be delivered effectively.

Municipalities are no different. Technology is central, and becoming ever more so, to the City's ability to deliver its services. City services ranging from collecting taxes, to managing traffic flows, from distributing water, to managing registrations for recreation programs are dependent upon technology to operate safely and effectively. Back office systems that help staff track cases and manage requests; monitor budgets and track performance are critical tools that can enable the effective operation of the City. Email and smartphones keep every part of the organization connected and communicating.

1.2 The Importance of IT Strategy

Given the importance of technology, and the role it plays in facilitating the delivery of City services, and particularly in the municipal setting, where there are so many competing demands, an IT strategy is critically important. It provides an opportunity to consider:

- Are we doing the right things with technology?
- Are we making the right technology investments?
- Is our Information Technology environment properly managed, maintained, secured, able to support the clients, and is it cost effective?
- What are our future business needs?
- Can our technology environment support our current and future business needs?

Crucially it allows the City to determine the strategic priorities, and set out the key initiatives and activities that will be critical to supporting the City's business goals and objectives.

1.3 Developing this Strategy

The City engaged Prior & Prior Associates to collaboratively develop this strategy in the summer of 2013. Prior & Prior worked with the ITM management team, representatives from all departments and the Senior Management Team to conduct a current state assessment of the City's use and management of technology, and to identify future corporate and departmental technology needs. Armed with these findings the consultant worked with the CIO and ITM team to identify strategic priorities and directions, and to develop this document – the five-year Corporate Technology Strategic Plan.

1.4 Approach and Methodology

The approach to developing the strategy involved the following steps.

- A review of existing corporate strategies and plans

- A review of the City's IT organization and processes
- One on one interviews with the CIO and the ITM management team
- Group meetings with Directors, Managers and staff, including interviews with representatives from the following business units:
    - Recreation & Culture
    - Parks and Forestry
    - Finance
    - Clerks & Legal
    - Enforcement
    - Engineering
    - Development / Transportation Engineering
    - Public Works
    - Planning
    - Policy Planning
    - Building
    - Innovation & Continuous Improvement
    - HR
    - Environmental Sustainability
    - Access Vaughan
    - Corp Communications
    - Internal Audit
- One on one meetings with the City Manager and Commissioners
    - Interim City Manager, Barbara Cribbett
    - Commissioner of Strategic and Corporate Services, Joseph Pittari
    - Commissioner of Community Services
    - Commissioner of Legal and Administrative Services, MaryLee Farrugia
    - Commissioner of Engineering and Public Works, Paul Jankowski
    - Commissioner of Planning, John Mackenzie
    - Acting Commissioner of Finance & City Treasurer, John Henry
- Findings report/presentation prepared by Consultant
- Findings reviewed and refined with CIO, ITM Management team and Commissioner of Strategic and Corporate Services
- Findings presented and IT strategic directions discussion with IT Governance Committee
- Findings presented and IT strategic directions discussion with SMT and Directors
- Draft strategy developed by Consultant
- Draft review and revisions with ITM Management Team, Commissioner of Strategic and Corporate Services
- Draft Strategy presented to SMT and committee of Council.

1.5 Timelines

The project began in June 2013 with interviews with ITM leadership and staff. Group meetings with representatives from each department were conducted during July and August 2013. Generally, these meetings involved the director of the department and managers and staff selected by the director. Meetings with the Interim City Manager and each Commissioner were held, after departmental interviews were completed, also in August. The consultant's findings were presented and iteratively reviewed with the CIO, ITM Management team and senior management during September and October. This final strategy document, including the key recommendations and implementation plan was developed between October 2013 and January 2014.

2. Current Situation Assessment

Understanding where the City stands today with respect to its technology environment, and its technology management practices is the starting point for the strategy.

2.1 Technology Environment Assessment

Prior & Prior's standardized municipal technology architecture was the basis for evaluating the City's technology environment.[1] The assessment was conducted by the consultant and validated with the CIO and IT governance committee. Figure 1 (over the page) visually illustrates the results of the assessment.

Starting at the base of the architecture (the **Infrastructure** layer) the assessment indicates that, although some enhancements are required, generally the City has established solid infrastructure foundations that will support the City's future needs and goals.

Working upwards through the architecture the City is not as well positioned.

The Major Business Systems layer highlights the greatest opportunities for business systems automation, requiring focused approach and significant work. The City needs to address gaps in the major business systems layer, through existing systems renewal (JDE and AMANDA/DTA) and by implementing major new corporate systems (such as Corporate Asset Management systems).

The **Integration** layer also features a number of key gaps. While an Enterprise Data Management program is underway, it is early in its development, with much work yet to be done. The GIS is in poor shape corporately and there is almost no business systems integration.

The **Customer Facing** layer illustrates that while the City has implemented a Corporate Portal and new website, there still remains significant opportunity to deliver online/digital services (e.g. permitting, licensing and service requests) via the portal. In addition, the City will likely need to replace its CRM system in the course of the next five years.

[1] The architecture presented here will be used as a future state architecture for the City. It is discussed in more detail in section 3.

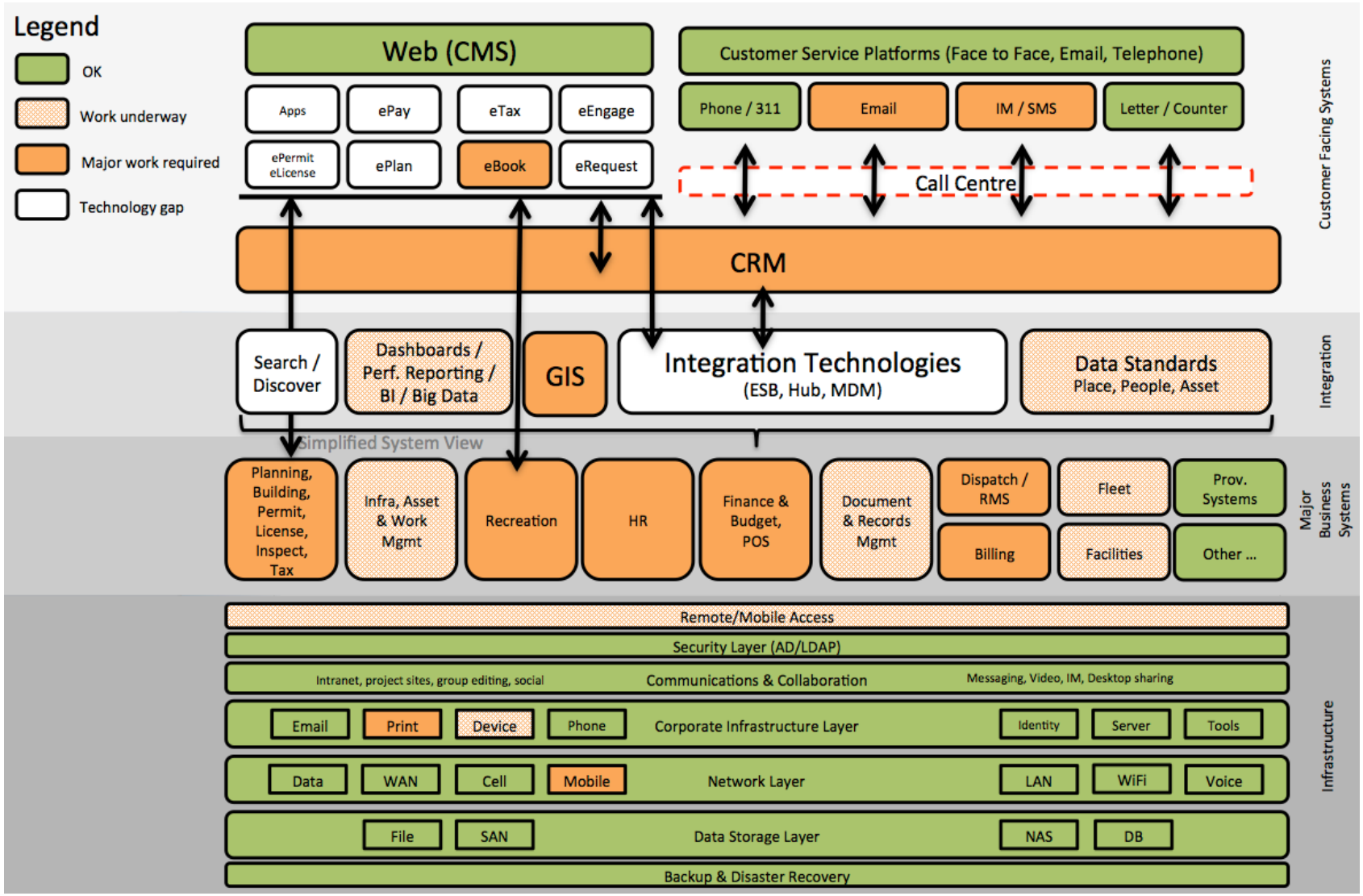


Figure 1: Current state assessment against Enterprise Architecture

The following table presents the rationale for those areas that are assessed as 'requiring major work'.

Area	Issue
Remote / mobile	The City needs a comprehensive strategy to support remote access to business systems for office-based staff and to provide access to business systems for mobile workers that operate in the field.
Planning, building, permit, license, inspect, tax	Planning, permitting, licensing, and inspections are currently managed across multiple systems – creating inefficient processes and unnecessary complexity. A rationalized approach around a single corporate system will connect processes together and lower the City's overall cost of systems ownership (the City plans to complete a functional / needs assessment in 2014). The City is also currently considering whether to replace its tax management solution (Vailtech).
Infrastructure, asset and work management	The current work order system in JDE will not support the City's future Asset Management requirements. The City plans to implement a corporate work management system, the fixed asset module in JDE and asset lifecycle management and planning systems as part of its Corporate Asset Management program.
Recreation, e-Booking	The CLASS system, used for recreation program management, has been declared end of life by the vendor with a sunset date in 2016. This is a key system that is used by tens of thousands residents each registration session. The City must determine its future strategy and implement a replacement for this system.
HR	The City does not have an effective integrated HR system that can manage core functions such as; employee data, time and attendance, employee + manager self-service, performance management.
Finance, budget and POS	There are basic functions and untapped potential within JDE that could streamline processes and implement automated controls that are much needed. Furthermore, some areas of the system have not been revisited since the original implementation. Areas that require significant improvement include; GL redesign, AP and fixed asset module implementation, procurement automation, improved real-time reporting and the implementation of business system interfaces. Enhancements to budget systems, JDE integration are also required. In addition, the City must implement a Point of Sale / Cashiering solution.
Document & records management	The City has concluded a detailed investigation and business case for implementing an EDRMS solution. The report recommends the implementation of an EDRMS.
Dispatch, RMS	Dispatch services from YRPS are effective, however the City's fire service has identified a number of opportunities to significantly improve its record management processes, including; inspection management, investigations and pre-planning.
Billing	Powerstream primarily handles the City's billing, and they are currently implementing a new Customer Information and Billing system. The City wishes to implement flexible billing, tiered rates, storm water billing and online billing. It will need to determine a strategy to achieve these goals – whether to use services from Powerstream, other providers, or bring

Area	Issue
	services in-house. The chosen strategy will determine future technology requirements.
Fleet	The City does not currently have a fleet management system. The City will assess whether the implementation of a fleet system could be a component of the overall Asset Management program, or whether a standalone solution is required. Given the rationalization imperative outlined in the remainder of the strategy the City should first consider a shared CAM solution.
Facilities	The City does not currently have a facilities management system. The City will assess whether the implementation of a facilities system could be a component of the overall Asset Management program, or whether a standalone solution is required. Given the rationalization imperative outlined in the remainder of the strategy the City should first consider a shared CAM solution.
Dashboards, performance reporting, Business Intelligence (BI), big data	The City is preparing to implement a performance management solution that will address the City's ability to measures and report on key metrics and KPIs. Future more expansive business intelligence and analytics initiatives may focus on other activities such as corporate wide queries and analysis, alerts, data mining, text mining, and forecasting. The City should expect to implement additional corporate BI solutions in due course.
Data standards	The City is in the early stages of developing the Enterprise Data Management program. This program will set data standards and implement master data management strategies for key datasets.
GIS	The City's GIS capabilities are limited due to a fragmented departmental approach and a lack of corporate leadership. Although the City's GIS platform is in place (ORACLE Spatial, ESRI), it lacks consistent standards, clear roles around data ownership, business, and functional requirements for GIS-enabled applications. The City will conduct a review and develop a corporate GIS strategy to set the future strategy, formalize the corporate GIS technology and data platform, and build internal skills and capabilities.
CRM Email / IM / SMS	The City uses JDE as a customer relationship management or case management system in Access Vaughan. There are limitations to this system that, as the City's customer service delivery matures, may need to be addressed. Other municipalities have implemented dedicated CRM solutions, which the City may also wish to consider. Dedicated CRM solutions offer more sophisticated capabilities, better systems integration, and support new customer interaction channels including email, instant message, and SMS.

