OFFICE OF THE
City Auditor

Information Technology Corporate Audit

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THE CITY OF
Edmonton

The Office of the City Auditor conducted
this project in accordance with the
*International Standards for the
Professional Practice of Internal Auditing*

Information Technology Corporate Audit
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Information Technology Corporate Audit

Summary for City Council

Information Technology (IT) has become an integrated part of the City of Edmonton's business environment. The City is striving to be a leader in information technology as demonstrated by its efforts to provide IT services anywhere, to anyone, at anytime. The City is integrating information systems using strategies such as Enterprise Resource Planning (ERP), at the heart of which is the SAP system.

The Information Technology Branch is the business area primarily responsible for delivering the City's IT services, but the demand for and use of IT resources permeates the entire organization. Therefore, we conducted this audit as a corporate-wide audit to allow us to identify and assess all IT resources used in delivering City services.

The City has over 1,100 software applications, the support of which accounts for 53% or $44.7 million of total IT costs. On a Corporate basis, we estimate that the city spent $83 million in 2008 in combined operating and capital IT dollars, which represents 7.1% of the City's total operating expenditures. Our research and benchmark analysis indicates that the City's level of expenditures on IT resources is high relative to other local government organizations.

We observed that the City's IT services are skewed towards new initiative work, which currently represents 46% of all IT work. Our benchmark research shows that other government organizations have a higher focus on ongoing support (75% of the average government organization's IT budget) as opposed to new initiatives. During this audit, we surveyed selected managers in the City of Edmonton and learned that many of them believe that the City's information technology underperforms relative to their expectations. We believe this reflects a frustration that many of the new initiative projects are not meeting the originally intended objectives. We have recommended that the IT Branch Manager review all IT new initiative work and recommend an appropriate mix for new initiative and ongoing support work.

We further analyzed the City's use of contract IT resources. These resources are primarily engaged in new initiative work. In 2008, the City used three contract types with an estimated annual value of $16.2 million, which equates to approximately 86 full time positions. The City's internal staffing consists of 303 positions in the IT Branch and 34 IT positions in Inside Information (Help Desk). We estimated that the 2008 salary and benefit cost for each internal IT staff positions is approximately $90 thousand annually as compared to approximately $167 thousand annually for an IT contract position.

We observed that IT contract levels have increased in the last few years and we believe that the competitiveness of IT contracts requires further review. We also observed that some of those filling existing contract positions have worked with the City on an ongoing

basis for several consecutive years, which may not present the best value for the City. We have recommended that the IT Branch Manager review staffing levels and develop a resourcing strategy to address these issues.

We reviewed the City's IT governance framework structure and believe it does not facilitate effective decision-making. We reviewed completed and proposed IT projects and observed inconsistent business case analyses. We observed that the City did not comply with its own Project Management Policy for some of the business cases we reviewed. We further observed that business cases did not exist for IT projects where Capital Budget funding was already approved and some IT capital projects that are underway did not have positive business cases. We also found that budget estimates used in business cases were lower than the funds approved in the Capital Budget.

Finally, we observed that the demand for IT projects arises not only from the IT Branch, but also from other Departments. While this is necessary to ensure operating needs can be brought forward, we believe that all City IT projects should be prioritized using a single, consolidated mechanism. Our recommendation calls for the Corporate Services General Manager to develop an IT Governance Framework that will address these issues from a corporate perspective.

Information Technology Corporate Audit

1. Introduction

The Information Technology Corporate Audit was approved by City Council as part of the 2009 Office of the City Auditor's (OCA) Annual Work Plan. Information Technology (IT) is integrated into all of the City's business activity and IT costs permeate the Corporation.

2. Background

2.1. IT Environment

Growing IT Assets

Business areas within the City continually seek to use information technology to increase operational efficiency and as a means to connect to their customer bases. Conceptually, the IT Branch delivers a strategic asset through a shared service delivery model. The City is growing this strategic asset and similar to other infrastructure assets, future investments will be needed to maintain, refurbish, and replace this asset as it ages.

IT Infrastructure

The City uses an internal website and its computer network to securely share the organization's information with its employees. Each year, the City's IT environment is expanding to offer more web-based services to connect directly with citizens and businesses. The sharing of selected City information externally with citizens and businesses presents a security challenge, which the IT Branch has recognized and is acting upon. Another major challenge in the IT environment is the demand for a mobile data environment to further capitalize on the benefits of investment in IT.

As of December 31, 2008, the City maintained 6,192 personal computers, of which 1,204 (19%) were laptops, indicating that the city has a significant mobile work force. This mobile environment also includes supporting the City's fleet of mobile equipment, which continuously transmits field data to various computer applications.

Computing Systems

Because some computers are used by multiple users, the IT Branch supports over 7,800 internal computer users on a network that includes 218 network sites.[1] It also

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[1] Network sites are physical locations, such as office buildings or warehouses that are connected to the organization's network and are supported by the IT Branch.

provides maintenance and support to over 1,100 different software applications. These applications can be categorized into three main categories: (1) pillar applications, (2) departmental applications, and (3) shrink-wrap software. Pillar applications are corporate or enterprise-wide applications used by a large number of users. The majority of IT resources are dedicated to the support and development of these applications. Departmental applications are smaller applications developed for and used primarily by a single department or business area. Shrink-wrap applications are generally smaller, off-the-shelf applications used for specific business area needs.

Managing multiple software applications that must share data creates another challenge for the IT Branch. The City has embraced enterprise resource planning (ERP) as an application management strategy aimed at integrating its software applications to form a single virtual system. At the core of the City's ERP strategy is SAP, which is the City's largest software application system. The City began using SAP in 1995 primarily as a financial system and over the next five years expanded its use to include purchasing and inventory management and accounts payable and receivable. In 2003, the City's major SAP initiative called MainLink combined a number of existing departmental maintenance management applications into a single corporate-wide maintenance management system. In 2007, another SAP corporate initiative called PacMan was undertaken to develop corporate-wide project and contract management functionality. In 2008 and 2009, SAP was used to enhance the City's corporate asset accounting and to implement the 311 citizen call centre. Over the last 14 years there have been many smaller SAP initiatives completed to meet business systems needs.

The City's other pillar systems include PeopleSoft, POSSE, and SLIM. PeopleSoft is the City's human resource management system. Purchased in 1994, this system is used to manage all payroll functions, employee records, and benefits. POSSE (Planning One Stop Services) was developed in 1994. This system is a workflow and document management system used primarily to facilitate the land and property development process. SLIM (Spatial Land Inventory Management) was developed in 1999 and is the geographical based system used to manage all City land-related records.

Tangible Capital Assets

In June 2006, the Public Sector Accounting Board (PSAB) approved changes in public accounting standards, requiring capital expenditures to be recorded as an asset and amortized over their estimated useful lives (effective January 1, 2009). PSAB indicates that tangible capital assets include such diverse items as roads, buildings, vehicles, equipment, land, water systems, aircraft, computer hardware and software, dams, canals and bridges.

The City is currently not recognizing the full valuation of its tangible capital asset base. In order to address this new PSAB accounting requirement, the City established a Tangible Capital Asset project team and are working to meet the new municipal recording and reporting requirements. New initiative work within corporate IT expenditures is considered additions to the City's Tangible Capital Asset base.

2.2.   IT Governance Framework

Governance Structure

In 2002, the City created a new IT Governance Structure to ensure that business priorities, emerging needs, and on-going projects were managed to support the City's objectives. The IT governance model included three key committees: an IT Governance Committee, a Business Council and a Technical Council. The IT Branch Manager, who is also the City's Chief Information Officer (CIO), sat on all three of these committees. The following were the specific roles and responsibilities of each committee:

- The IT Governance Committee was comprised of the Senior Management Team, the CIO, and the Chair of the Business Council. Its roles and responsibilities included: (a) approving information technology strategies, plans, and policies, (b) ensuring alignment with Corporate Strategies and Plans, (c) approving the annual IT Corporate Strategic plan, and (d) approving IT policies and procedures.
- The Business Council was comprised of Departmental representatives, the e-Business Manager, the ERP Program Manager, and the CIO. Its roles and responsibilities included: (a) setting priorities for resourcing and funding IT Projects and programs, (b) recommending approval of IT strategies, plans, and policies to the IT Governance Committee, (c) resolving issues and conflicts pertaining to IT initiatives, and (d) measuring results and benefits of IT projects and programs.
- The Technical Council was comprised of the CIO, the Business Council Chair, and IT Management. Its roles and responsibilities included: (a) recommending infrastructure technology direction, (b) identifying current IT trends and issues, and (c) preparing IT policy, plans and procedures.

