



SUBJECT: 2022 Annual IT Audit Committee report.docx

TO: Audit Committee

FROM: Information Technology Services Department

Report Number: IT-03-22

Wards Affected: All

File Numbers: provide file number, if unsure or not known see uniform file plan

Date to Committee: June 8, 2022

Date to Council: June 21, 2022

Recommendation:

Receive and file information technology services department report IT-03-22 providing an annual information technology assurance update.

PURPOSE:

Vision to Focus Alignment:

- Increase economic prosperity and community responsive city growth
- Support sustainable infrastructure and a resilient environment
- Building more citizen engagement, community health and culture
- Deliver customer centric services with a focus on efficiency and technology transformation

Background and Discussion:

Annual IT assurance reports were presented to the Audit Committee starting in 2017 and were based on COBIT, a framework generally used in the governance and management of enterprise IT. Although the City has not formally adopted COBIT it is considered a useful reference point to guide the annual reporting process. COBIT was significantly updated in 2019. For consistency the updated COBIT model will be used and, as in previous reports, will include an update on the five-governance objectives also known as Evaluate, Direct and Monitor (EDM):

- Ensured Governance Framework Setting and Maintenance (EDM01)
- Ensured Benefits Delivery (EDM02)
- Ensured Risk Optimization (EDM03)
- Ensured Resource Optimization (EDM04)
- Ensured Stakeholder Engagement (EDM05)

In addition to COBIT, specific frameworks for respective areas of knowledge such as ITIL (Information Technology Information Library), PMI Project Management Framework and Centre for Information Security Critical Security Controls (CIS CSC) are utilized within IT as reference points.

This report provides a summary of the key controls in each focus area related to the objectives above and will highlight updates and improvements that have occurred since the last report.

The 2019 update report IT-02-19 (September 11, 2019 Audit Committee), 2018 update report IT-03-18 (June 14, 2018 Audit Committee) and the 2017 presentation A-01-17 (May 31 2017 Audit Committee) are available on the City's web site.

Office of the Chief Information Officer

Since the last report in 2019, the organization has experienced a global pandemic. Possibly no other area of operations has been more directly impacted and relied upon to continue operations than Information Technology. Plans for control improvements that were envisioned during the last reporting period quickly shifted in March 2020 to support the organization through this unprecedented period. This is not to suggest that progress on IT controls has not been made. On the contrary, many significant improvements have been made to accommodate the emerging pandemic needs of the organization.

As we transition from the pandemic to endemic, we will increase our focus on governance objectives to ensure we continue to meet the needs of the organization such as a hybrid workforce and supporting our digital government aspirations.

In the coming years, we will be focused on ensuring that IT decisions are made in line with the enterprise's strategies and objectives, ensure IT operations are more cost-efficient, manage the risk to the enterprise while continuing to deliver exceptional services, enhance and optimize the use of resources, improve stakeholder engagement, and increase transparency and long-term planning through roadmaps and communications that are both effective and timely.

IT Security & Risk Management

The purpose of the City's IT Security program is to maintain confidentiality, integrity, and availability of corporate information assets. Cyber-attack has been identified as the number one hazard facing the City as identified in the emergency management Hazard Identification and Risk Assessment (HIRA) report. Security and risk have become an integral part of IT service delivery and operations.

Corporate IT risk assessment processes have been baked into existing City and IT processes to ensure risks are identified and minimized to a manageable level. Security and privacy requirements are embedded in our system onboarding channels to ensure that systems and solutions are secured including our third-party service provider vendors. Threat and risk assessments, privacy impact assessments (Clerks) and cloud service provider reviews are conducted for all technology that the City stores or processes data. Assessments are outsourced to external security consultants for applications and on-line services that are hosted and public facing prior to going into production.

The City takes a defensive and in-depth approach to security by layering multiple controls to mitigate threats before they do harm. Threats are managed 24/7 by assessing vulnerabilities, detecting intrusions, and applying preventive safeguards. The City is engaging vendors and solutions that support a zero trust framework to take the risk out of staff's hands as much as possible so they can focus on their line of business. Multiple safeguards have been implemented to multilayer protection. These safeguards have been designed to operate from anywhere regardless of the location where staff conduct their business.

An Information Security Manager position reports to the Chief Information Officer. The position has oversight of enterprise IT service delivery and is responsible for the delivery of a comprehensive, proactive information security program. The City hired a Cyber Security Analyst in 2021 to support the growth and operation of the security program.

In 2019, the City committed to an information security framework (ISF) based on the Centre for Information Security Critical Security Controls (CIS CSC) and a 5 year roadmap to reach a desired capability maturity model index suitable for the City. Priority items include security infrastructure uplift, mandatory security awareness training to City staff, updating the City's Information Security Policies, developing a corporate incident response plan, securing the remote worker with endpoint protection and multifactor authentication.