It is clear that a number of significant areas require major work. The business systems layer will be an area of intense activity over the next five years. Many new business systems must be implemented and existing systems enhanced. Work in the integration layer will also be important to establishing the foundations for efficient and effective business processes.

2.2 Technology Management Practices Assessment

In reviewing the City's technology management approach, a number of positive aspects were noted including:

- The City's core IT services and IT infrastructure, for example PC provision, network, email services and the helpdesk are well managed by ITM, are reliable and perform well
- The City's ITM team has rightly adopted a number of industry standards and best practices (ITIL and PMI) that result in repeatable and effective processes (e.g. helpdesk and project management)
- The City's ITM team has recently undergone a reorganization designed to increase its focus on enterprise business systems and to improve the team's interactions with internal customers – this is the right direction, that sets the tone for stronger business-ITM partnerships in the future
- The City has recently implemented a corporate IT governance committee to coordinate strategic IT activity. This is a recommended best practice.
- The City has introduced important Corporate and ITM programs such as Security and Enterprise Data Management that are central to more effective leverage of technology
- Finally, it appears that there is an increasing awareness of the importance of technology at SMT, and a recognition that significant gaps exist in the current environment.

However, some key areas were identified as important challenges that the City must address.

BUSINESS SYSTEMS

- Although the City has implemented business systems with the capability to automate business processes, many of these capabilities have not been utilized. As a result, the City still operates and continues to implement inefficient and paper driven business processes that could be more effective if they were automated.
- Numerous opportunities for business system integration exist that will save staff time, eliminate errors, and increase the speed of handling.

GOVERNANCE

- The historical department-led or piecemeal approach to IT decision-making and sourcing has led to a fragmented and siloed application architecture. This has and will continue to inhibit corporate capabilities and create barriers to effective business processes unless addressed.
- The City does not appear to be selecting the projects that drive out the greatest value to the organization.
- ITM and business resources are frequently directed to short-term technology solutions while major corporate IT projects that will deliver greater value remain un-resourced.

RESOURCES

- The City has insufficient technology resources, particularly to sustain and grow large corporate solutions that can be much more broadly utilized. For instance, a single FTE dedicated to the support of JDE is insufficient to allow the City to leverage JDE's true capabilities.
- Over 80% of the City's ITM team time is spent 'keeping the lights on', rather than extending business capabilities.
- The City lacks key resources, skills, and most importantly corporate leadership in the areas of Business Analysis, GIS, Web and e-Government Services.

2.3 New Pressures

The City must also take into account new or emerging factors that will affect the City's business and IT strategic direction.

Growth is clearly a major factor that will affect the City over the coming years:

- **Some existing City practices will not scale.** As the City grows it simply becomes impossible for paper and knowledge-based processes to be effective at coordinating activities and sharing information, across larger teams, more projects and more cases. To scale to support the City's growth requires digitized, integrated systems that the City does not currently have in place.
- **Growth means increasing complexity.** As the City moves toward intensification and full urbanization, the complexity of the issues the City deals with will grow. Accordingly, the importance of integrated planning and coordination across departments and agencies will grow. Technology will play an important part in this area.
- **Pressure on core services.** All departments are reliant on HR and Financial processes to be effective in discharging their responsibilities. Paper based time and attendance recording and purchasing processes inhibit City department's ability to move at the speed they need, while balancing corporate controls. These core services, used by all City departments, must be efficient, effective and operate in real-time if the City is to be effective.

Furthermore, the following factors must also be considered:

- **Changing customer expectations.** Customers expect to be able to interact with the City electronically, when they want, where they want. Processes in the back office must be digitized so that they can be offered electronically to customers.
- **Everything is becoming digital.** New technologies are constantly emerging that are transforming everyday 'dumb' devices into smart devices on the network. Today traffic lights and building security controls, garbage trucks and irrigation systems, and even the garbage cans themselves are becoming smart devices that connect to the City's technology infrastructure. These devices connect to databases and systems that allow staff to manage their operation more effectively and efficiently than in the past.

- **Continuous improvement relies on operating insights.** The City is investing in continuous improvement. Digitization of processes ensures that data is available to provide insights that can enable benchmarking and spark continuous improvement of operations.

2.4 What Needs to Change

Ultimately the assessment of the current state identifies a number of specific technologies and solutions that the City must renew or implement. However, together the assessment and the future pressures also point to three more significant changes the City must make with respect to its approach to technology:

1. The City must focus on *systems* - the combination of processes and business systems - as the driver of efficiency and effectiveness
2. The City must establish a strengthened corporately led governance of technology and information management to drive effective technology choices
3. The City requires new investments in technology, process design and management alongside resources with new skillsets to lead and execute these changes

2.5 What Should the Future State Look Like?

This plan is designed to transition the City from its current state to a desired state that better positions the City for the future. The transition is shown in Figure 2.

Current State	Future State
Interim and low value solutions	Tackling the big challenges that establish platforms for long term benefits and rewards
Competing and diverse interests	Technology Strategy and Enterprise Architecture provide a shared vision for technology utilization and mechanisms to ensure continued compliance
Department driven, not coordinated enterprise driven decision making	Collaborative decision making through shared IM and IT governance model supports the aligned and longer-term view.
Untapped capabilities of large potentially cross-corporate systems	Fully integrated corporate solutions with re-engineered processes based on best practices that support streamlined City services
Systems maintained as ledger based, historical tracking	System used as modern business process management tools to automate workflows and tasks
Limited data integration with a heavy reliance on manual data processing	Core systems are fully integrated, reducing manual workloads, errors and delays
Limited access to real-time, insightful data	Data standards, integration and BI capabilities simplify reporting and data analysis

Current State	Future State
Reliable and resilient infrastructure	Reliable, flexible, agile infrastructure that quickly embraces new tech supports current and future needs.
Limited collaboration capabilities	Tools that facilitate effective communications and collaboration
Few online services	Full suite of integrated, end-to-end digital services
Paper based field work processes, rely on manual data processing in the back office	Mobilized staff and crews can track and handle work in real-time in the field

Figure 2: Current to Future State

3. A Technology Enabled Vision for the Future

Smart cities around the world are tech-savvy – they rely on technology to make them better places to live and work, and to make them more efficient and effective. For Vaughan to become a world-class city, it must make technology central to its vision for the future.

3.1 IT Strategic Vision

It is recommended that the City adopts an IT strategic vision that sets technology as being integral to Vaughan's drive to become a world class City.

3.2 IT Strategic Goal

CONNECTING PEOPLE & THINGS

The City's use of technology is designed to *connect people* – customers, staff, and management – in seamless workflows that simplify access to services for customers, and simplify task management for staff.

Figure 3: Connecting people through common systems

This means breaking down departmental boundaries and barriers in the pursuit of service excellence. By connecting people, the City can offer seamless services that delight customers and make the City more effective. For example:

- **Enabling customers to carry out full transactions online for City services**, i.e. applying for permits, licenses or development approvals or requesting a parking consideration. For example in the building permitting area; by using systems that connect customers, back office staff and inspectors, ongoing case management tasks such as submitting revised drawings or reviewing inspection results can happen electronically. This simplifies and speeds processes, eliminates unnecessary visits to City Hall and reduces time spent following upon the status of a permit.
- **Providing tools for customers to notify the City of a problem, or raise a service request with the City via their smartphone**. For example a concerned citizen notifies the City via the website that a Stop sign has been knocked down. The request is received and automatically routed to the nearest crew in the field. The crew handles the request, marks the request as closed and the system automatically alerts the customer when the problem is resolved. Delivering services in this way helps citizens be active partners in maintaining their City and keeping it safe.

Beyond connecting people together and enabling streamlined customer interactions, another set of connections is important to the future of the smart city. The term 'the Internet of things', refers to the explosion in the number of devices and sensors that is anticipated to emerge over the coming years. The City needs to be ready, first to connect these devices to its network, and second to be able to handle and analyze the vast amounts of data that each of the devices will generate.

3.3 Guiding Principles

To achieve this vision and goals the City will adopt the following guiding principles

A. Drive Internal Efficiency through Process Digitization & Optimization

Smart investments in corporate technologies, that drive productivity, can offset increases in operating cost that the City faces because of growth.

To achieve this the City will need to extend existing systems and implement new business systems to automate workflows, simplify tasks and enable staff between departments to collaborate effectively. This will mean re-thinking the way the City does things and applying optimization techniques to ensure that each of its more than a thousand processes are as effective as they can be.

B. Offer Simple, Customer Centric Services

The City will also seek to make its processes and systems more customer friendly and easier to access. Processes will be designed from the customer's point of view and not the City's. Departmental siloes will be broken down through process rationalization.

C. Offer Services where and when Customers Want them

Municipal services are rightly compared with other service sector services, such as banking and insurance, where customers now expect and demand increased convenience. The City will push its services online so that customers can self serve, ask questions, make service requests, apply for permits and licenses, and make bookings online.

D. Become a Data Driven Organization

The City's goal is to establish a data rich environment that allows management and staff to better understand how the City works. By analyzing data the City aims to identify trends and patterns, test assumptions and model scenarios with the objective of improving services and increasing cost effectiveness. The goal is to ensure that all key decisions the City makes can be supported by data.

3.4 Strategic Directions

To achieve the vision and goals presented, the strategy recommends the following strategic directions:

Strategic Direction 1: A Corporate, Designed Approach

Strategic Direction 2: Flexible, Reliable, and Forward Looking IT Infrastructure

Strategic Direction 3: Building Effective Business Systems

Strategic Direction 4: Integration and Intelligence

Strategic Direction 5: Connecting Field Staff with Technology

Strategic Direction 6: Delivering Digital Services Anytime, Anywhere

The remainder of this document outlines the recommended strategic technology directions, and identifies other changes the City must implement to facilitate their implementation.

4. SD1: A Corporate, Designed Approach

Central to achieving the goal of *connecting people* is the need to join-up processes and thinking across departmental boundaries.

4.1 Evolution vs. Design

The fundamental problem that the City faces today in connecting people is that its systems – the processes and the software that supports them – were never explicitly *designed*. The systems have evolved in a piecemeal, ad-hoc way as the City has grown.

Where systems have been automated – manual, paper based systems have been enhanced with Excel spreadsheets, then replaced with an Access database. In some cases a business system, or multiple systems, have replaced the Access database. When new business problems or challenges emerge, new business systems have been added. Moreover, because of the piecemeal approach, often solutions that are designed to simplify processes in one department add complexity and overhead for staff in other departments.

While things work, the City's systems are not as effective as they could be. Users frequently have to access multiple systems to do their jobs. No one system can provide the complete view. Rather than simplifying the entire process, parts processes are automated, while other parts are not. Without an integrated approach, the result is disjointed, disconnected processes that make it harder for staff to do their jobs.

To be more effective the City must adopt a more holistic view of its systems. The City must step back, rethink, and redesign many of its systems, such as staff time and attendance, or purchasing, from a complete, end-to-end perspective – so that the process serves the whole corporation's needs – not those of one department or team.

4.2 Enterprise Architecture

One measure designed to help is the adoption of Enterprise Architecture – a design, or target state, for the City's technology environment. This will help the City pursue a more coordinated, designed and corporate approach to systems, an approach that focuses more upon standardization of technologies and business processes, than on individual wants and needs of departments.

The Enterprise Architecture provides the blueprint to guide the City as it makes decisions about technology. The Enterprise Architecture that the City will adopt is represented in Figure 4 (over the page). The diagram presents the architecture visually – the key concepts of the architecture are described in more detail in Appendix 1.