The City's IT governance structure has evolved over the past seven years to the current model where the Business Council and Technical Councils have been disbanded, but the Senior Management Team and the CIO continue to serve as the IT Governance Committee. However, this committee does not have a current Terms of Reference or a clear statement of respective roles and responsibilities. Other sub-committees, such as the Application Working Committees and Business Improvement Committees continue to support the IT Governance Committee at an operational level.

Strategic Vision

In 2004, the IT Branch brought forward the three-year (2005-2007) *Corporate IT Strategic Plan, Business Drives IT*. This plan was developed by the IT Branch in partnership with representatives from all Departments. The objective of that *Corporate IT Strategic Plan* was to develop actionable and tangible strategies that align with business objectives and to set the City's information technology directions for the next three years. The IT strategic vision identified in this plan is stated as follows:

"A secure environment providing direct, authorized access to consistent integrated information by anyone, anytime, anywhere, using any enabled device." Currently the IT Branch is developing a new strategic vision to replace this strategic plan which is outdated.

In addition to the Corporate IT Strategic Plan, each year the IT Branch works with each department to develop a Departmental IT Strategic Plan to identify individual departmental needs.

2.3.   IT Branch Organization

The IT Branch is one of seven branches within the Corporate Services Department, providing shared services to business areas within the organization. The IT Branch, with 303 full-time equivalent (FTEs) staff members, is organized into sections that provide strategic, operational, and development services. The Branch Manager and his management team are currently considering changes to the existing organizational structure.

Following is a description of the IT Branch as of January, 2009.

IT Branch Business Areas

Office of the Branch Manager (CIO) (15 FTEs): This business area is comprised of the Branch Manager and Strategic Advisors. Their primary responsibility is setting and managing the strategic direction of the IT Branch.

Application Maintenance and Support (68 FTEs): This business area is responsible for the ongoing maintenance and support of software applications and associated databases that are supported by the IT Branch.

Operations (79 FTEs): This business area is responsible for managing IT infrastructure such as application servers, network storage, data networks and telecommunications. This business area also certifies all new software applications for compliance to the City's computer standards prior to deployment on users' desktops.

Service Delivery (13 FTEs): This business area is responsible for customer service delivery and includes the Service Delivery Coordinators who work with each Department on Information Technology delivery. This section includes the Problem and Change area, which provides a quality control function ensuring all system changes are managed and system problems are appropriately tracked and resolved.

Vendor Management and Strategic Partnerships (20 FTEs): This business area has two main functions. The IT Contracts, License & Vendor unit manages hardware and software installations, hardware moves, and asset changes. The Budget and Administrative Support Services unit handles the budget and administrative functions of the IT Branch.

Business Systems Support (19 FTEs): This business area includes; Enterprise Application Training, Enterprise Process and Application Advisors, SAP & PeopleSoft Product Management and the Business Intelligence Program Office. The section's primary function is to provide the required support to departments to enable them to effectively use the City's enterprise applications.

IT Planning and Architecture (16 FTEs): This business area sets the strategic direction for the IT Branch including the enterprise architecture and business continuity. It also provides the framework for maintaining continuous improvements in IT. In addition, this business area provides expertise in web, desktop, workflow and spatial technologies, as well as managing the City's spatial data services, which provide revenue for the Branch.

Technical Solutions Delivery (73 FTEs): This business area is responsible for the project management and delivery of IT projects. In 2008, the area indicates it has delivered approximately 200 IT projects to client departments.

2.4.   IT Corporate Resources

The City's use of IT resources is not limited to the IT Branch. There are also departmental operating expenditures for IT activities such as software licensing and personal computer costs. Additionally, both the IT Branch and Departments have identified IT capital projects to meet their individual needs. Details of these cost areas are included in the following sections.

2.4.1.   IT Branch Operating Budget

Figure 1 illustrates the IT Branch's actual expenditures from 2004 to 2008, and the 2009 budgeted expenditures. From 2004 to 2008, gross expenditures have increased by 25% from $29.3 to $36.7 million. The 2009 budget represents another 10.4% increase from the 2008 IT Branch costs. The 2009 IT Branch budget includes provision for a staff complement of 303 full time positions.

Figure 1 - IT Branch Operating Expenditures (Years 2004-2009)

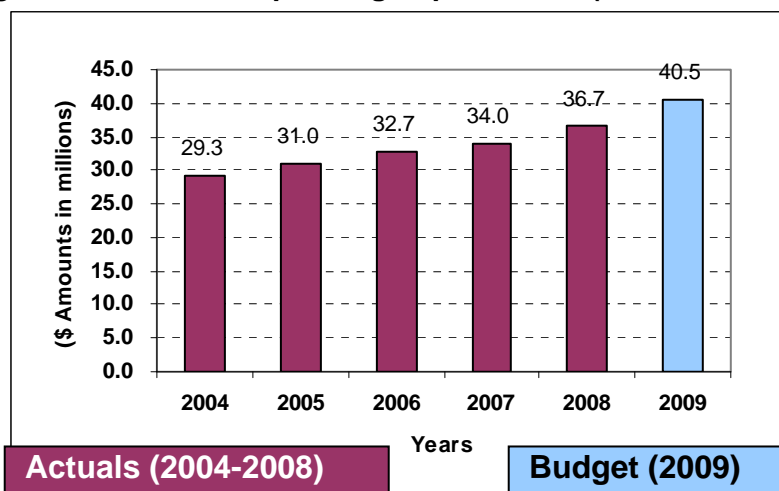Table 1 illustrates that the majority of the IT Branch operating costs are for personnel, which is 72% of the IT Branch budget. $4.7 million in interdepartmental charges (cost recoveries) is received from utilities such as Drainage, MES, and Waste Management. Additionally, the IT Branch budgeted for $361,000 of outside revenues in 2009 primarily from Geo-Edmonton Spatial Data Services (a City service that sells electronic maps).

Table 1 - 2009 IT Branch Operating Budget

Category	2009 Budget ($ 000's)	Percentage of Expenditure Total
Personnel	29,357	72%
Material & Equipment	7,877	19%
Services	1,464	4%
Other & General Costs	1,844	5%
Total Expenditure	40,542	100%
Interdepartmental	(4,714)	
External Revenues	(361)	
Net Position	**35,467**	

2.4.2.   IT Costs within Department Operating Budgets

Table 2 shows IT items budgeted in departmental operating budgets. IT hardware and software licensing budgets reside with Departments, but are sourced and deployed through the IT Branch. In 2007, the IT Help Desk, which is the front line for IT application and computer support, was moved from the IT Branch to Inside Information, Customer Information Services Branch. Thirty-four staff members provide IT Help Desk support services.

Table 2 – Estimated 2009[2] IT Resources in Departmental Budgets

Category	2009 Budget ($ 000)	Description
Personnel	3,686	Estimated IT costs for positions associated with IT related functions such as methods analysts, data analysts and Help Desk
Material & Equipment	9,554	Computer hardware purchases, software licenses, multi-functional printers and copiers
Other & General Costs	5,645	Telephone, cellular and computer circuits
Total Expenditure	**18,885**	

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[2] OCA compiled and calculated as these expenditures are not currently recorded and reported by the City.

2.4.3. Capital Budgets

Table 3 provides a summary of IT Capital needs identified by both the IT Branch and the departmental business areas. An average of $24 million in IT capital expenditures is planned for each of the next five years. To complete this capital project work, the City relies heavily on contract resources.