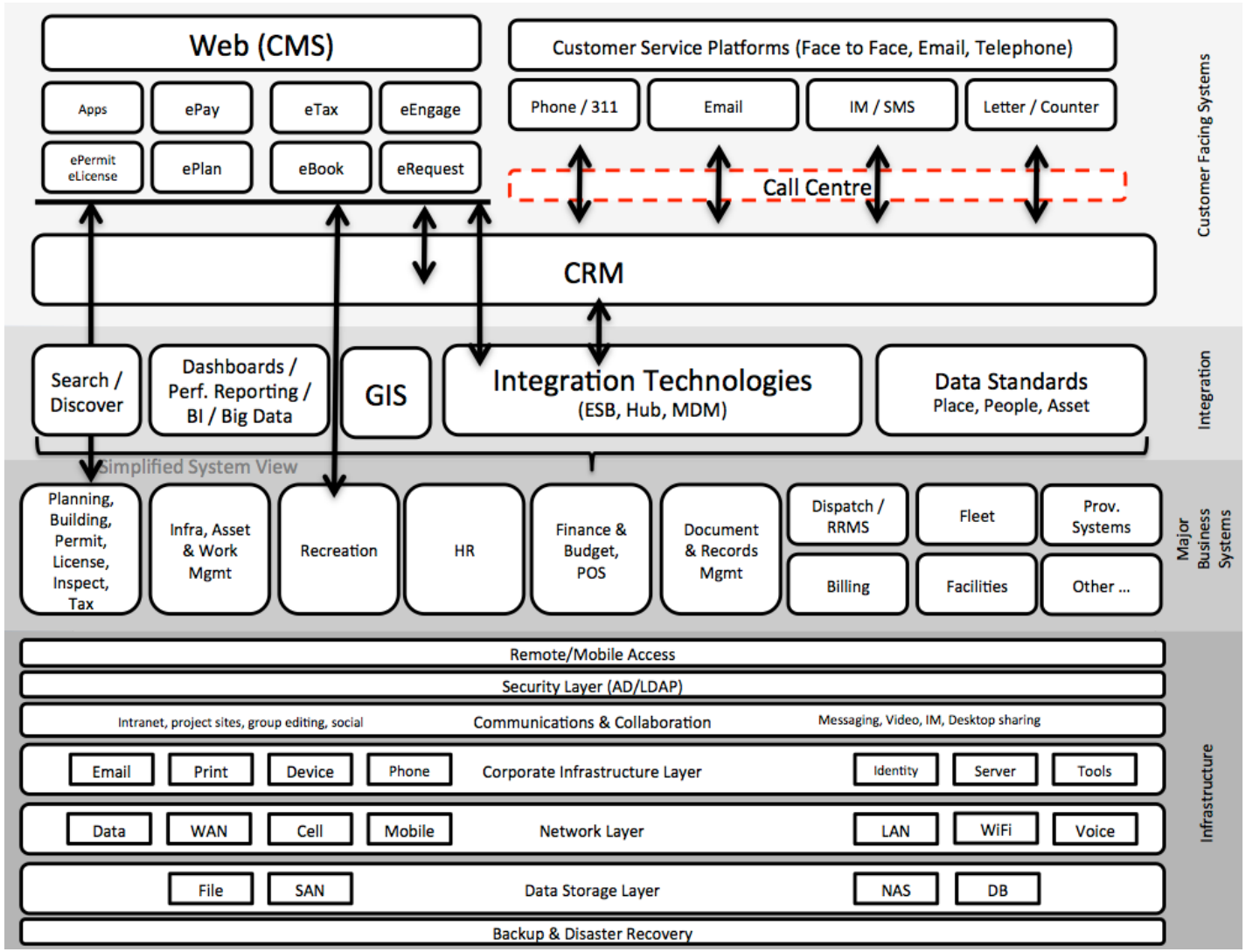


Figure 4: Enterprise Architecture

The two most important concepts that the Architecture represents for the City are:

- A business systems architecture that is built around a small number of major corporate business systems that are used to manage common business processes, and
- The importance of building from the bottom upward – establishing solid infrastructure, followed by the business systems layer, and so forth.

The Enterprise Architecture has been reviewed and endorsed in principle by ITM and SMT. It will continue to evolve and be refined over time through the IT Governance Committee. The concepts that are represented will be built into the 'rules and tools' that support technology decision-making at the City.

4.3 Lifecycles, Plans, Strategies and Roadmaps

Each of the elements in the Enterprise Architecture requires discrete tactical plans, roadmaps, and longer-term strategies. The City will put in place and maintain 1, 3 and 5-year plans for each of the elements so that it is better positioned to coordinate planning of activities that impact more than one element in the EA. Furthermore, ITM should maintain an overarching lifecycle management plan as illustrated in the example below:

	PROTOTYPE			MATURE			SUNSET			Bypass
	1	2	3	4	5	6	7	8	9	0
Phone					VOIP				?BX	
Cell				Android 4.x	Blackberry, iPhone, WinPhone					Android 3.x
Cell phone	SharePoint 2013				Sharepoint 2010				Sharepoint 2003	Sharepoint 2007
Tablet			Surface	iPad						Playbook
Integration		Biztalk								
Desktop	Windows 8.1				Windows 7				Windows XP	Vista, Windows 8
Fax		iFax					Fax (analog)			
Network									Cisco VPN	
Office	Office 2013				Office 2010			Office 2003		
Server			W2012 R2			W2008 R2		W2003 R2	W2K	W2008, W2012
SQL DB		SQL 2012			SQL 2008 R2			SQL 2005	SQL 2000	
Oracle DB					Oracle 11			Oracle 10	Oracle 9	
Programming	.net 4.5				.net 4.0			.net 3.0	.net 1.0 + 2.0	
GIS		ArcGIS 10.2			ArcGIS 10.1			MapInfo, ArcGIS 9.x	ArcGIS 8.x	ArcGIS 10.0
Filesharing			Accelion							

Figure 5: Technology lifecycle management

Appendix 3 provides more detail about the classification. The CIO will review this quarterly and the IT Governance committee twice a year. This is designed to ensure that the City proactively, rather than reactively, manages technology lifecycles and risks.

4.4 Local Innovation

The strategy and Enterprise Architecture is designed to establish shared enterprise-wide capabilities and to encourage an increased corporate focus. Nevertheless, it must be acknowledged that enterprise solutions cannot answer every business requirement (this is discussed further in Appendix 1).

This corporate approach is not designed to limit local innovation, which is to be encouraged. However, it is important that local innovation does not undermine corporate standards where they have been established. The City's IT governance processes must balance accommodating local innovation, while ensuring compliance with important standards.

4.5 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Adopt Enterprise Architecture and embed principles into technology decision making	Provides blueprint and guidelines for future decision technology decisions	Commissioner Strategic & Corporate Services	SMT, CIO, IM / IT Governance Committee	2014	No cost
Develop over-arching technology and systems lifecycle management plan	Provide clarity to the organization of the status of key technologies	CIO	ITM Management	2014	No cost
Develop individual 1, 3 and 5 year plans for all EA components	Clarity on short and medium term plans for key technologies	CIO	ITM + Steering Committees	2014 ongoing	No cost

5. SD 2: Flexible, Reliable and Forward Looking IT Infrastructure

The City's technology infrastructure underpins everything that the City does. Technology infrastructure includes email, voice, radio and data networks, servers, personal computers, printers, and other devices. It also includes data storage, backup, and disaster recovery capabilities. The City simply cannot function without its core IT services for even short periods.

As noted, more of the City's systems are connecting to the City's network than ever before. In the near future the growth of sensors and other monitoring technologies will mean that a wide range of systems; from traffic light management to real-time traffic monitoring, from parking management systems to water leak detection monitoring will rely on access to networks and computing resources. As this trend continues the reliance on the City's technology infrastructure will keep growing.

The current assessment confirms that this is an area that the City and ITM has historically managed well. It will be important to build on these good practices to ensure that the City's infrastructure continues to evolve.

5.1 Change is Constant

The IT industry moves at a rapid pace and renewal is constant. The industry itself is witnessing a couple of seismic changes that the City must be cognizant of:

Consumerization of technology: Technology is more accessible to City staff and customers in their day-to-day lives than ever before. Devices that City staff use at home may be better, newer, and more flexible than the technology the City provides. Furthermore, the tools that staff use at home to communicate and collaborate with, such as Skype, Google Docs, GoToMeeting and DropBox, may offer better functionality than the tools offered at City Hall.

New computing paradigms: For the last 20 years or more vendors have sold solutions that are installed in the City's data centre by ITM staff. Adopting the Internet approach, vendors are moving to a model where they host the software and services and customers simply access solutions via the Internet. This may eliminate some pressures in the data centre but creates new and different challenges for ITM including; policy changes, new data security requirements, integration needs and new pressures upon Internet connectivity.

5.2 Meeting City Needs

The goal is that the City's infrastructure enables City staff to be as effective as possible. Infrastructure should never create barriers to 'getting stuff done'. ITM works hard to balance the needs of staff with its ability to deliver cost effective, reliable, and secure infrastructure services.

5.3 Operations Excellence

ITM will continue its mission to enhance core IT services, with particular attention to maximizing efficiency and cost effectiveness. ITM will do this by focusing upon the following key themes:

- **Reliability:** ensuring that performance and reliability meets the needs and expectations of customers and citizens
- **Agility:** eliminating constraints and ensuring that infrastructure can be deployed rapidly and on-demand
- **Consolidation:** creating efficiencies and cost savings by reducing the number of technology solutions
- **Standardization:** creating efficiencies and cost savings through standardization
- **Virtualization:** reducing the physical number of servers, and reducing energy costs through server virtualization
- **Cloud:** exploiting alternative means of hosting and delivering services that may run outside of the City's own data centre

ITM will continue to adopt and apply industry best practices to its operations, using COBIT 5, ITIL and other industry standards as guiding frameworks. The City will continuously improve its data centre management and system operations practices.

5.4 Lifecycle Management

The City's reliance on infrastructure also increases the importance of maintaining and sustaining it so that it can meet current needs and enable future aspirations. Like any City asset, ITM builds plans to enhance, upgrade, and replace the technology infrastructure based on its lifecycle. These best practices currently apply to PCs, servers, network technologies, and other infrastructure. They are regularly revisited to ensure that they remain valid.

The City will expand this best practice to other areas, where it will develop plans to ensure that the City adopts the optimum best practice provisioning model – ensuring appropriate access to services, while balancing the need for cost effectiveness.

5.5 Flexible Technologies for Users

To ensure that the City and ITM are responsive to new trends and the needs of business units, the City will establish a representative end-user technology Working Group as part of the overall IT/IM governance framework. This group will meet at least quarterly to provide input on, and contribute to the decision making process around end-user technology.

5.6 New Technologies and Capabilities

The City also plans to implement a number of new technologies and capabilities, including:

- Data storage expansions to support 'unlimited' data storage for email, file and other data storage

- Expansion of network to support additional remote facilities
- Remote Access to support home and field based working
- Standardize on Windows 7 and Office 2010, by April 2014
- Internal messaging and collaboration capabilities
- Large file sharing capabilities

5.7 Security by Design

The City is committed to Information Security. Therefore it has appointed an IT Security Officer and developed an Information Security program. The City has undertaken a security baseline assessment and will work through the security program to address key areas. The program draws on a variety of global IT security best practices, and is based upon ISO27001. This program is designed to ensure that information security and risk management is 'baked-in' to all City technology decisions and business processes. Although focused on IT, the security program and staff will contribute to and support corporate risk management and security activities.

The governance of the security program will be integrated into the overarching IM/IT governance framework with an Information Security Steering Committee established with representatives from key areas across the City. The Information Security program will also be a significant contributor to the IT Policy and standards framework.

5.8 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Continued expansion and development of the City's internal network	To facilitate digital workflows at all City sites and to ensure readiness for increased network connections for smart devices and sensors.	CIO	Senior Manager, IT Operations	Ongoing	Budgeted
Expansion of data storage provisions and implementation of data lifecycle management policies	Ensure that file and email storage limits do not create barriers to getting work done.	CIO	Senior Manager, IT Operations	2014 - 2015	Budgeted
Review desktop lifecycle management practices, and standardize on Windows 7 and Office 2010	Standardize on operating and office versions to simplify management and collaboration.	CIO	Manager, Client Support	2014	Budgeted
Develop a revised computing devices	ITM needs to support a greater	CIO	Manager, Client	2014	TBD[2]

[2] Where costs are TBD – further, more detailed, work is required to accurately determine the costs.

Recommendation	Rationale	Owner	Support	Timing	Costs
provisioning plan	variety of devices		Support		
Develop a remote working strategy and implement supporting technologies	Facilitate remote access for all City staff that require it	CIO	ITM Management Team + End user working group	2014	TBD
Develop a corporate print strategy and implement recommendations	A review of corporate printing to ensure that print services are optimized.	CIO	Manager Client Support	2016	TBD
Develop an internal messaging, communications and collaboration strategy and implementation recommended technologies	The City must take advantage of new collaboration technologies such as video conferencing, screen sharing, and instant messaging.	CIO	ITM Management Team	2014	TBD
Develop a 'cloud readiness' checklist and guidelines	Positions the City to be able to take avenge of new and emerging solution options	CIO	ITM Management Team	2014	No cost
Establish an end-user technology working group	To ensure user perspectives appropriately considered in technology decisions.	CIO	Manager Client Support	2014	No cost
Continued development and implementation of the ISO27001 based IT security program	Embeds security best practices within City operations.	CIO	IT Security Officer	Ongoing	Budgeted

6. SD 3: Building Effective Business Systems

The business systems layer is where the City must focus its attention. As established earlier, having the right foundational, shared, business systems is a pre-requisite for the City to be effective and efficient.

6.1 Setting Clear Business Strategy

The City will leverage technology to make changes that make significant impact on efficiency, effectiveness, and customer satisfaction. However, it is important to set the right business goals first. Setting the business strategy, long before the project implementation actually begins, is what sets the stage for successful project outcomes. It is at this point that the thinking must be bold and transformative. If the scope is not set correctly, and project teams not given the right mandate to challenge existing practices – projects won't deliver the right outcomes.