Table 3 - Capital Budget IT Expenditures

Category	Capital Budget* ($ 000)					
	2009	**2010**	**2011**	**2012**	**2013**	**2009-2013 Total**
IT Branch Capital Projects	8,694	9,814	8,714	9,688	9,658	**46,568**
Departmental IT Capital Projects	15,132	17,860	17,766	11,227	10,334	**72,319**
Total IT-Related Capital Projects	**23,826**	**27,674**	**26,480**	**20,915**	**19,992**	**118,887**

*Note: 2009-2011 funding is approved; 2012-2013 are identified budget requirements.

2.4.4. Total Corporate IT Costs

The total budgeted costs of information technology for the City of Edmonton in 2009 are approximately $83 million dollars as summarized in Table 4.

Table 4 – 2009 Total Corporate IT Budget

Category	2009 Budget ($ 000's)
IT Branch Operating Costs	40,542
Estimated IT Resources within Department Operating Budgets	18,885
Capital Budget Projects (both IT Branch and Departmental)	23,826
Total Estimated Corporate IT Costs	**83,253**

3. Objectives, Methodology and Scope

3.1. Audit Objectives

Our overall objective was to review and analyze the City of Edmonton's investment in Information Technology.

Our audit focused on the following objectives:

1) To assess whether corporate resources (operating and capital) are being used in an effective and efficient manner to deliver IT services.

2) To assess the effectiveness of the IT Governance Framework in prioritizing and allocating operating and capital resources for information technology.

3.2.   Methodology

We performed our audit in accordance with the *International Standards for the Professional Practice of Internal Auditing*. Following are the major audit steps we conducted to meet our objectives:

Risk Assessment

This audit included a comprehensive risk identification and assessment of the Corporate IT environment. During the planning stage, we consulted with the IT Branch to understand the current IT environment. This included identifying and discussing IT business risks and completing a preliminary assessment of the controls in place to address those risks.

IT Governance Review

We reviewed and assessed the current IT governance framework including structure, roles and responsibilities. We also identified the key outcomes expected from good IT governance and researched other organizations' approaches to IT governance. As part of the IT governance review, we also interviewed selected stakeholders regarding the City's current IT governance model to identify opportunities for improvement.

Business Case Analysis

As an extension of the IT governance review we reviewed the decision-making model which is fundamental to setting strategic direction for the organization. To this aim, we identified business case criteria and assessed a sample of IT capital projects against this criteria.

Costing Model

A major challenge in this audit was to quantify all corporate IT costs. We prepared a detailed costing model of the City's 2008 IT expenditures. We then analyzed the City's IT costs to determine how the City uses its resources to deliver IT services.

Research

We used three primary sources of government benchmark data in this audit to assess the City's use of information technology: Gartner Inc., Computer Economics Research Group, and IT Governance Institute (See the Appendix for more detailed information).

IT Survey

During the audit, we also surveyed the City's management staff to obtain their feedback on IT performance and governance. Significant results from this survey are presented and discussed in this report.

3.3.   Audit Scope

In Scope

Since information technology is a corporate-wide resource, all IT activities across the corporation were in scope. This includes activities within the IT Branch as well as those within City departments. Our review of operating expenditures included expenditures from 2004 to 2008 as well as planned 2009 expenditures. Our review of capital expenditures included past capital projects and also planned capital expenditures from 2009 to 2013.

Out of Scope

We excluded IT activities relating to the Edmonton Police Service, the Edmonton Public Library and Edmonton Economic Development Corporation.

4.   Observations

4.1.   IT Strategic Vision

The IT strategic vision stated in the *2005-2007 Corporate IT Strategic Plan* was:

> A secure environment providing direct, authorized access to consistent integrated information by anyone, anytime, anywhere, using any enabled device.

It is incumbent on the IT governing body to require accountability for results that demonstrate progress toward the strategic goals and vision. Overall, we believe the IT Branch and the City have made progress towards the corporate IT strategic vision. The Enterprise Resource Planning (ERP) strategy provides the best example of how IT is trying to achieve "consistent integrated information." In delivering IT services "anywhere," the City has created an infrastructure of over 200 wireless network access points and is providing mobile devices to staff who work away from their offices. With regard to "anytime" services, the City's IT services are available seven days a week, twenty–four hours a day with higher than 99% reliability. Finally, in delivering IT services to "anyone," the City has been steadily increasing its web-enabled presence and connecting the City to citizens and businesses.

The City's efforts towards this IT strategic vision cost $83 million in 2008. As the City continues to implement these strategies, we anticipate increased demands for IT capital and operating costs. Many of these demands are driven by City Departments who seek to use IT to increase operational efficiency. Such efforts are aligned with the IT Branch's 2005-2007 Strategic Plan, *Business Drives IT*.

4.1.1.   IT Performance

The OCA surveyed a wide range of managers to gain insights into management's perspective on the City's information technology operations and project performance.

We asked managers, "Which statement relates most closely to the performance of information technology in your operations?"

Table 5 compares our survey results to IT Governance Institute results. The survey data points to significant performance issues in the City when compared to other government organizations. For example, 59% (6 out of 10) of the managers we surveyed believe the City's information technology under-performs or significantly under-performs compared to only 26% in the IT Governance Institute survey.

Table 5 – Satisfaction with IT Performance

Scoring System / Attribute	OCA Survey (%)	Governance Institute Results* (%)
IT significantly out-performs our expectations	1	2
IT somewhat out-performs our expectations	3	13
IT performs in line with our expectations	33	58
IT somewhat under-performs compared to expectations	48	21
IT significantly under-performs compared to expectations	11	5
Do not know	4	1

*Source: An Executive View of IT Governance, 2009 IT Governance Institute, PWC.

We asked managers, "To what extent would you agree or disagree that information technology investments have created value for your operations?"

As shown in Table 6, 67% of managers surveyed strongly agree or agree that IT investments have added value to their operations; somewhat lower than the IT Governance Institute results (74%). In addition, 18% of the managers indicated that they disagree or strongly disagree with the statement compared to only 4% in the IT Governance Institute results.

Table 6 – Satisfaction with Value Created

Scoring System / Attribute	OCA Survey (%)	Governance Institute Results* (%)
Strongly Agree	17	36
Agree	50	38
Neither	15	22
Disagree	15	3
Strongly Disagree	3	1

*Source: An Executive View of IT Governance, 2009 IT Governance Institute, PWC.

4.2.   IT Investment

4.2.1.   Corporate IT Costs

The following analysis of Corporate IT costs is based on 2008 actual costs. Table 7 shows that in 2008, the City spent $83 million on IT Branch and departmental IT from capital and operating budgets combined. In our background information we provided details on planned 2009 expenditures which also equated to $83 million.

Table 7 - 2008 Corporate Cost Analysis (All figures in thousands)

Computing Category	Sunk Capital Cost prior to 2008*	2008 IT Corporate Capital Costs	2008 IT Corporate Operating Cost	2008 Total Capital and Operating Costs	Planned Capital 2009-2013
Major Software Systems (5)					
SAP	30,789	8,750	6,330	**15,080**	3,154
PeopleSoft	1,400	905	2,638	**3,543**	12,722
SLIM	5,614	1,330	2,318	**3,648**	3,285
POSSE	4,096	1,877	1,750	**3,627**	1,903
TACS	2,196	66	642	**708**	8,500
Secondary Software Systems (approximately 200 systems)	n/a**				
AMS Oracle (Excl. TACS)	n/a	1,356	2,232	**3,588**	9,851
Vendor Apps	n/a	2,089	2,606	**4,695**	7,526
MS/Powerbuilder	n/a	144	1,614	**1,758**	1,925
Corporate (ie. E-Business)	n/a	3,617	4,256	**7,873**	
User Supported Software Systems - Shrink-wrap/Off the shelf (approximately 900)	n/a		184	**184**	
Subtotal - Software	44,095	20,134	24,570	**44,704**	48,866
Administrative (Clerical/Financial)			2,270	**2,270**	
Hardware (Servers, Networks, Infrastructure, Deployment)	n/a	7,064	17,757	**24,821**	65,545
Telecom	n/a	600	6,582	**7,182**	4,476
Other			4,242	**4,242**	
TOTALS	44,095	27,798	55,421	**83,219**	118,887