Business strategies should focus upon quantifiably improved outcomes and not a simplistic 'system has been implemented' goal. Tangible targets should be set at the outset of projects, such as: reducing application processing wait times from 10 to 2 days, or reducing the number of staff processing applications, so they can be re-allocated to new legislated tasks, or targeting 50% of all requests being handled online by 2016.

The City has established the ICI team to fulfill this type of a role: reviewing functional business areas, highlighting areas in need of improvement, and identifying, at a high level, the business strategies, and supporting processes that must be implemented or redesigned to achieve improved outcomes. Therefore, the City should align the ICI program review timetable with the key business process streams that are targeted in this strategy, including: finance, HR, and land and property processes.

The City should also require that technology be built into annual and multi-year departmental business plans.

6.2 Process Re-engineering and Optimization

To reap the full rewards of implementing new technology it is critically important that process optimization be carried out before any technology solution is implemented. The City should avoid implementing new technology or new capabilities, unless time can be allocated to reviewing, re-engineering, or optimizing the business processes.

Therefore, with business strategy and goals set, the City must then focus at a more detailed level on process re-design and optimization. This means reviewing each of the tasks that make up a process – in what order are they done, who does them, how are they done and more importantly why are they done?

In many teams across the City business processes have not changed in years. Paper based processes and ledger based tracking systems that record information after the fact are in use instead of dynamic business process and case management systems that

facilitate digital processes. It is anticipated that applying process optimization techniques the City can radically improve process efficiency across the organization.

Process standardization must also be a key objective, as a driver of savings. For example, one City standardized its work management processes from hundreds of separate processes into less than a dozen standardized processes as part of its Asset Management implementation. This transferred existing, but isolated, good practices to all processes, eliminated unnecessary or duplicated tasks and simplified the technology implementation process thus reducing costs.

A process re-engineering / optimization phase will be incorporated into the City's project framework to ensure that this requirement is appropriately addressed. Business Analysts will be key in carrying out this work. The City will need to establish and fill these roles. This topic is discussed in more detail in Section 11.

6.3 Rationalized Business Systems

The Enterprise Architecture targets a business systems architecture that is built around a small number of major corporate business systems that are used to manage common business processes. These enterprise systems become platforms for managing business processes.

This approach is founded on the notion that connecting people and processes together is more valuable to the City as a whole than having the perfect solution for each business unit. Therefore, where possible the City will re-double its commitment to existing corporate applications (such as JDE, Amanda, CLASS and ESRI GIS), consolidating functions from other systems into these core systems, and decommissioning legacy systems.

The enterprise systems (platforms) are currently defined as:

- JDE
- AMANDA/DTA
- CLASS
- ESRI GIS
- Asset Management – Work Management System (TBD)
- EDRMS (TBD)
- SharePoint

6.4 Fully Utilizing Existing Enterprise Business Systems

The City will continue its commitment to JDE as its corporate ERP solution. A major renewal and augmentation of JDE for Financial and HR processes will be planned and undertaken. This will create digitized, efficient business processes for budgeting, accounting, payables, receivables, purchasing, payroll, time and attendance and many other functions that will help the City scale effectively as it grows. The City will make these critical areas a priority because of the importance throughout the organization.

The City plans to extend Amanda as its corporate Land and Property process management solution. Amanda can be used for planning, permitting, licensing, bylaw, and inspections, amongst many other things. A roadmap is in development to determine which business areas can take advantage of the Amanda solution, and to determine the implementation plan. ICI will also conduct a review in 2014 of the planning process which will provide direction on future requirements for this area.

The City will also determine its future strategy regarding CLASS. This solution provides program registration services that are used by tens of thousands of residents throughout the year. This product is being retired, and will be replaced with a hosted solution. The City will review its options and determine the strategy for this core solution.

6.5 Implement New Business Systems

Gaps in the business systems architecture that cannot be filled by existing solutions will require major new business systems to be implemented. These include:

- A corporate work management system, and other systems as identified by the Asset Management program (fixed asset module, asset lifecycle management system(s))
- Fleet Management system (which may or may not be included in the corporate asset management system)
- Facilities Management system (which may or may not be included in the corporate asset management system)
- Cashiering / Point of Sale system
- CLASS end of life strategy
- Corporate Customer Relationship Management (CRM) solution (to replace case management within JDE)
- Electronic Document and Records Management system (EDRMS)
- Possible Tax system replacement

Each of these are large and critically important business systems that will require business cases, business requirements, consulting support and significant resources to implement and sustain.

6.6 Business / ITM Partnership

The Business systems layer is so called because they are the solutions that address business unit needs. It is the business units - the departments, and teams themselves - that require and benefit from these systems. These systems improve business unit operations and efficiency, and help business units deliver better services.

Therefore, it is in Director's best interests to play a more active role in fully exploiting these systems as part of their business strategies. Directors and Managers in each business unit need to work with ITM and through the IT Governance Framework to provide leadership in determining and setting future strategic directions for the business systems that support their business processes.

6.7 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Formally recognize enterprise solutions / platforms as shared corporate resources	To establish shared ownership of corporate platforms	SMT	Commissioner Strategic & Corporate Services, CIO	2014	No cost
Establish Steering Committees for major corporate platforms / process streams	To establish the forum for shared ownership	Commissioner Strategic & Corporate Services	CIO + Business Leads	2014	No cost
Conduct reviews and set high level business strategy for key process areas, including Finance, HR, Land & Property	Set business strategy to appropriately prioritize and scope subsequent systems enhancement projects	Commissioner Strategic & Corporate Services	Commissioner Finance, ICI, CIO	2014 - 2015	No cost
Conduct fit-gap analysis and opportunities assessment for key existing business systems and develop multi-year roadmaps for major enterprise systems	Determine priorities and work plans for major enterprise systems	CIO + Steering Committees	Steering Committees	2014 - 2016	Up to 125,000 to support consulting assignments
Execute enhancement programs for existing solutions (JDE and AMANDA/DTA)[3]		CIO + Steering Committees	ITM + business units	2014 - Ongoing	TBD
Select and implement key new Corporate solutions	Projects to implement EDRMS, Work Management, Fleet, Facilities, POS and other solutions	CIO + Business Leads	ITM + business units	2014 forward	TBD
Enhance the City's project methodology to include a business		CIO	Director ICI, Senior Manager	2014	No cost to develop

[3] The City will review the development approvals process in 2014 and will determine a future strategy regarding Amanda and DTA in due course.

Recommendation	Rationale	Owner	Support	Timing	Costs
process re-engineering / optimization phase and allocate dedicated business analysis resources to key projects			Information Systems		methodology Staffing costs TBD
Pursue an application rationalization strategy in line with the Enterprise Architecture	To simplify and reduce costs associated with operating the technology environment	CIO	Steering Committees and business units	Ongoing	TBD

7. SD 4: Integration and Intelligence

Investments in the business systems layer combined with increased process digitization will propel the City from being data poor to data rich. However giving that data meaning, converting it from data to information, and generating meaningful intelligence and actionable insights from it will be key if the City is to become data driven.

7.1 Enterprise Data Management

Enterprise Data Management is a key pillar of the overall Enterprise Architecture, and central to gathering and generating *meaningful* information. The City has appointed an Enterprise Data Architect and developed an Enterprise Data Management program.

The following subject areas have been identified as the key focus areas for data standardization. This will involve the establishment of corporate data standards, data maintenance processes and authoritative, corporate datasets that can facilitate integration between systems and processes.

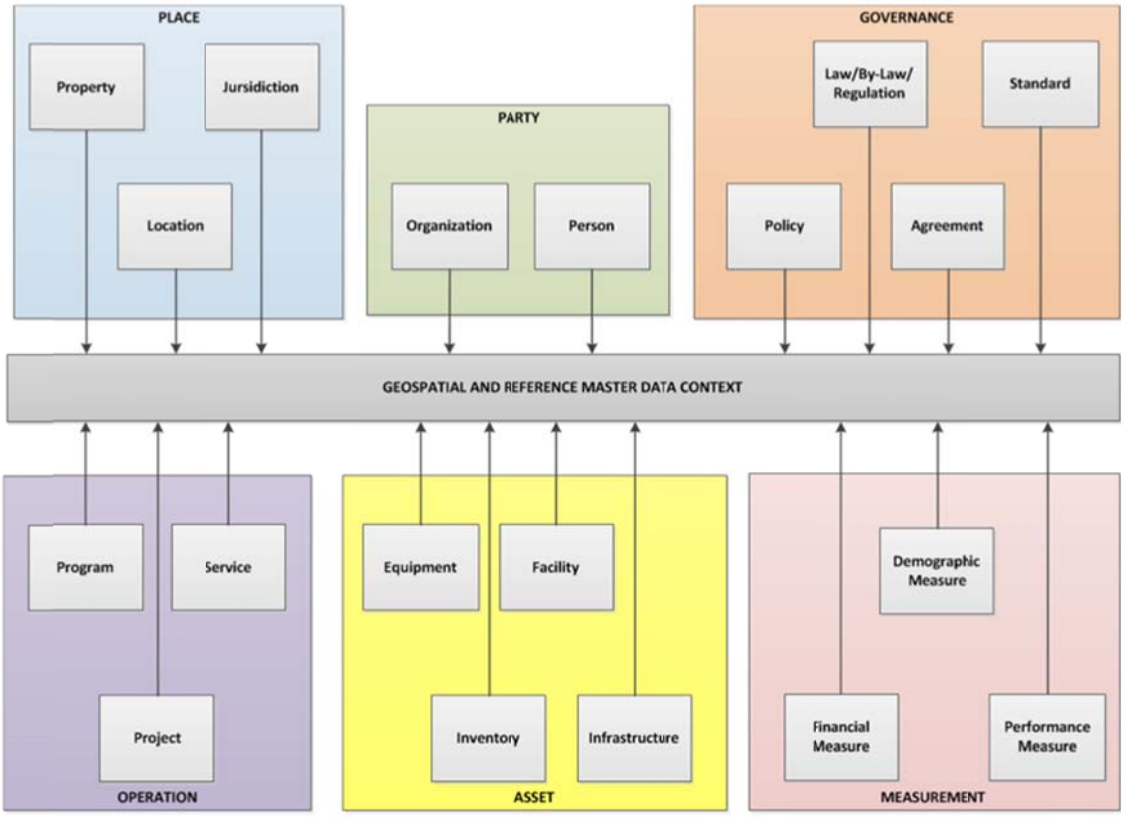


Figure 6: Enterprise data subjects

Work is underway on an employee master dataset, and standardization of property / address data is planned. These data standards will underpin major business systems projects; Party, Place and Geospatial data standards will be central to expanding the use of Amanda. Party, Assets, Operations and Geospatial will be core to implementing and

integrating Work Management systems. A revised general ledger (GL) structure will be central to a renewal of JDE and to the integration of solutions into JDE.

The work plan for the program will be aligned with other major project implementations to ensure that the right data standards are set at the right time to appropriately enable major initiatives. Data governance will be integrated into the overarching IM/IT governance framework to ensure broader alignment with other Information Management and IT activities and initiatives.

7.2 Business System Integration & Integration Hub

Interfaces are the glue that ties systems and processes together. The implementation of system integration through interfaces reduces the need for manual data entry, speeds data transfers and eliminates data entry errors. Interfaces between systems can significantly enhance and streamline business processes that rely on paper, data sharing and person-to-person notification.

With key data standards set, the City will need to establish data exchanges between systems. These integrations will occur as part of the major Enterprise Application projects (e.g. JDE renewal, Amanda expansion, Corporate Asset Management System implementation). The City should expect to implement hundreds of interfaces. In a fully integrated Finance system environment in excess of 50 data and process interfaces can be expected. Furthermore, as the City begins to use more hosted solutions, building web service based integrations will become increasingly important.

The City will therefore need to implement integration technologies to simplify the development and management of the integrations.

7.3 Conduct GIS Review and Establish New Corporate Business Model for GIS

Location is a key integrator, which will be foundational to some of the major systems that the City plans to implement (e.g. Corporate Asset Management System). The City must improve its overall GIS capabilities and capacity. Similar to other areas, a more corporate approach is required. The City will assign a corporate GIS executive champion and form a GIS Steering Committee (as one of the IT Governance Steering Committees) to lead a review of the City's use and management of GIS and develop a corporate GIS strategy.

7.4 Performance Management, Business Intelligence, Dashboards, Big Data

One of the bi-products of using real-time case and business process management tools is that the City collects a vast amount of data *about* the processes it operates. Being able to mine that information to support decision-making, and to provide insights into how the City can improve operations will be tremendously valuable – and central to becoming more efficient and effective.

By mining this data the City can identify trends and patterns, can test or confirm hypotheses, can identify preventative and mitigating measures to prevent problems before they occur and move toward predictive models that allow us to be more ready to

respond to changing conditions. Investments in Business Intelligence / Big Data, Dashboards and Performance Management capabilities will enable this.

7.5 Open Data

Cities around the world and throughout Ontario are embracing open data. Following an initial pilot, York Region has recently approved an ongoing Open Data program. The City's work on corporate data standards and improved data stewardship will position the City to be ready for Open Data, which it should anticipate dealing with in the next few years.