*Summation of past capital expenditures, not in net present value form
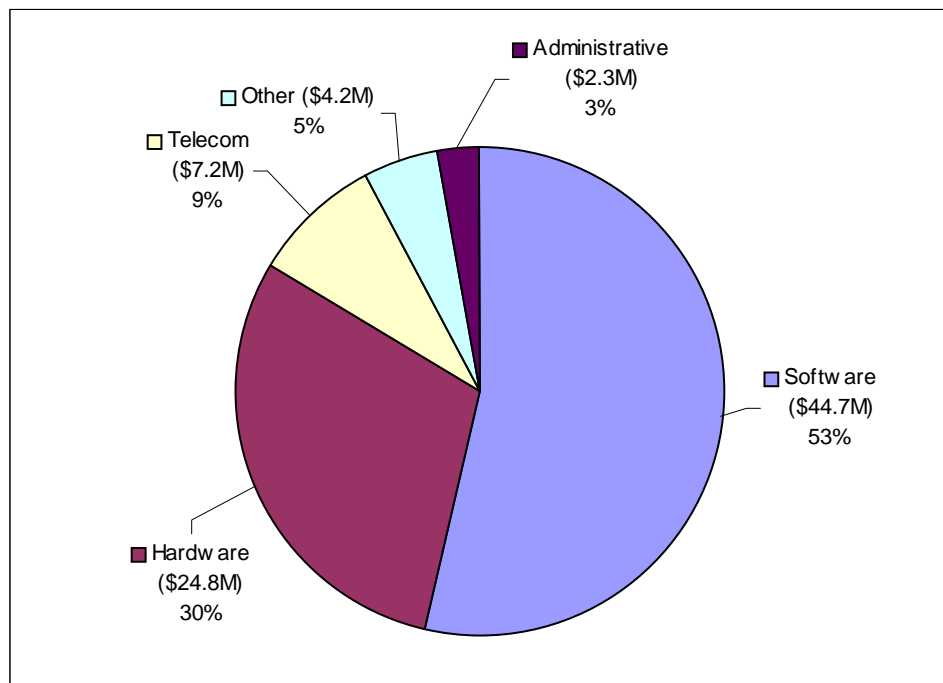** n/a – not available

The sunk capital cost of all Corporate IT systems is not accurately known. For the major ERP systems costs, we were able to gather information to indicate that the City spent approximately $44.1 million prior to 2008. In 2008, it spent an additional $20.1 million on Corporate IT software capital costs. There is an additional $48.9 million planned in capital projects for Corporate IT systems over the next five years.

SAP, the City's largest software application, has cost approximately $40 million in capital expenditures to the end of 2008. The amount of operating expenditures annually invested into computing systems is significant, but a firm figure is not available under the City's present project management and accounting practices. In 2008 alone, SAP cost $15 million in combined capital and operating costs.

4.2.2.   IT Category Costs

Software application support and license maintenance costs accounted for 53% ($44.7 million) of all 2008 IT costs as shown in Figure 2. Hardware costs, which include servers, networks, and infrastructure costs, account for 30% of total costs. Telecom costs, which include telephone and network lines, are 9% of total costs. A further analysis of software costs shows that the five major software systems account for nearly 60% of all software application support and license maintenance costs, with secondary software accounting for 40% of total software costs.

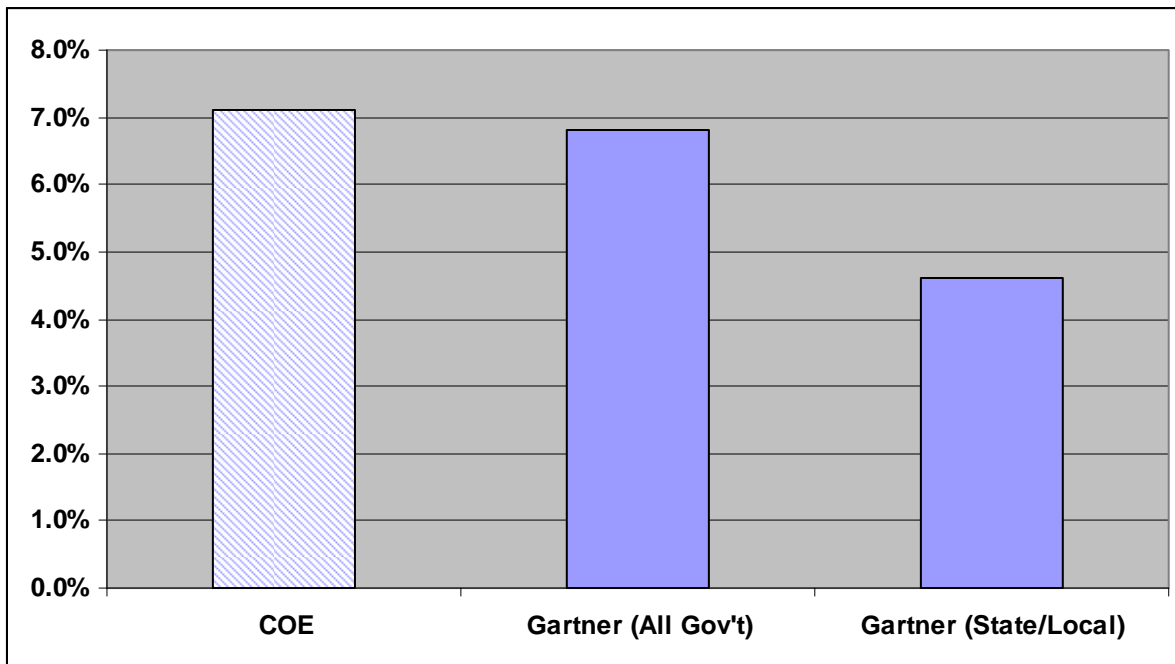**Figure 2 - 2008 IT Corporate Category Costs**

4.2.3.   IT Spend Ratio

IT spending and staffing are affected by many factors. Some organizations may be highly dependant on support from IT while others may have little automation. The City has used benchmarks in the past to compare their investment in IT. In 2005, Gartner Inc. was engaged by the City to conduct a comparison of the City's IT Branch expenditures with a government peer group and a cross-industry peer group. This study used a methodology that compared the cost of standardized workloads. This study overwhelmingly showed that the IT Branch was providing services at a reduced cost compared to the benchmarks.

However our review was at a corporate expenditure level since much of the IT expenditures are initiated by departments outside the IT Branch. Additionally, the departmental infrastructure ultimately ends up being supported by the IT Branch.

Total IT corporate spending as a percentage of corporate operating expenses is helpful in understanding the relative level of corporate IT investment. The City's total IT spend in 2008 was an estimated $83.2 million. The City's total operating costs were $1.17 billion, resulting in a total IT spend ratio of 7.1%. As shown in Figure 3, the 2008 Gartner benchmark data indicates that the total IT spend relative to organizational operating budget was 6.8% for government and 4.6% for local government.

Figure 3- 2008 Government IT Spend as a % of Operational Expenses

IT Industry Trends
Recent studies conducted by Computer Economics and Gartner Inc. indicate that investment in corporate IT spending will be reduced in the short term.

The Computer Economics 2008/2009 Trends Study stated that:
- IT spending growth is slowing in response to economic conditions.
- IT capital spending growth rate falls to zero.
- Hottest priorities involve service levels, risk reduction, and cost management.
- Organizations are holding the line on IT staff headcount.
- Companies continue to outsource more IT work.

This is further corroborated by Gartner's 2009 Business Executive Survey:
- CIOs plan for spending restrictions into 2010, and are assessing 10% to 20% cut scenarios.
- CIOs refocus portfolio for the shorter term: slow, phase or freeze long-term initiatives.
- Organizations are re-assessing IT projects that are dependent on additional staff and capital equipment.

In the following sections of the report we identify those areas where we believe the City can adjust its IT investment to more closely align with the local government benchmark total spend ratio.

4.3.   Ongoing Support versus New Initiatives

4.3.1.   Defining Ongoing Support and New Initiatives
The Capital Budget dollars the City spends are not the only source of funding to build the City's IT asset base. A significant portion of the investment comes from Department operating budgets as well. A major exercise in this audit was to determine the mix of Corporate IT resources used for ongoing support versus new initiatives. Our methodology included validating the allocation of resources between ongoing and new initiatives with IT management.

Ongoing support refers to those activities needed to continue operating existing systems and capabilities to support the business. This includes daily operations, routine maintenance, bug fixes, regulatory compliance, and supporting normal growth of the business or what is otherwise known as "repair or maintenance."

New Initiatives include implementing new systems and IT capabilities otherwise known as "betterments." Betterment is a cost incurred to enhance the service potential of a tangible capital asset. Service is enhanced when:
- A previously assessed physical output or service capacity increases.
- Associated operating costs are lowered.
- Useful life of the property is extended.
- Quality of the output is improved.

4.3.2. City IT Investment Levels

We reviewed the 2008 operating and capital costs and categorized expenditures as either ongoing support or new initiatives. A mix of both ongoing functions as well as new initiative functions exists in both the operating and capital costs as shown in Table 8.

Table 8 – Corporate Funding for Ongoing Support vs. New Initiatives ($ 000's)

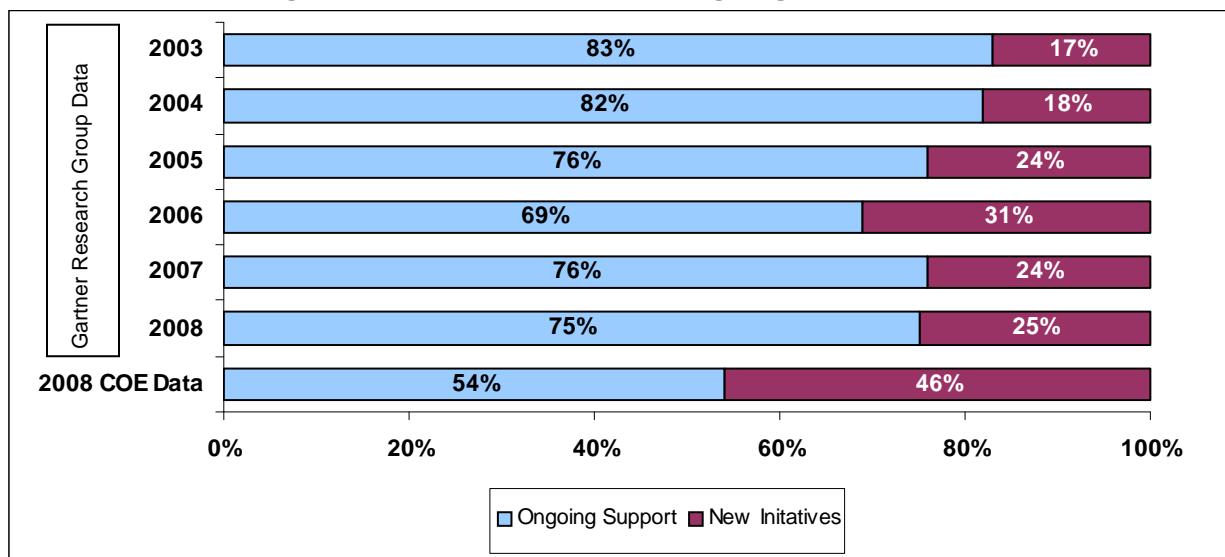| Funding	Ongoing Support	New Initiative	Total
Operating Budget	$37,117	$18,304	**$55,421**
FTE's	*203**	*134*	*337*
Capital Budget	$7,941	$19,857	**$27,798**
Totals	$45,058	$38,161	**$83,219**
Percentage	**54%**	**46%**	**100%**

*203 FTE's includes IT Help Desk (Inside Information)

The results shown in Table 8 indicate that 54% of total corporate IT dollars went towards ongoing IT support and 46% went toward new initiatives. As expected, the majority of capital dollars ($19.9 million) was spent on new IT initiatives. Within the IT capital program there were $7.9 million in projects of an ongoing nature such as Information Management Infrastructure, which serves to replace obsolete computer components (servers, storage) but does not necessarily enhance or create new capabilities. Within departmental operating budget expenditures, $18.3 million in IT operating funds was directed towards new initiatives, which included 134 FTEs. Operating dollars contribute nearly one half of the total cost for new initiative work.

4.3.3. Benchmarking the City

Our comparison with the Gartner government benchmark is shown in Figure 4. The City's spending level of 46% ($38 million) for new initiatives is significantly higher than the benchmark average government spending of 25% on new initiatives.

Figure 4 - Gartner Research - Ongoing Vs. New Initiatives

As shown in Table 8, the City spends $38 million on new initiative work each year, which at 46% of all IT work, is significantly above the government benchmark of 25%. We are recommending that the IT Branch Manager review all IT "New Initiative Work" and develop an appropriate mix for New Initiative and Ongoing Support work. Once the desired mix is determined, staff and contract resource levels should be adjusted accordingly.

There are many options for the City to adjust this workload mix. One option is to defer lower priority capital projects and reallocate associated IT operating resources to ongoing support. Another option would be to defer new capital work and also reduce the associated operating expenditures. This second option would result in a greater reduction in the total IT corporate expenditures.

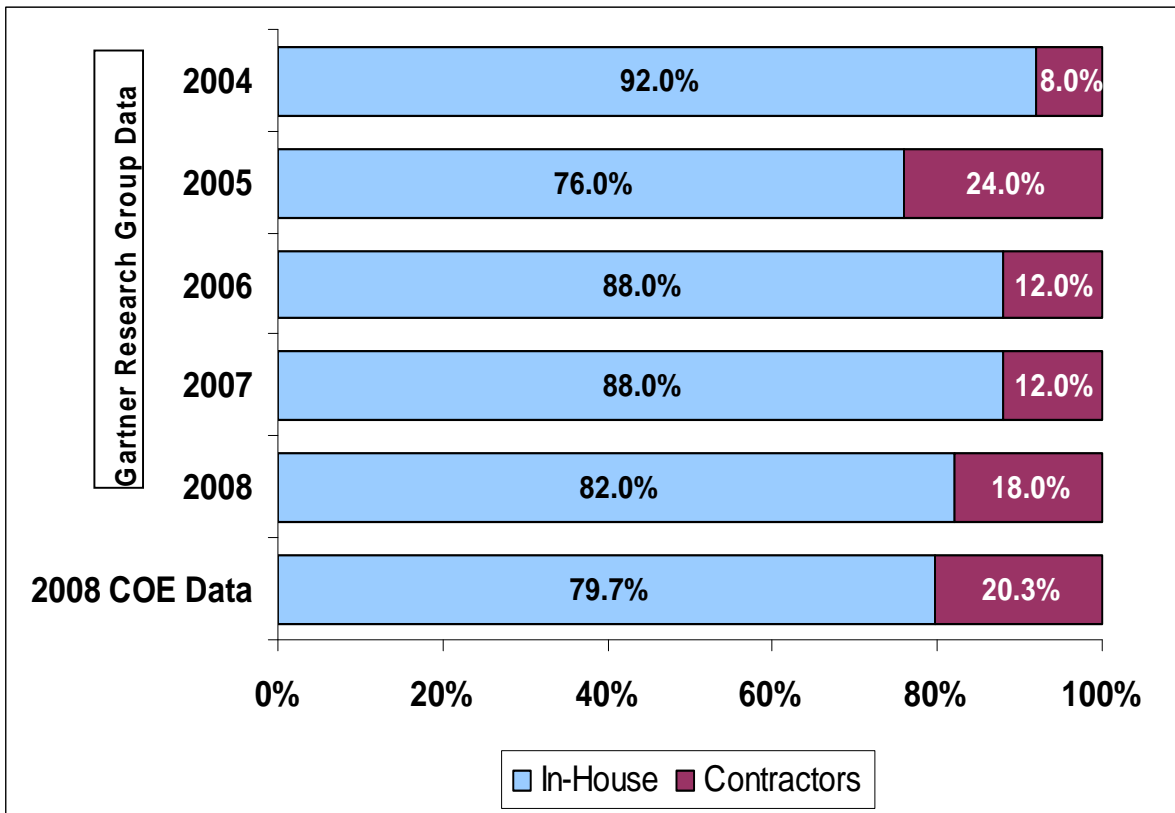| Recommendation 1	Management Response and Action Plan
The OCA recommends that the IT Branch Manager review all IT "New Initiative Work" and recommend an appropriate mix for New Initiative and Ongoing Support work to the IT Governance Committee. Once the desired mix is determined, staff and contract resource levels should be adjusted accordingly (see Recommendations 2 and 3).	**Accepted** **Comments:** The IT Branch Manager and IT Leadership Team review the "New Initiative" work on an ongoing basis to ensure the appropriate resources are available with both technical and business knowledge to participate in projects. The "mix" of resources assigned to new versus ongoing support has not been reviewed in the past. The IT Branch Manager will review the mix for new initiatives and ongoing support that the IT Branch is responsible for and recommend to the IT Governance Committee any adjustments to the mix. This review will be completed for the projects starting in the 2010 budget year and will continue on an ongoing basis. The mix may continue to be above the benchmark until normalization can naturally occur. The IT Branch Manager will also make resources available for departments who wish to review their mix of resources applied to "New Initiatives" vs ongoing support for departmental IT systems. **Planned Implementation:** December 31, 2009 **Responsible Party:** IT Branch Manager