7.6 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Conduct a GIS review and develop a corporate GIS strategy	Establish an effective corporate GIS program	Commissioner Strategic & Corporate Services	CIO, Commissioner Planning, Commissioner Engineering + Public Works	2014	Up to 50,000 consulting costs
Continue to pursue the Enterprise Data Management program	Establish corporate data standards and processes.	CIO	Enterprise Data Architect, Steering Committee	Ongoing	No cost
Integrate Data Governance into overall IT/IM governance process	Align all technology and IM decision making	CIO	Enterprise Data Architect	2014	No cost
Establish corporate data standards and master data models for key data subjects	Simplify data sharing and improve corporate data quality	CIO	Enterprise Data Architect + business units	2014 - 2015	No cost
Implement solution(s) to support master data management	Tools to simplify implementation and ongoing management of data standards	CIO	Senior Manager, Information Systems, Enterprise Data Architect + business units	2015	TBD
Implement integration technologies	Tools to simplify implementation and operation of business systems interfaces	CIO	Senior Manager, Information Systems	2015	TBD
Identify + prioritize	Implement	CIO	Senior	2015	TBD

Recommendation	Rationale	Owner	Support	Timing	Costs
data interface requirements between key enterprise systems, and implement required interfaces	interfaces to simplify data flows and improve data accuracy		Manager, Information Systems, Enterprise Data Architect + business units	onward	
Identify requirements for, and implement performance management, Business Intelligence and data analytics tools		CIO	Senior Manager, Information Systems, Enterprise Data Architect, Senior Manager Strategic Planning, Steering committees	2014 ongoing	TBD
Implement Open Data program	Open data promotes transparency and stimulates the creation of tools that are useful to the community.	CIO	Information Management and Enterprise Data Management Steering Committees	2014 ongoing	TBD

8. SD 5: Connecting Field Staff with Technology

Although the City has implemented some one-off mobile solutions, there remain major efficiencies and improvements to be achieved by fully equipping the City's 200+ field staff with appropriate technology.

For example by equipping public works field crews with in-vehicle technology that connect them to the work management system in the office, the City can ensure that work requests are directed to the most appropriate crew. Crews can access the information they need to resolve a service request, such as maps, drawings, asset and inventory information in real-time, anywhere it is needed. This would also lead to a rationalization of clerical and admin type functions that currently handle information processing on behalf of field staff.

By connecting people through technology while the work request is being handled the customer and customer service agent can monitor the resolution of the request and managers and supervisors can approve tasks in real time.

Mobile solutions that fulfill similar tasks are required across many of the operational units including: Facilities, Enforcement, Building Inspectors, Fire Inspectors, Public Works, and Parks crews.

8.1 Leadership and Change Management

Departmental Directors must anticipate that implementing mobile technologies will mean major changes to existing working practices and new expectations from staff, such as data entry and computer literacy. This may require changes to job functions and roles and responsibilities.

Experience shows that resistance from staff frequently undermines the success of these types of projects. While getting the technology to work well is important, success in this area is also dependent upon departmental leadership and commitment to change. This commitment must be accompanied by a change management program that includes consistent ongoing communication with, and training and support for, staff that have not traditionally been exposed to computers at work. Monitoring of the adoption of new systems must be put in place and this should be backed up with consequences for those staff that are non-compliant.

8.2 Setting the Business Systems Foundations

It is critical to first implement the back-end business systems before implementing ad-hoc mobile solutions. Extending the business systems that are already in use in the office (e.g. Amanda, Asset Management) into the field is what connects staff together, and what will ensure that business processes can be electronically managed from beginning to end in an integrated way. Implementing mobile technology *before* establishing the business system foundations often leads to poor outcomes – resulting in expensive technologies not being used, and goals not being met.

8.3 Setting the Technology Strategy

Improvements in hardware and devices along with improved options for mobile connectivity are opening up new opportunities. Each of the business systems vendors offer their own mobile solutions, but the mobile world is moving so fast that it is hard for vendors and municipalities to keep up. There is an almost bewildering set of options.

Requirements vary across each of the business units as their use patterns differ. The business systems involved may be different. Many factors will affect the specificity of the solution, such as whether a user needs a laptop, handheld, smartphone, or tablet. Use types for in-vehicle, portable computing, or mobile printing, and connectivity requirements such as always on, hot-spot synchronization or manual synchronization will also differ by user group. These specific needs must be catered to in order to achieve the highest level of efficiency and effectiveness.

This is why it is critical to develop a clear, consistent, and manageable strategy for mobilizing staff. Without a clear strategy, the City may implement solutions that do not meet needs and are costly to operate and support.

The mobile working group will lead a broad review of all of the needs across the departments to identify where common needs can be tackled together, and where differences must be accommodated.

8.4 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Establish a corporate mobile working group	Review current mobile solutions, develop lessons learned and identify future needs	CIO	Mobile worker business units + Senior Manager IS, Senior Manager IT operations, Manager Client support	2014	No cost
Develop a corporate mobile strategy	Set strategy for mobile workers to simplify options and contain deployment costs	CIO	Steering Committee	2015	TBD
Deploy mobile solutions connected to back office systems including Amanda and CAMS, for Building, Fire, Bylaw, Water, Roads and other Public Works units	Extend technology solutions to the field	CIO + Directors	Business units + ITM team	2014 (Amanda) Other solutions 2015 - ongoing	TBD

9. SD 6: Delivering Digital Services Anytime, Anywhere

Customer expectations of government services have changed. The vast majority of people in Vaughan (at least 81%) are online and that is where the City's services must be. All levels of government are aggressively pushing services online and reaping a wide range of benefits including:

- Improved customer convenience, service and satisfaction levels
  - Anywhere, anytime services
  - Self service
  - Quicker service turnaround
- Internal cost reductions through efficiencies
  - Process streamlining
  - Reduced internal data input requirements
  - Fewer errors
  - Reduction in paper use
  - Reduction in front counter staff required to administer processes
- Environmental benefits (e.g. reduced vehicular trips to town hall)
- Increased transparency

9.1 New Digital Services

The City will focus upon re-imagining, redesigning and delivering new services that allow customers to carry out transactions with the City where, when and how they wish.

This includes enabling the following types of service:

- Applying for and tracking applications for City services (permits, licenses, approvals, parking considerations)
- Searching FAQs, registers, key databases and other data sources
- Submitting information to the City via electronic forms
- Submitting and tracking inquiries or service requests to the City via their smartphone or from the web
- Making online payments for City services
- Buying physical and digital City products and services
- Booking City services such as recreation programs, facilities, events and inspections
- Subscribing to notifications about the City, what is happening locally, service performance and disruptions
- Accessing hyper-local information about City services and bylaws (e.g. zoning) that apply to a location

9.2 Web and e-Government Leadership

As part of a broader e-Government strategy, developed by IBM, the City implemented a new internal portal (2010) and City website (2012) – this has established a powerful platform for digital services.

While the City made the decision to distribute the authorship of the website, the management and leadership responsibilities for developing the web as a customer service channel are not clearly defined.

The proposed Web Steering Committee discussed in Section 11 will, at a minimum, establish a forum in which the City can better coordinate web activities and initiatives.

The web and e-Government strategy, which will require a refresh, will require leadership to carry it forward. To do this it is recommended that the City appoint a Corporate Web & e-Government Program Leader to head the program. Given the importance of integrating online services to back-office, business systems, the City will first establish the business system foundations before significantly pursuing the e-Government services. Therefore, the Digital Service strategic direction should be treated as a medium term (three year) goal.

9.3 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Establish a corporate Web Steering Committee (part of IT/IM governance framework).	Web is key corporate platform that requires shared ownership and ongoing coordination	CIO and Communications Director	Business unit representatives	2014	No cost
Establish a new corporate content management role within communications	Lead corporate content authoring and to support improved corporate content	Communications Director	All departments	2014	TBD
Create leadership position to run the implementation of the e-Government strategy	Leadership is required for the e-Government program.	Commissioner Strategic & Corporate Services	CIO, IM/IT Governance Committee	2016	TBD
Review and revise the e-Government strategy in line with the EA and IT Strategy + develop recommended implementation plan	Existing e-Government strategy is 5 years old and must be renewed	e-Government Leader	CIO, IM/IT Governance Committee + business units	2016	TBD

10. Implementing the Plan

10.1 A New Approach to Technology

The strategic themes point to a realigning of the City's approach to technology which;

- Establishes technology as a core part of the City's business strategy,
- Makes technology central to how the City runs, underpinning its effectiveness
- Combines technology with business process redesign to lead major service transformation

Undoubtedly this major corporate and cultural change will take some time to fully infuse the organization. The City will need to establish processes and methodologies to help the changes become the new mode of operation.

10.2 Strategic Directions Require a New Decision Making Model

A new governance model for technology decision-making is the key change recommended.

Moving away from a department-centric to a corporate centric model requires a change in the way that decisions are made. The City will face difficult technology choices moving forward that will require compromise from department heads and will require commitment to the Enterprise Architecture at the most senior level. The City's Executive must provide leadership on key areas – setting the stage for successful outcomes, and ensure that business and technology resources are directed to the right priorities.

10.3 Combined Information Management Governance Framework

To coordinate complementary activities and initiatives the City will combine its governance of Information Technology and Information Management into a single IM and IT governance framework. The framework is designed to ensure that the right people are involved in the decision making process at the appropriate time. Organizing decision-making in a more formalized, structured way ensures that the City can keep its commitment to the Enterprise Architecture. The governance framework engages all levels in the organization, including executive, departmental and IT management and grassroots staff in a partnership, transparent approach to technology decision-making. Engaging more senior staff in the governance of IT positions the City to be better able to tackle, rather than shy away from, the big decisions that must be taken.

Figure 7 below illustrates the IM/IT governance framework

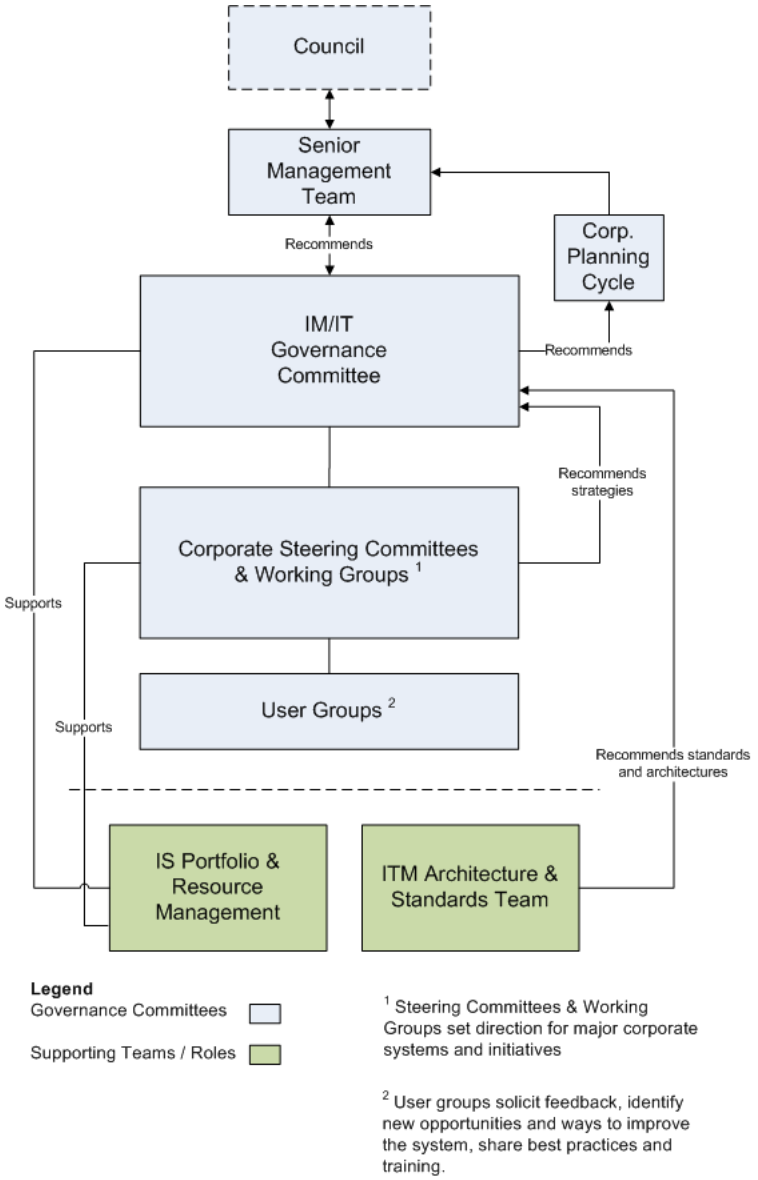


Figure 7: IT governance model

10.4 Governance Bodies – Roles and Responsibilities

The IM IT Governance Framework is comprised of the following groups/committees and individuals:

- **SMT:** SMT will provide strategic direction, oversight on the IT portfolio and be consulted on key IT decisions on a regular basis.
- **IM/IT Governance Committee**: select representatives from key areas of the organization, chaired by the Commissioner of Strategic and Corporate Services, with the CIO acting as vice chair. This group is charged with IT decision making regarding strategic directions, IT investments, IT policy, and approval of corporate IT architectures and standards. The group will meet monthly.