4.4. IT Contract Resources

Using the figures provided in Table 8, the City's ratio of actual spending on IT capital ($27.8 million) to IT operational spending ($55.4 million) is 50.2%. In addition, planned IT capital expenditures for the next five years is approximately $119 million ($24 million annually), providing an indication of the rapid pace of the City's IT capital investment. In 2008, the City's planned IT Capital Budget was $49 million, of which only $27.8 million was spent. The prioritization and ability to complete IT projects needs to improve and is addressed in section 4.7, IT Governance.

Much of the IT capital program is expedited with the use of contract resources. The City uses three primary IT contract resource types to supplement internal IT staff resources where specialty skills are needed or are not available internally.

As shown in Figure 5, the City's percentage of contractors at 20.3% is slightly above the government benchmark of 18% for 2008, although this percentage varies from year to year. Contractors are primarily engaged in new initiative work and funded largely through the City's capital budget. In the next section we analyze each of the IT contract types.

Figure 5 – In-House Vs. Contractors

4.5.   Contract Sourcing

The City uses three types of IT contract sources, which are described in the following sections.

4.5.1.   Staff Augmentation Contract

The IT Staff Augmentation Agreement was created under a Strategic Sourcing[3] strategy. This strategy was intended to achieve savings by improving operational efficiencies and leveraging purchasing power by using a larger single tender versus many small tenders. In 2005, prior to the IT Staff Augmentation implementation, 26 contracts were issued at a value of approximately $3 million. In 2008, the City spent approximately $8.7 million under the Staff Augmentation Agreement. IT Contractors, worked approximately 94,000 hours in 2008 which is the equivalent of 52 full time positions. We estimate that the annual cost of an IT contract position is approximately $167 thousand as compared to approximately $90 thousand annually for an internal IT staff position for salary and benefits.

The staff augmentation contract structure consists of a primary vendor with three secondary vendors. The primary vendor facilitates the automated contract resource procurement process for required IT positions identified online by the City. The secondary vendors submit available candidates for consideration for required staff positions. All applicable opportunities are submitted to the primary vendor who forwards selected candidates who are then interviewed and selected by City IT managers.

The primary vendor completes all timekeeping and bills the City on a monthly basis for work done. Payment is based on a fixed rate schedule that depends on skill sets and experience. The fee schedule is reviewed on a yearly basis to ensure that the rates are competitive. The primary contractor is responsible for paying secondary vendors. Included in the current fixed rate is a charge of $4 per hour for each contractor hired under this model. We estimated that the City's total cost for this intermediary service is approximately $376,000 annually based on approximately 94,000 annual contract hours billed in 2008.

In reviewing this arrangement we observed that the primary vendor also acts as a secondary vendor, which we believe is not an independent relationship. We further reviewed the RFP specifications for this agreement and observed a specific clause permitting the primary vendor to compete with the secondary vendors on all opportunities. We reviewed the level of contracts distributed between the three secondary vendors and did not find any evidence of internal favouritism. For example, in 2008, the vendor who acts as the primary and secondary vendor received equal contract work to that of the other two secondary vendors.

We believe that the staff augmentation contract should be revisited to consider expanding the City's opportunities to a larger number of secondary vendors. Under the

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[3] Strategic Sourcing is a procurement strategy whereby similar business needs are bundled in order to achieve purchasing leverage and obtain savings when tendered to the market.

current model only three vendors, who qualified as secondary vendors, have the ability to compete for this work, which as stated earlier, has grown from $3 million in 2005 to $8.7 million in 2008.

Table 9 provides a comparison of the Staff Augmentation contract rates and City rates. The contract positions tend to be of a more specialized nature and the hourly rates are much higher than City labour rates. City IT position descriptions are much more general than contractor descriptions making it difficult to conduct a direct comparison. However, we believe that a general comparison shows the high cost of using contract resources as opposed to City staff for IT work.

Table 9 – Comparison of 2008 Staff Augmentation Rates to City Labour Rates

	Position	Low End $/hr*	Mid Range $/hr*	High End $/hr*
Staff Augmentation Contract Rates	Application Development	57.21	71.71	82.84
	Database/Data Warehouse	61.16	76.12	90.16
	Network & Infrastructure	71.02	88.28	102.18
City Rates	Business Process Analyst	45.59	52.57	57.59
	Methods Analyst 2	40.79	46.81	51.55
	Systems Analyst 3	47.22	54.44	59.64

*The City rates include an additional 20% for benefits.
* Staff augmentation rate includes a $4 per hour sourcing fee.

In reviewing staff augmentation usage, we also observed that several contractors have worked with the City in the same positions for several consecutive years. We believe that if the City has a defined need for several years for a given skill set, the City should be hiring staff internally, which would result in significant cost savings. Another significant drawback in extensive use of IT contractors for extended periods is that the intellectual value is lost when a contract employee leaves the organization.

4.5.2. Professional Service Agreements

Professional Service Agreements are fixed-term contracts that are either sole-sourced or tendered either by Materials Management Branch (public tender) or the Department (limited competition). Professional Service Agreements are established for specific services or contracts, which fall outside the Staff Augmentation contract. From January 2006 to April 2009 over 88 different vendors were used for approximately 192 different projects for a total value of $18.7 million. This equates to an average of approximately $5.6 million annually for IT related Professional Service Agreements. We observed that approximately half of these projects were sole-sourced or not tendered to the open market. We calculated the Professional Service Agreements equate to an estimated 29 full time positions.

4.5.3.   SAP Preferred Vendor

In 2007, SAP Preferred Agreements were established with three vendors to source specialty SAP skill set needs. From September 2007 to April 2009, three different vendors were used for a total value of $3.2 million. This equates to an average of approximately $1.9 million annually for IT related SAP Preferred Vendors. We calculated the SAP Preferred Vendors equate to an estimated 5 full time positions based on the weighted average hourly rates for each of the SAP Preferred Vendors.

Table 10 shows the hourly cost ranges for those vendors, which are considerably higher than internal costs and the costs of the staff augmentation contract. SAP preferred vendors' rates range from a low of $130 (SAP Developer) to a high of $445 (Project Director) per hour. The rates do not include travel and living expenses estimated at an additional 15% of the consultant's fee.

Table 10 – 2008 SAP Preferred Vendor Rates

Vendor	Low End $/hr	Mid Range $/hr	High End $/hr
A	231.00	320.00	445.00
B	160.00	180.00	190.00
C	130.00	167.00	185.00

Table 11 provides a summary of these contract resource types, annualized expenditures, and estimated full time equivalent positions. As shown the City uses the equivalent of 86 full time equivalent contractors on an annualized basis.

Table 11 – IT Contract Types

Contract Type	Annualized Expenditures ($ Millions)	Estimated (FTEs)
Staff Augmentation Contract *(2008 data only)*	$8.7	52
Professional Service Agreements *(Based on 2006-2009 data)*	$5.6	29
SAP Preferred Vendors *(Based on 2007-2009 data)*	$1.9	5
TOTAL	**$16.2**	**86**

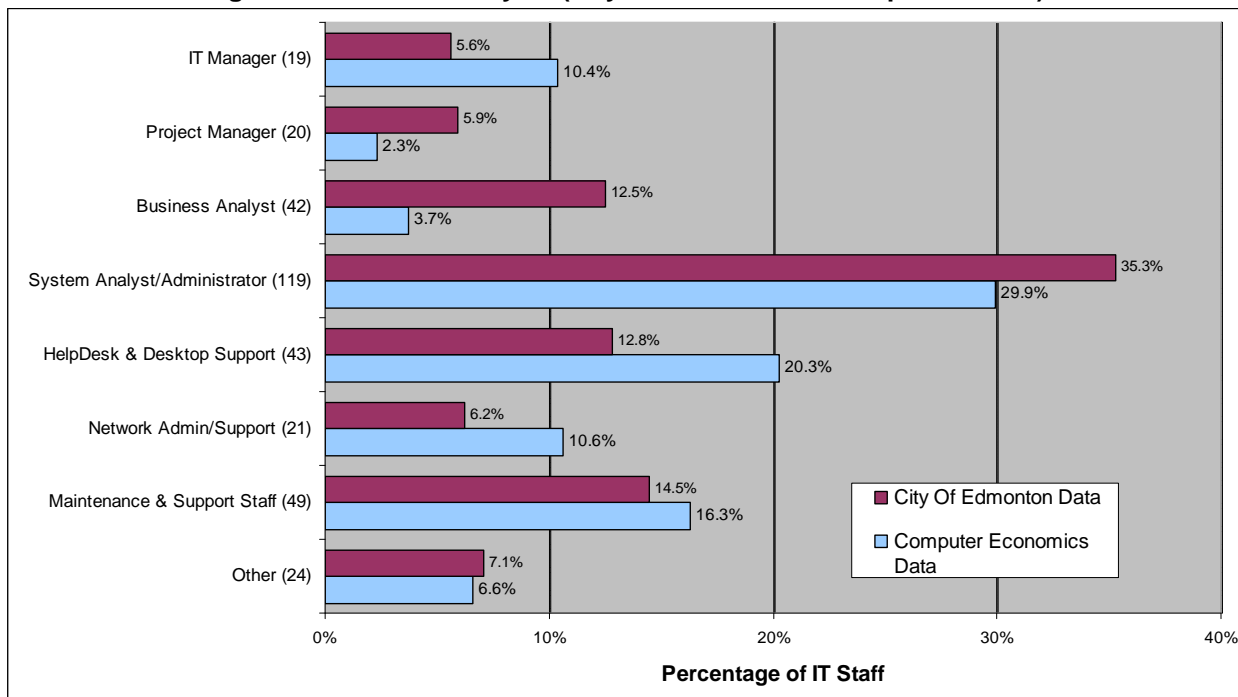| Recommendation 2	Management Response and Action Plan
The OCA recommends that the IT Branch Manager develop a resourcing strategy that addresses the following issues: • Required contract levels based on the ongoing-new initiative workload mix (see Recommendation 1) • Competitiveness of Staff Augmentation Agreement, Professional Service Agreements and SAP Preferred vendors • Conversion of extended IT contract positions to internal positions where cost advantageous	**Accepted** a) The IT Branch Manager in partnership with the IT Leadership team has been reviewing the resource strategy for the IT Branch since January 2009. It has been determined that the city relies too heavily on contract IT resources, which cost the city a financial premium over full time staff resources. As part of the outsourcing strategy the IT Branch Manager has already submitted, and has received approval to proceed with outsourcing of the Corporate Data Centre and the operation of Enterprise Applications. By outsourcing these functions the IT Branch will look to retrain as required and appropriate the full time staff to replace the contract resources. b) Each year the staff augmentation contract and it's pricing is reviewed with the vendors who were awarded the contract. The contract ends in 2011 and prior to that the city will issue an RFP to secure the services of contracted resources, if these types of resources are still required. The SAP preferred vendor contract has expired and the city currently has an open RFP to source new SAP staffing vendors. c) Conversion of contract resources to full time will be reviewed with the first priority for the branch to increase resourcing with full time staff who are being displaced by the outsourcing arrangement. **Planned Implementation:** December 31, 2009 **Responsible Party :** IT Branch Manager

4.6.   IT Labour Resource Levels

In 2008, the IT Branch staffing was at 303 FTEs. The IT Help Desk (Inside Information) had 34 FTE, for a combined corporate IT staffing level of 337. We previously presented our observation that the City's IT resources are skewed toward new initiatives versus providing ongoing support of existing systems. There are 203 FTEs (60%) providing ongoing support and 134 FTEs (40%) that conduct new initiative work.

4.6.1.   IT Staffing Mix

To further our analysis of labour resources, we identified and classified IT positions within the corporation. As shown in Figure 6, positions that are primarily responsible for new initiative work are high compared to the government benchmark. For example, the City's Project Manager level is 5.9% compared to the government benchmark level of 2.3%. In addition, the City has 12.5% of its IT staff identified as Business Analysts while the government benchmark is 3.7%. Furthermore, the City's System Analyst/ Administrator level is 35.3% compared to the government benchmark level of 29.9%.

The City's HelpDesk and Desktop support level at 12.8% is lower than the government benchmark of 20.3%. However, within the City, additional desktop functions such as replacements and repairs are outsourced.

Figure 6 - Position Analysis (City staff FTEs shown in parenthesis)

Overall, these results further support our observation that the City's internal resources are skewed towards new initiative work. We believe there is an opportunity to pause or slow down much of the City's new initiative work and review staffing levels based on the updated "ongoing-new initiative" mix.

Recommendation 3	Management Response and Action Plan
The OCA recommends that the IT Branch Manager review staffing levels based on the updated "ongoing-new initiative" mix as proposed in Recommendation 1.	**Accepted** **Comments:** See comments under Recommendation #1 **Planned Implementation:** December 31, 2009 **Responsible Party** : IT Branch Manager

4.7.   IT Governance

4.7.1.   Need for IT Governance

IT Governance consists of the leadership, organizational structures, and processes that ensure that an organization's information technology sustains and supports its strategies and objectives. This definition includes the decision-making framework, clarity of roles and responsibilities amongst key project participants, effective communications, management review, and executive oversight. Effective IT Governance is critical to ensuring that IT-related decisions support the City's objectives. Simply put, good IT Governance makes the City more successful by establishing coordinated mechanisms that link objectives to measurable goals.

4.7.2.   IT Governance Structure

As discussed earlier, the City's IT governance structure has evolved over the past seven years to the current model in which Senior Management Team and the CIO serve as the IT Governance Committee. The Business Council and Technical Council no longer exist, however other committees such as the Application Working Committees and Business Improvement Committees still exist.

We assessed the City's IT governance structure and found that there is no current Terms of Reference that defines the roles and responsibilities of its members or its relationship to the IT Branch. We believe that the City needs to develop such a document in order to strengthen its IT governance framework.

4.7.3.   Project Management Policy

The City Policy on project management (Policy A1424A) provides a corporate-wide, professionally-accepted framework for managing the scope, quality, time, cost, risk and human resources of corporate projects. Using this framework increases the probability of selecting optimal solutions and that they will be implemented at the "right" time and at the "right" cost. Part of this project management framework is Concept Phase planning, which identifies specific requirements such as identification of needs, detailed project plan, budget estimates, and input from stakeholders.

The *Project Management for Projects* policy stipulates that projects should not be submitted for capital budget consideration until completion of the project's Concept Phase.

We observed that in the majority of the projects that we reviewed, budgetary approval was obtained without completing the concept phase planning, contrary to the requirements of this policy.