- **Steering Committees and Working Groups**: these groups are convened around enterprise processes and other major programs or initiatives. They are responsible for developing strategies, work plans and prioritizing projects and initiatives within program areas to ensure that projects and initiatives are complementary and aligned. Strategies developed by these working groups are to be reviewed and approved by the IM/IT Governance Committee (and if appropriate SMT). Given the strategic directions set, the City will establish the following groups:
    - Land & Property, Asset Management, Finance & HR, GIS, Information & Data Management, Information Security, Web & e-Services, Mobile Working and End User Technology[4]
- **User Groups:** given that the steering committees are intended to focus on the strategic direction for major systems and not on day-to-day operational issues, in some cases it may be beneficial to operate a user group. A user group would involve interested 'users' and 'power-users' of systems that would be convened, perhaps quarterly, to discuss issues, identify improvements, flag upcoming changes and share information about how the system is used in different business units.

10.5 Supporting Roles

The following groups support the activities of the IT Governance Framework:

- **CIO**: responsible for leading the development of technology strategy and policies, overseeing the operation of the IT governance framework, and acting as leader and advisor to the IM/IT Governance group. The CIO has management responsibility for the governance supporting functions (including IS Portfolio & Resource Management and ITM Technical Architecture & Standards Team) and facilitates IT decision making by providing insight and transparency to the IT Governance Committee into the overall IT environment, processes and resource utilization.
- **IS Portfolio & Resource Management**: the Senior Manager, Information Systems and team, carries out the PMO function. This supports the IT Governance Framework by evaluating projects, monitoring and reporting upon IT capacity and resource utilization, reporting on the overall IT portfolio, and operating checkpoints for the project management process to ensure compliance with project management standards.
- **ITM Architecture and Standards Team**: is a virtual team of IT staff responsible for developing, recommending and monitoring compliance with technical and architectural standards to the IT Governance Committee. This includes the development of lifecycle/roadmaps to ensure that sustainability can be achieved for the City's IT environment.

[4] Note that not all of these groups must be established immediately – the groups will be established as they are required.

10.6 Integration with Corporate Processes

The IT Governance Framework interfaces with a number of existing City groups:

- **The Corporate Planning Cycle**: the IT Governance Committee will review **all** technology-related budget submissions, and will prioritize and recommend the IT additional resource requests (ARRs), before submitting to the **Corporate Planning Cycle**.
- **Directors Group**: The CIO is responsible for providing the link to the Directors group and keeping Directors informed of technology plans and initiatives in conjunction with messages from SMT.

10.7 Supporting Governance Processes and Activities

In addition to the Governance groups a number of other mechanisms will be implemented to align IM/IT activities and ensure that ITM is responsive to corporate needs.

10.7.1 Balancing Supply and Demand – Selecting the Right Projects

Realistically there are more opportunities for the City to implement technology than it can handle. So many, in fact that some great opportunities will simply have to be passed up. Council, management and staff must accept that it does not have sufficient resources to pursue all of the opportunities that are presented. Consequently, it is important to decide which projects the City *does* and *does not* apply resources to. Making these decisions and sticking to them will be critical.

Decisions regarding technology project selection will be consolidated under the responsibility of the IT Governance Committee. The IT Governance Committee will be responsible for preparing a consolidated Annual capital budget for technology investments. In-year projects initiated outside of the budget process will also be reviewed and approved by the IT Governance Committee. [5]

The City will develop a more robust justification process for technology projects to ensure that it works on the projects that deliver the best return on investment. The City will review and revise the current project prioritization process to ensure that it is fully aligned with the Enterprise Architecture principles, this strategy, and other City strategies. The CIO will work with the Commissioner of Finance to ensure that the IM/IT process aligns with the corporate budget process.

10.7.2 Corporate IT Policy

To underpin the changes recommended in the strategy and to ingrain the new approach to technology into the culture of the organization will require formal policies and standards (e.g. to formalize security or data standards or document the project justification process).

[5] Note that ITM leadership retains the responsibility for IT Management and the management of the ITM operating budget.

Rather than developing standalone IT policies the City will develop a new over-arching IT Policy Framework that will support policies, standards and standard operating procedures. The IT policy framework will create the necessary mechanisms to enact and enforce new policies and standards in a consistent, repeatable way.

10.7.3 Financial Reporting and Planning

The City needs to develop a stronger understanding of where it spends money on technology (regardless of budget source) and allocates its resources. To do this the City will begin to monitor and report on its IT financials in a more detailed way and from different perspectives.

One new way will be adopting a portfolio management approach (see Appendix 3 for more details). The City will define a set of IT investment categories (e.g. run the business, grow the business, transform the business) and establish targets for the City's expenditures in each category. By tracking time and expenditure against these categories the City will better understand the profile of its expenditures. Over time the City will work to change this profile; reducing spend in core and non-discretionary categories that are required to run the business, freeing up resources and dollars to allocate to efforts that can grow and transform the business.

10.7.4 Performance Management

Just as the broader strategy points toward the City becoming more data driven, so will the business of technology management. The City will develop a new set of business-focused metrics to help SMT, IT Governance and ITM management groups better understand and monitor the City's performance in executing this strategy and the day-to-day operations. Topic areas for new metrics include:

- Ideas portfolio (new, transitioning to project)
- Project portfolio (new, in progress, milestones, portfolio status, actions)
- Service Requests (volumes, targets)
- Change Requests (volumes, targets)
- Enterprise Architecture compliance (exceptions)
- Assets (status, investment by category, resource use by asset)
- Resource (availability, utilization, allocation, resource use by portfolio category)
- Financials (cash flow, budget vs. actual, spend by portfolio category, spend by asset)

10.7.5 Reporting to Council

It is important that Council better understands how technology and information management underpin the effectiveness of the organization. To do this the conversation with Council must be changed. Council must be kept informed about the overall roadmap, and helped to understand how the initiatives that are being undertaken support improved outcomes for customers and for departments.

The IM/IT Governance Committee will provide updates to Council – that focus upon the enablement of new business capabilities through technology. The report should

highlight cost savings and avoidances, new capabilities, capacities, and new service offerings that have been enabled by technology.

10.8 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
Implement the recommended corporate IM / IT Governance model	Establish shared ownership and aligned decision making for IM and technology	Commissioner Strategic & Corporate Services	CIO, Senior Manager Information Systems + Steering Committee chairs	2014	No cost
Establish new technology project justification and prioritization methods	Ensure that high value projects are selected and prioritized	Commissioner Strategic & Corporate Services IM/IT Governance Committee	CIO + Senior Manager Information Systems + Commissioner Finance	2014	No cost
Establish corporate IM/IT portfolio management and resource management methodologies, processes and tools	Tools that allow for effective management of projects, IT assets and IT resources	CIO	Senior Manager Information Systems	2014	No cost
Develop improved financial portfolio management capabilities	Deeper insight into City's technology spend and performance	CIO	Senior Manager Information Systems	2015	No cost
Develop and approve corporate IT policy framework, and supporting policies, standards and operating procedures	Codify standards and best practices into corporate policy	CIO	IT/IM Governance Committee, ITM staff and Steering Committees	2014 - ongoing	No cost
Establish and refine business focused, strategically aligned IM/IT performance measures and reporting framework	Monitor performance and effectiveness	CIO	IT/IM Governance Committee, ITM staff	2014 - ongoing	No cost
Institute formal IM/IT reporting to Council from IM / IT Governance Committee	Communicate value and importance of technology	Commissioner Strategic & Corporate Services	CIO + IM/IT Governance Committee	2014 – ongoing	No cost

11. A New Partnership between ITM and Business Areas

Developing stronger partnership between business areas and ITM will be critical to the City's ability to approach technology in a new way, and to successfully deliver this strategy.

The City's leadership and ITM have recognized this and have been working to reorient ITM's service delivery model over the last 18 months. This has included establishing an IT governance model, reorganizing the ITM team, and assigning staff within ITM to work more closely with business leaders.

Figure 8 illustrates the transition that is underway – moving from an IT organization that keeps the lights on, to a trusted supplier, to a proactive business partner.

ITM will continue to execute this transition – with the support of SMT.

The strengthening of the governance arrangements through the IM/IT Governance Framework recommended in Chapter 10 is one mechanism that is designed to foster stronger partnership and joint working between business units and ITM.

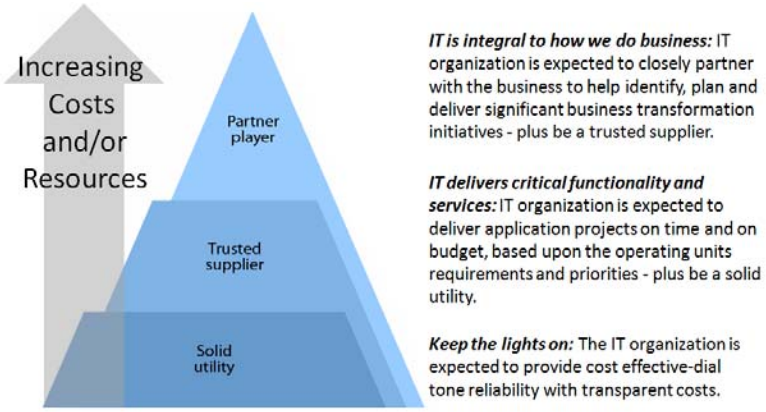


Figure 8: IT organization type pyramid

Other techniques, tactics, and strategies will also be required to shift the role of ITM into being a *partner player*.

11.1 Transforming the ITM Team

To support this transition, a re-organization of teams, roles, and responsibilities within ITM, designed to place a stronger emphasis on enterprise business systems, has already been implemented.

Section 11.4 below recommends the addition of new personnel specifically to focus upon Enterprise Business Systems. Once the ITM team is stabilized, the ITM leadership team will conduct a competency assessment to determine the match with skills and resources that will be required to support the delivery of the strategy and will prioritize new resources accordingly.

11.2 Stronger Leadership from ITM

ITM will continue their transition; becoming more connected to the departments and providing stronger leadership around the Enterprise Architecture and Enterprise Business Systems.

The CIO will continue to build strong relationships with Directors and Commissioners, regularly meeting to communicate plans and directions, discussing business strategies, goals, and the ways in which technology can support those goals.

11.3 Stronger Business Leadership

Directors and Managers in each department are critical to the success of this strategy. Each must become more engaged in setting the strategy, the direction, and the roadmap for the key business systems that they need to operate their businesses more effectively. Directors and managers must understand the importance of the broader vision and be willing to operate within the Enterprise framework established by this strategy. They need to work together with ITM and other business leaders to reach compromises and consensus upon strategic directions. The IT governance framework, and the steering committees will be the forum in which to set strategy, direct effort and make decisions regarding key systems.

11.4 New Resource Needs in ITM

Despite the recent reorganization in ITM, the City still requires additional IT staff, particularly in the enterprise business systems area. This area has been historically under-resourced, which is one reason the City has under-utilized its core business systems.

Supporting and growing the existing enterprise business systems, and implementing major new systems is central to this strategy. This cannot be achieved without resources.

Comparable municipalities to Vaughan that effectively leverage their large enterprise business systems dedicate a number of IT resources to support and grow each of these systems. Examples include the Town of Oakville who have a JDE team of four staff, or the City of Kitchener that has a Work Management System support team of three and an Amanda team of two and half.

Each of the City's enterprise business systems areas will require new teams temporarily to implement, and permanently to grow and sustain. The City must establish strong leadership for each of the enterprise business systems. For enterprise systems, this leadership will partly come from ITM. Therefore, it will be important that ITM has staff that can fulfill the role of 'corporate system leader' for each of the enterprise systems. A desirable model is to have between two to three staff – a systems leader and two analysts – to support each of the enterprise business systems/platforms.

The ITM leadership team will determine the specific resourcing needs and priorities in due course based upon the competency assessment. However, the City should consider the following resource needs as a guide to the future order of magnitude of resource requirements for major enterprise business systems.

System	Current Technology Resources	Recommended Technology Resources	Differential
Amanda / DTA	1	3	2
JDE	1	3	2
Asset Management	0	3	3
CLASS	1	1	0
GIS	2	3	1
EDRMS	0	2	2
Total	**4**	**15**	**11**

Figure 9: Potential enterprise business systems resource requirements

In addition to these resources, the City will also need to consider its need for the following staff to support key strategic initiatives that have already begun, or that are recommended by the strategy:

- Data Analyst (Enterprise Data Program)
- Security Analyst (Security Program)
- Corporate Web & e-Government Program Leader

Finally, the City should anticipate that the development of a corporate GIS strategy will lead to the creation of new positions. At a minimum, the City should plan to add a Corporate GIS Leader.

The timing and relative priority of each of these additional positions will need to be determined in alignment with implementation timelines, and phased to fit with broader corporate priorities.

11.5 Business Analysts

The importance of business process re-engineering and optimization has been stressed throughout the strategy. The business analyst (BA) role is critical in helping business units step back from their day-to-day operations to look critically at the way they do their business. Using business process mapping and analysis, and applying process optimization techniques (e.g. lean six sigma), the BA will work with departments to significantly improve business processes.

The City does not currently employ any BAs although the City does use consultants on some large projects to fulfill, at a high level, some of what a BA would do. For smaller projects, ITM staff have filled this gap with varying results. The City desperately needs BAs to tackle the business process redesign and optimization that this strategy recommends.

Best practices would suggest that BAs should be established in each department. However, because it is not financially practical for the City to fund a BA in each department, it is recommended that the City establish a pool of BAs, up to four BAs may

be required, that can be allocated to key projects. These roles may initially be contract positions that are capitally funded, and linked directly to capital projects e.g. Asset Management, GIS or Amanda implementation projects. Over time, it is anticipated that the value that these roles provide to the City will be demonstrated and the City may look to make some BA positions permanent.

The BA work complements the ICI initiatives. ICI is focused at a higher level upon business strategy and improvement areas. The BA focuses at a detailed level on supporting the implementation of business process and technology changes that ICI identifies. Because of this linkage it is suggested that, initially at least, the BA pool be aligned with the ICI group. Over time as the BA practice matures and the City better understands the role of the BA, it may be desirable, indeed preferable, to push out BA skills and roles into departments.

11.6 An Extended IT Business Model

In some areas given the extensive amount of technology and importance of that technology there may be a requirement for dedicated technical resources to be embedded within the department.

Wherever this is done, the role should be an ITM staff member that is allocated to a department – not a role hired by a department. One area where this may be considered is in the Fire department; where a dedicated IT analyst would be invaluable in advancing the disparate technologies in use.

11.7 Resource Needs Summary

There are opportunities and needs for increased resourcing throughout the organization. Realistically the City cannot expect to implement and operate major new business systems such as CAMS or EDRMS, or enhance existing systems such as JD Edwards with its current staffing levels. The table below provides a clear indication of the number and areas of resource need.

Area	**Additional Resources**
Business Systems	Up to 11 new business systems staff
Enterprise Program Analysts	Up to 2 new staff (Data Analyst + Security Analyst)
Corporate leadership roles	2 new roles (Corporate Web Leader + Corporate GIS Leader)
Business Analysts	Up to 4 new BA staff
Departmental IT staff	At least 1 position in Fire
Total	**Up to 20 new positions**

To be clear this strategy does not recommend the immediate addition of 20 staff. The City must consider carefully these demands in context: which resource areas must be prioritized, what funding approaches can be used, are positions contract or permanent, alongside a variety of other corporate and project specific factors.

11.8 Partnerships with Other Agencies

Increasingly pressure to reduce costs and cut red tape is contributing to shared IT solutions becoming a more common feature of joined-up and effective government.

The City already enjoys a number of fruitful partnerships with the Region of York including the York Info Partners arrangement. These relationships may be a useful starting point for additional future collaboration. For instance, York Region has a strong GIS function that the City may be able to leverage to further its own GIS capabilities.

Beyond York Region many of the lower tier municipalities in York Region, and in the broader GTA, are also dealing with similar challenges to those faced by the City. Sharing experiences and technologies may help the City tackle these challenges more cost effectively.

As the City pursues the opportunities identified in this strategy, it will evaluate the potential for partnership, sharing services or joint procurement as a means of reducing the net costs to the City and its taxpayers.

11.9 Recommendations

Recommendation	Rationale	Owner	Support	Timing	Costs
ITM to continue its transition to a partner player	Successful technology relies upon strong business-IT partnership	CIO	ITM Team	Ongoing	No cost
Conduct ITM competency review and staff gap analysis to determine immediate future, and medium term needs	Assess current skills and skill gaps and future resource needs to meet	CIO	ITM leadership team + HR	2014	TBD
Develop an ITM resource management roadmap, to identify prioritized position needs and seek approval through ARR process	Additional ITM resources are required to support IT strategic goals.	CIO	ITM management team + IT Governance Committee Commissioner S + CS	2014	No cost
Creation of new Business Analyst positions	BA roles are required to conduct detailed business process design	Commissioner Strategic & Corporate Services	Director ICI + CIO		TBD
ICI to develop a Business Analysis best practices framework	Establish best practices approach to business analysis and business process design	Director ICI	CIO, Senior Manager Information Systems		TBD
Explore partnership opportunities that arise within the Region and with other potential partners	Achieve cost reductions or service improvements through partnership	CIO		2014 – ongoing	No cost
ARR priority setting criteria revised to reflect corporate value of investment in IT staff	Ensure IT resources can be prioritized	Dir. Budgeting and Finance	DWG	2014 – ongoing	No cost

12. Implementation Plan

The strategy and implementation plan have been deliberately separated. It is important first to set the strategic directions and secure agreement that the strategy is the right one before implementation plans are developed. Note that for each of the major initiatives, before budgets can be set, more work is required to fully evaluate the requirements, set project scope, develop the business case, and understand staff and funding needs. Therefore, once corporate support has been secured for the overall strategy the individual components of the strategy will be brought forward through the IT Governance Framework into the corporate budget process.

12.1 Immediate Actions

The following section identifies the recommendations that should be targeted for immediate implementation in the next 6 – 12 months:

	2014											
	J	F	M	A	M	J	J	A	S	O	N	D
IT GOVERNANCE												
Implement corporate IM / IT Governance model												
Establish new technology project justification methods												
Establish corporate IM/IT portfolio management, prioritization and resource management methodologies, processes and tools that integrate with corporate budget processes												
Conduct a reset / review of the existing IT project portfolio to confirm whether current requests can be rationalized or eliminated												
Develop and approve corporate IT policy framework, and supporting policies, standards and operating procedures												
Establish new IM/IT performance measures and reporting framework												
Develop financial portfolio management & reporting capabilities												
Institute semi-annual IM/IT reporting to Council												
INFRASTRUCTURE												
Data storage expansion & data lifecycle management policies												
Review of desktop lifecycle management practices, and standardization on Windows 7 and Office 2010												
Roll out of large file transfer capabilities												
Implementation of technologies to support remote access												
Establish end-user technology working group												

	2014											
	J	F	M	A	M	J	J	A	S	O	N	D
IT GOVERNANCE												
Conduct review of end user device provision practices												
Ongoing development and integration of the IT security program												
Begin program to develop 1, 3 and 5 year plans for key infrastructure												
Communications and messaging strategy												
Cloud readiness guidelines and City position statement												
BUSINESS SYSTEMS												
Establishment of formal Steering Committees												
Conduct reviews and set key business strategies for key corporate services; Finance, HR and Procurement												
Conduct JDE opportunities review, develop business case and roadmap, implementation, budget and resource plans												
Finalize AMANDA/DTA roadmap, implementation plan, budget and resource plans												
Amanda upgrades and enhancements												
WMS planning and selection												
Determine corporate direction with regard to EDRMS												
DATA & INTEGRATION												
Establish corporate data standards and MDM models for key data subjects: employee, party, property												
Implement MDM solutions for employee and property												
Identify systems integration requirements for Amanda and ERP – determine preferred integration directions												
Select and implement performance management system												
Develop Corporate GIS strategy												
ITM TEAM												
Complete ITM reorganizations												
Develop new internal management metrics and stretch targets												
Conduct ITM competency review and staff gap analysis to determine immediate future, and medium term needs												
Develop an ITM resource management roadmap, identify prioritized roles												

	2014											
	J	F	M	A	M	J	J	A	S	O	N	D
IT GOVERNANCE												
2014 ARR submission for phased introduction of new ITM positions												
2014 ARR submission for phased introduction of new Business Analyst positions												
Explore partnership opportunities with the Region and other potential partners												

12.2 High Level Roadmap

Figure 10 (over the page) presents the anticipated major activities over the course of the strategy. As noted, this work plan will be subject to change based upon direction provided by the IM / IT Governance Committee and funding availability.

	2014	2015	2016	2017	2018
Governance	• Establish new IT/IM governance groups • Establish key steering committees + integration of existing project teams, committees and U.G's • Semi annual council reporting	• Establish remaining steering committees • Sustain and enhance governance activities + • Business benefits tracking • Council reporting	• Sustain and enhance governance activities + • Benefits realization program	• Sustain + enhance governance activities	• Sustain + enhance governance activities
Methods + practices	• New project justification process • Project prioritization and selection process • IT project portfolio reporting • IT management metrics • Performance measures • Technology management plans • Ongoing security practice integration	• IT policy framework • Improvements to existing methods + • IT investment framework • Business Analysis framework • IT policies, standards and processes • Refine performance measures	• Improvements to existing methods + • IT investment portfolio shaping • BA framework refinement	• Improvements to existing methods	• Improvements to existing methods
Strategies + plans	• Lifecycle plans + • GIS strategy • JDE opportunities review + business case • Communications + messaging strategy • Data lifecycle management plan • Device provisioning plan	• Lifecycle plans + • Integration strategy • CLASS EoL planning • Remote working + mobile strategy	• Lifecycle plans + • eGov strategy refresh • Customer service strategy + CRM review	• Lifecycle plans +	• Lifecycle plans +

	2014	2015	2016	2017	2018
Business systems	• Performance management • Asset Management (CWMS + AMS) • AMANDA (inspections) upgrade + enhancements	• JDE Finance enhancements • Asset Management (CWMS + AMS) • GIS platform • AMANDA/DTA expansion • MDM + Integration tools • Mobile deployments	• JDE Finance enhancements • Asset Management (CWMS + AMS) • POS • JDE HR enhancements • CLASS replacement • GIS integration • Amanda expansion • Online services • Mobile deployments	• JDE HR • EDRMS • Tax • Online services • Mobile deployments	• EDRMS • CRM • Online services
Other	• Finance + procurement business strategy • Property data standards • Planning review	• HR business strategy • People data standard • GIS data standards + enrichment			
ITM Resources	• Complete ITM reorg • Conduct skills + complement analysis • Develop ITM resource plan • Amanda x 1 • Data Analyst x 1	• GIS leader • CAMS x 1 • Amanda x 1 • JDE x 1 • Security Analyst x 1	• JDE x 1 • CAMS x 1 • GIS x 1	• CAMS x 1 • GIS x 1	• EDRMS x 2 • GIS x 1
Other Resource	• Communications Specialist – Website Content Management x 1	• BA x 2 • Fire IT Analyst x 1	• eGov leader • BA x 1	• BA x 1	

Figure 10: High level roadmap

13. Summary of Future Directions

Throughout this document, a large number of recommended actions are identified. This is intended to give clear guidance to those responsible for implementing the plan.

At its core, the strategy recommends a new corporate approach that places technology at the heart of the City's business strategy. Furthermore, technology must become a key enabler in building an effective, efficient, smart City that is well positioned for the future. To achieve this the City must:

1. Adopt a planned, collaborative and corporate approach to technology
2. Strengthen corporate IT governance through a combined corporate Information Technology and Information Management governance model
3. Adopt the Enterprise Architecture (EA) and implement mechanisms to embed the Enterprise Architecture principles within the City's decision making processes
4. Enhance existing IT governance processes to establish a robust technology project justification process, and develop mechanisms to enable effective management of the technology portfolio including project prioritization, financial planning and resource management
5. Ensure technology is embedded within each department's business strategy by requiring all departmental business plans to address technology needs
6. Use ICI to facilitate the setting of business strategies in corporate wide business process areas (e.g. HR, Finance, Procurement)
7. Ensure that systems thinking and process redesign occurs before technology implementation by redesigning project methodologies, developing a business analysis framework and establishing new roles for business analysts
8. Review each of the major enterprise business systems to identify opportunities to fully leverage these systems and develop multi-year roadmaps to address major opportunities
9. Execute projects to enhance existing enterprise business systems including JD Edwards, Planning/Building/Licensing solution, ESRI GIS to fully leverage process digitization and automation
10. Implement major new business systems to address future business needs, including major systems for asset and work management, fleet and facilities management, cashiering, EDRMS
11. Develop a GIS strategy to establish the future direction for a strong corporate GIS service
12. Review and renew the City's e-Government strategy and implement a range of new online services
13. Ensure additional resource funding for all new technology projects and initiatives are included as part of the project funding request
14. Increase the City's IT complement, with a focus upon providing leadership, support, and growth for major corporate business systems through established corporate business and financial planning framework.

Appendix 1 – Enterprise Architecture

Understanding the Architecture

There are four layers. The layers are interconnected. That is each entity within a layer relies upon the other layers for City staff to deliver City services to internal and external clients.