4.7.4.   Business Case Analysis

During this audit, we conducted a business case analysis, which included selecting a sample of proposed and completed IT capital projects and reviewing the supporting business cases.

We found completed IT capital projects that were funded without a positive business case.[4] For example, the Project and Contract Management (PacMan) project expanded the City's ERP system and cost $7.7 million, but did not initially have a positive business case. Subsequent value case assessments improved the ranking and showed a 6.5 year payback.

We observed in some cases that business case cost information differs from the Capital Budget funding profiles approved by City Council. For example, business cases show lower anticipated costs than were actually put forward in the capital budget funding request. We recognize that early project cycle cost estimates are less accurate than estimates made closer to the time of acquisition. However, we believe that if costs change as the project moves forward, then the business case needs to be revisited and requests for funding amended. In the event that the original project definition changes substantially, a new business case should be submitted and reprioritized.

We observed that some IT capital projects that are currently approved for capital funding have no formal supporting business cases. For example, the Tax Assessment and Collection System (TACS) is a proposed IT Capital Investment project estimated to cost $8.5 million. We found that there is no justification, documentation, or analysis of information to support the approved Capital Budget profile for this project.

Overall, we also observed significant variation in how business cases are prepared, including identifying needs, conducting detailed project planning, and obtaining input from stakeholders, which are all requirements of the City's *Project Management for Projects* Policy.

4.7.5.   Prioritization of IT Capital Projects

Five-Year IT Capital Plan

Over each of the next five years, the City plans to spend over $20 million on IT capital projects. The City's total capital budget for information technology projects is currently estimated at $118.9 million for the period of 2009 – 2013 as shown in Table 12.

Table 12 - Corporate "Information Technology" Capital Budget Plan (Dollars in Millions)

Operational Area	Year						% Split
	2009	2010	2011	2012	2013	**Total**	
"IT Branch" Capital Projects	$8.7	$9.8	$8.7	$9.7	$9.7	**$46.6**	39%
"Departmental IT" Capital Projects	$15.1	$17.9	$17.8	$11.2	$10.3	**$72.3**	61%
Total IT Investment	**$23.8**	**$27.7**	**$26.5**	**$20.9**	**$20.0**	**$118.9**	100%

Of this total planned investment, approximately 39% is for IT projects under the direct ownership and stewardship of the Information Technology Branch. The remaining 61% is for projects that are not owned by the IT Branch; rather, these projects are the

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[4] Positive business cases provide assurance that the benefits obtained from a project outweigh its costs. Lower capital cost projects are more likely to lead to a positive business case than are higher cost projects.

responsibility of various operating units, in various departments, throughout the City. In 2009, the total approved IT capital investment in the City is $23.8 million of which 37% ($8.7 million) is controlled by the IT Branch and the remaining 63% ($15.1 million) is controlled by departmental business units.

Business Influence

Business units outside the direct control and influence of the IT Branch dominate IT capital spending in the City. We observed that the current governance decision-making framework does not facilitate consolidation of all IT capital investment requirements. This is necessary to ensure that the IT projects being considered for capital budget considerations are aligned with corporate strategic needs and that the projects reflect current corporate priorities. This lack of effective governance has resulted in "islands" of technology throughout the City, including numerous shrink-wrapped (off-the-shelf) systems and other systems that do not align with approved Corporate IT strategies and standards.

We believe the current IT capital budgeting requires a consolidated approach to prioritizing IT projects, resulting in better alignment of corporate goals. These corporate IT priorities should then be forwarded and considered as part of the City's overall Capital Planning and Priority setting exercise.

Recommendation 4	Management Response and Action Plan
The OCA recommends that the General Manager of Corporate Services develop an IT Governance Framework for the IT Governance Committee's approval to oversee all Corporate IT investments. This framework should include specific roles and responsibilities and must address: • Compliance with the City's *Project Management for Projects* Policy • Assurance of accurate and positive business cases to support each capital project's funding • Application of approved business criteria for IT projects • Prioritization of all IT capital projects • Submission of IT capital priorities to the Capital Priorities Planning Committee for coordination from a corporate perspective.	**Accepted** **Comments:** While an IT Governance Framework has been in place in the past, with the Corporate re-organization the framework needs to be realigned and the commitment to it renewed. **Planned Implementation:** An updated IT Governance Framework will be presented to the IT Governance Committee for their consideration and approval prior to the end of 2009. **Responsible Party:** General Manager, Corporate Services

5.   Conclusion

The City and those involved in the delivery of IT services face enormous challenges given the increasing demand both internally and externally for more services. Our two audit objectives were to assess the effectiveness and efficiency in the delivery of the City's IT services and the effectiveness of the IT Governance Framework in prioritizing and allocating the City's operating and capital resources for information technology.

We conclude that the Corporate IT resources can be used in a more cost effective and efficient manner.

We identified the Corporate IT costs and analyzed the use of resources throughout the City for IT programs. We reviewed the operating and capital financial data for corporate IT resources and have illustrated that the City's IT expenditures have increased in the last few years. The City is engaged heavily in new initiative work compared to providing on-going support, which we believe is building up the IT asset base, which will further increase IT resource demands. We compared the City's IT resources to government benchmarks and have shown that the City's overall expenditures on IT resources is higher. Our recommendations call for the IT Branch Manager to review the current mix between ongoing support and new initiative work. Once the desired mix is determined, staff and contract resource levels should be adjusted accordingly.

We conclude that the IT Governance Framework is not effective in prioritizing and allocating operating and capital resources for information technology.

We observed that the City's IT Governance framework has changed since it was implemented in 2002. Over that time, we believe that the City has made progress towards the strategic vision within the Corporate IT Strategic Plan. However, managers in the City believe that the City's information technology is currently underperforming.

We believe that the City's current IT governance framework structure does not facilitate effective decision-making as we have shown through our business case analysis. We observed that the City did not comply with its own *Project Management for Projects* Policy for some of the business cases we reviewed. We observed that business cases did not exist for IT projects where Capital Budget funding was already approved, while other IT capital projects did not have positive business cases. We found that budget estimates identified in business cases were lower than funds requested in the Capital Budget. Finally we observed that the demand for IT projects arises both from the IT Branch and from other City Departments. We believe that all IT projects should be prioritized through a single mechanism. We recommended that the Corporate Services General Manager develop an IT Governance Framework that will address these issues from a corporate perspective.

We acknowledge and thank City staff for their efforts and openness during this audit.

6. Appendix: Research Sources

Two primary sources of government benchmark data were used in this audit to assess the City of Edmonton's investment in the use of information technology. A third source (IT Governance Institute) was used to gain additional insight into IT governance. They include the following:

- Gartner Inc.
- Computer Economics Research Group, and
- IT Governance Institute

Gartner Inc.: Gartner is the world's leading information technology research and advisory company to over 60,000 clients in 10,000 distinct organizations. They work with the clients to research, analyze, and interpret the business of IT within the context of their individual role. Founded in 1979, Gartner is headquartered in Stamford, Connecticut, U.S.A., and has 4,000 associates, including 1,200 research analysts and consultants in 80 countries.

As part of this audit, the IT Branch Manager generously arranged for us to use his subscription to directly access the Gartner Web Portal, which allowed us to assess many of their research papers. We also had access to Gartner's Analysts to help us understand, with specificity and clarity, the exact interpretations of some of their key metrics. The OCA thanks the IT Branch Manager for making this possible.

Computer Economics Research Group: Founded in 1979, this research group provides metrics on IT management, and delivers advisory services regarding the strategic and financial management of information systems in North America and over 30 countries. The IT Spending, Staffing, and Technology Trends study, which we used within this audit, has been published annually since 1990 and serves as a definitive source of IT spending data, staffing benchmarks, technology trends, and related metrics across multiple industries and government sectors.

IT Governance Institute: We also relied on some of the research conducted by the IT Governance Institute. This research group is a non-profit, independent research entity that provided guidance for the global business community on issues relating to the governance of IT assets. This group helps executive and IT professionals to ensure that IT delivers value and its risk are mitigated through alignment with enterprise objectives.