1. **Infrastructure:** The core underlying technology infrastructure or computing environment (such as networks, servers, PCs, database, data storage, telephony and security) that provides staff with access to critical computing resources, the Internet, communications tools and business systems. The technology infrastructure provides the necessary technology to staff and the public in a reliable and secure manner that is backed up and ready to support business continuity in the event of an emergency. The infrastructure that the City provides reflects the needs of the users, is nimble and responsive to new technologies (e.g. tablets, smartphones, file sharing) and changing business norms (e.g. video conferencing, screen sharing) and enables rather than blocks staff from being effective in their jobs.
2. **Business Systems:** The business systems (such as JD Edwards, AMANDA/DTA, CLASS, GIS) that are used to run the department's day-to-day business operations (e.g. track applications, dispatch fire trucks, issue building permits, book recreation classes and take customer payments). The goal here is to minimize the number of major business systems that the City operates. A small number of shared corporate wide business systems are needed to tackle common themes and business processes (land and property, assets, financial, human resources and spatial), digitally connecting cross-departmental business processes together. In addition, many point solutions that enable specific areas of the business Fire dispatch for example, are operating with a clear support model in place. All of the business systems rely upon the underlying infrastructure to allow them to operate (e.g. databases, servers, network and a PC). Without reliable infrastructure, business systems will not be effective.
3. **Integration:** These are the tools, technologies and data standards that allow information from separate business systems to be connected and combined. This integration minimizes work for staff, by reducing the amount of duplicate data entry, it also allows staff to easily find required information and enables management to gather insights, identify trends and patterns that help them manage their services more cost effectively. Setting and enforcing common data standards across systems is central to enabling the City to build a common view of the interactions it has with customers or with properties across departments. GIS ties all of the work that City does, and interactions that it has with a location – enabling power analysis and spatial trend identification.
4. **Customer Facing Systems/Customer Access Channels:** These are the services that the City's customers interact with directly, such as the website, telephone and face-to-face services. The web provides information for customers to self-serve, but

should be seen as more than that - a customer service platform. Using the web (and apps) customers should be able to interact directly with the City using web technologies – submitting and tracking service requests and enquiries, applying and paying for services, booking City facilities and other routine and complex services. Web apps, and smart phone apps interact with business systems to pass requests and applications into the systems that back office and field staff use to process them. In some cases back office solutions may have public facing components which can be integrated into the City's website. In other cases solutions must be built that use the integration layer to pass customer requests through the CRM and into the back office systems. This allows the CRM to keep a consistent record of the interactions that individuals have with the City, regardless of the City department they are interacting with.

All of the layers are interconnected. Without a stable, secure, infrastructure layer, reliable business applications cannot support efficient and effective service delivery, without these back-end applications delivering integrated end-to-end online services cannot be achieved, and without the integration layer information remains locked within the individual application silos.

The architecture must be implemented from the bottom up – there is no other way of doing it that has proved successful.

Augmenting Enterprise Business Systems

The focus of the Enterprise Architecture is on enterprise business systems. However it is important to note that in any municipality, there are many separate systems in operation for perfectly reasonable reasons; they address a niche or specialist need, or the department's needs are not fulfilled by enterprise business systems.

In many cases, enterprise business systems do not fulfill a function, or have not been built to cater to specific needs. It is accepted that enterprise business systems will need to be augmented with other subsidiary systems. Nevertheless, the City must be cautious in implementing add-ons and sub-systems. It must evaluate fully whether the existing systems can achieve an 80% solution, it must ensure that sub-systems do not undermine data standards and other EA principles; it must fully evaluate the TCO of the options proposed. Put simply, the evaluation must be more strategic and objective than "I do not like this", or "I do not think it can do it". The over-arching principle of committing to existing systems should be the default position, from which the City deviates only when there is a clear business case for the exception.

Departmental vs. Enterprise Business Systems Support

At Vaughan, in total over 200 applications are in operation. With over 200 applications, it is improbable for the City's ITM group to fully support all of the City's applications to the same standard.

ITM provides the network and server platform on which all the City business systems operate. ITM also provides any installation services for all such applications that reside on the City's servers.

However, in terms of "application support", the ITM strategy is to focus on the enterprise business systems; those systems that have a wide base of users and support corporate wide processes. ITM thus provides "application" support (administration, functional assistance, reporting, configuration, etc.) to the main enterprise systems.

It is generally acknowledged that it is not possible for IT to become familiar with the set up and functionality of 200+ line of business systems – though the model may not be formally defined, and clearly understood by all. The vendors, and the business users to some extent, are in a better position to provide such support. As well, most of these other lines of business systems are less configurable (there are fewer ways to set up the systems), and the business users use the system "as is". Thus, there is a reduced level of support required, other than perhaps ad hoc reporting. Therefore, there should be a clearer understanding of the roles and responsibilities. Systems other than the enterprise business systems are primarily supported locally (by business leads) or by vendors.

Appendix 2 - Enterprise Architecture Principles

In future, decisions the City makes must take a longer term, enterprise view. In support of the Enterprise Architecture, the City adopts a set of principles (see Appendix 2), which in turn will be built into the investment assessment process and the governance framework, discussed later. This will ensure that initiatives that fit the Enterprise Architecture will be encouraged and prioritized over initiatives that do not.

Principle	Rationale	Implication
Business Process Re-engineering or Optimization is built into technology projects.	The return on technology investments cannot be achieved if technology projects simply digitize old processes.	• Technology will not be implemented without business process review, and redesign • Business processes should be designed around customer needs, not City staff needs
We strive to use Common use applications	There is greater value in linking processes and people together, than having the perfect system. It increases cost and complexity to the City to operate many systems. We are seeking to break down departmental silos.	• We will try to minimize the number of business solutions we operate. • We will reuse before buy; buy before build • Departments will need a business case, to be reviewed by the IT Governance Committee + SMT, if they wish not to use a corporate solution where it is found to be a reasonable fit.
Information Open-ness	Data is a corporate asset that will be shared & accessible by all City departments, unless not permitted by law.	• We will set corporate data standards • Systems that reference these data subjects will be mandated to adopt the standard and adhere to the master data management scheme • We will create a single view of Customer / Property / Assets
Ease of use		• Tools will be accessible anywhere, anytime
Technology standardization (non-proliferation of technology)	The City aims to reduce costs through standardization and infrastructure simplification.	• Non-standard technology deployments will be avoided where practical • City will carry out consolidation

Principle	Rationale	Implication
		& virtualization • We will adopt open standards that are technology / vendor / platform agnostic
Interoperability		• We will adopt open, non-proprietary standards where possible
Security, Risk Management & Privacy	The City is responsible for and held accountable for information security, and maintaining privacy and confidentiality.	• We will set and enforce information security and protection standards for all data and technology that the City operates, without exception.
Partnership	The City will seek to reduce its costs, and implementation timelines by partnering across departments and with other government agencies on technology projects.	• Where common requirements between departments are identified, projects should be combined. • Partnerships should bridge across departments and across government tiers

Appendix 3 – Technology lifecycle classification

It is recommended ITM develop a lifecycle classification scheme similar to the one described here.

	PROTOTYPE			MATURE			SUNSET			Bypass
	1	2	3	4	5	6	7	8	9	0
Phone					VOIP				PBX	
Cell				Android 4.x	Blackberry, iPhone, WinPhone					Android 3.x
Cell phone	SharePoint 2013				Sharepoint 2010				Sharepoint 2003	Sharepoint 2007
Tablet			Surface	iPad						Playbook
Integration		Biztalk								
Desktop	Windows 8.1				Windows 7				Windows XP	Vista, Windows 8
Fax		iFax					Fax (analog)			
Network									Cisco VPN	
Office	Office 2013				Office 2010			Office 2003		
Server			W2012 R2			W2008 R2		W2003 R2	W2K	W2008, W2012
SQL DB		SQL 2012			SQL 2008 R2			SQL 2005	SQL 2000	
Oracle DB					Oracle 11			Oracle 10	Oracle 9	
Programming	.net 4.5				.net 4.0			.net 3.0	.net 1.0 + 2.0	
GIS		ArcGIS 10.2			ArcGIS 10.1			MapInfo, ArcGIS 9.x	ArcGIS 8.x	ArcGIS 10.0
Filesharing			Accellion							

In this scheme all technologies are categorized into one of three categories: Prototype, Mature or Sunset. As the technology evolves it moves from Prototype to Mature and ultimately to Sunset. Each category is further broken down into 3 sections, each of which has a specific meaning as described in the following table:

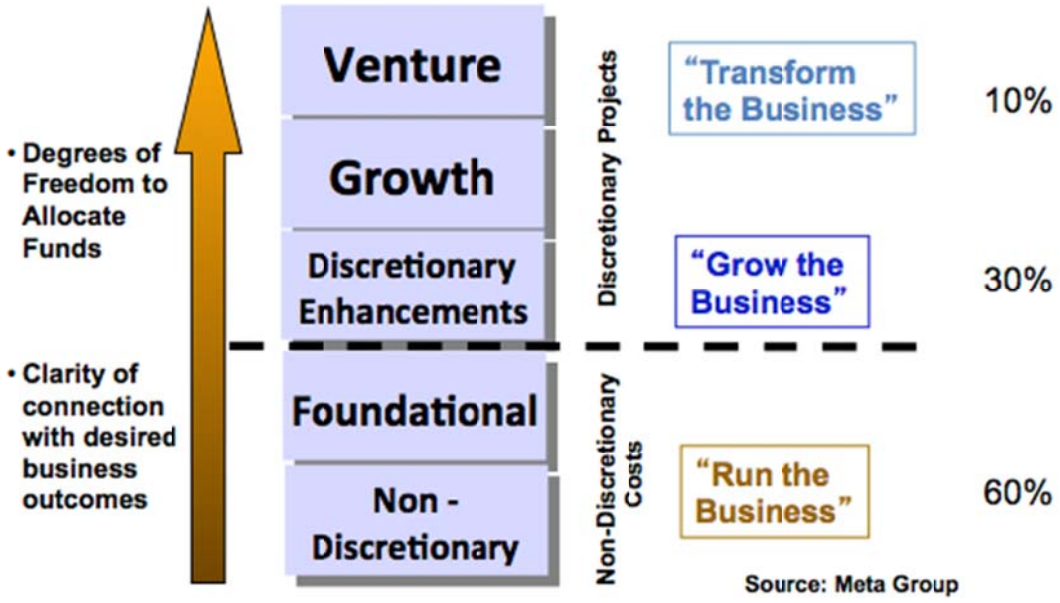
Lifecycle steps 1 – 9:

Step	Category	Description
1	Prototype	Initial entry for evaluation. Only select individuals can do this. The technology is contained and not allowed to connect to external systems for business processing.
2	Prototype	Small group evaluation. When moving to this stage the ITM Architecture and Standards team must be consulted.
3	Prototype	Official technical product evaluation. This is usually a signal of moving to purchase. Can involve general business users, however no core business processing is allowed.
4	Mature	Install, sanctioned business use. The technology is not yet for company wide use.
5	Mature	Company wide use. Service desk has full responsibility to support.
6	Mature	Company wide use. TMB moves to this level to signal an aging version / desire to evaluate options.
7	Sunset	Company still supports. However, if a new system is being brought online, it should not use this technology. Interfaces are signaled to start migrating off.
8	Sunset	System is actively scheduled for migration and/or replacement.
9	Sunset	Past due. Systems continuing to run on these platforms will need quarterly sign off by the CIO.
0	Bypass	There may be times that the City chooses to bypass a technology, for instance skipping Windows Vista for Windows 7

Appendix 4 – Establishing IT Investment Portfolios

Balancing IT Investments

The City needs to establish a stronger understanding of where it spends its IT dollars, and needs to influence change in this spending over time. To do this, the City will establish a set of investment categories and establish targets for the City's expenditures in each category.



The investment categories are described in the following table. Note that some investments are considered discretionary, and some non-discretionary. A further breakdown allows the understanding of whether expenditures or resource efforts are allocated to running the business or to the value added activities of growing or transforming the business.

	Investment Category	Investment Type	Description / Examples
Discretionary	Transform the Business	Venture	Blue-sky initiatives that have significant potential to enact major changes in the organization, but may also be associated with high risk.
	Grow the Business	Growth	Projects that deliver new solutions and services
		Discretionary Enhancements	Provide enhancements to existing services to address new process efficiencies and effectiveness that current assets cannot deliver.
Non Discretionary	Run the Business	Foundational / Core	Mission critical services includes, network services, data centre operations, IT vendor support, backup/restore, disaster recovery.
		Non-Discretionary	Impacts of growth upon consumption of core operational assets such as infrastructure (e.g. server, storage, network, database), operations and related IT services.

Project portfolio prioritization mechanisms that the City develops will utilize these categories. The City will also track expenditures and time across these categories. Over time the City will work to change the profile of its IT expenditures; reducing spend in core and non-discretionary categories, freeing up resources to allocate to efforts that can grow and transform the business.