The City has focused on Disaster Recovery Planning (DRP) as it pertains to the Business Continuity Planning for the organization, in particular services delivered by

Emergency Services. Backup and recovery techniques are continually evolving to be capable to deliver the Recovery Time Objective (RTOs) and Recovery Point Objectives (RPOs) required by the business in an always on digital age. Data recovery is tested regularly and the overall DRP plan tested annually to validate processes and technology function as expected.

The V2F Plan includes a new strategic goal to “Increase corporate resilience to cyber-security threats through effective and proactive IT security management practices” as part of Focus Area 5 “Delivery Customer Centric Services with a Focus on Efficiency and Technology Transformation”. A key performance indicator (KPI) has been incorporated in the plan with a target of “100% of City staff have successfully completed security awareness training” in 2020.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in IT Security & Risk Management.

Key Controls in Place	Areas of Focus	Changes/Improvements
<ul style="list-style-type: none">• Risk assessment process• Annual audit of IT general controls• Disaster recovery & business continuity• Security updates/patches• Management and monitoring practices• Auditable incident and event management• Identity and Access Management• DR as a Service	<ul style="list-style-type: none">• Securing a remote workforce• Multifactor Authentication and Privileged Identity Management• Security awareness training• Incident response plan• Security Governance	<ul style="list-style-type: none">• 5 Year roadmap completion• Cross walk CIS CSC controls to NIST Cyber Security Framework• V2F strategic goal and key performance indicators (KPI's)

Strategy & Governance

IT Strategy ensures the strategic value IT brings to the organization through the enablement of frontline and back office services as well as transformational initiatives align with organizational strategies and goals.

In 2016, an IT Strategy was developed with a 5-year plan to deliver on a vision of “Innovative City Services powered by tech savvy people, modernized technology and meaningful information”.

Key accomplishments of the 2016 IT Strategy included deploying Office 365, City Hall Wi-Fi, enhancing the mobile work force, and initiating projects such as ERP, EAMS, CRM, and BI.

IT Services will be developing a new City of Burlington Digital Strategy which will transform how we think about and implement technology by adopting user centric practices, utilization of AI, embedding privacy and security, increasing digital access and delivering on the promise of a data enabled enterprise.

During this reporting period, IT Services began to address the findings from the 2019 Cloud Computing Audit, which include updating the cloud computing policy and framework, creating a process for registering cloud applications and an application inventory list, creating a risk assessment methodology for classifying cloud services, and developing a cloud application support model.

The IT Service Business Plan provides an overview of the service and identifies emerging opportunities and risks. This document and the service performance measures are updated on an annual basis. The 2021 IT Service Business Plan is attached as Appendix A.

Key Controls in Place	Areas of Focus	Changes/Improvements
<ul style="list-style-type: none">• IT Governance• IT Service Business Plan	<ul style="list-style-type: none">• Enterprise System Optimization• Digital Services	<ul style="list-style-type: none">• Modernized technology

Project Portfolio Management

Project Portfolio Management (PPM) involves the selection, prioritization, and management of the portfolio of projects that are led by or include IT Services. Individual projects are prioritized based on key business drivers, stated business needs and risk to the organization. PPM ensures they are effectively managed from initiation through to establishing post-implementation operations.

IT Services has adopted and follows the project management and business analysis standards and terminology set within the Project Management Body of Knowledge (PMBOK) and the Business Analysis Body of Knowledge (BABOK).

In 2021, a new section was created on the internal website called “IT Projects”. This page offers tools and templates for project management. In addition the site provides IT project information and highlighting initiatives in the pipeline. Standardization increases consistency and transparency while reducing risks. The site includes:

- A Business Intelligence (BI) Dashboard with IT Project information including roadmap, statistics, strategic alignment, and budget information;
- An IT Project Management Framework that outlines how projects are managed in the department;

- A comprehensive list of documents and templates that can be used during the lifecycle of a project.

The Enterprise Resource Planning (ERP) program and the Enterprise Asset Management System (EAMS) project are 2 enterprise transformative initiatives led by IT Services in collaboration with other business areas, in addition to numerous departmental focused projects. All projects are subject to IT security, procurement and vendor management protocols as dictated by existing policies, standards, and industry best practices. Change Management is a large component of project implementation to ensure proper information is shared, training is provided, and understanding is developed as to impacts across the organization.

The IT Steering Committee provides oversight and recommendations for the City's annual IT capital project work plan. A project portfolio management tool is used to track, monitor and report on the progress of projects. IT Services is working with the City Manager's Office to establish a new enhanced enterprise portfolio management process.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in Project Portfolio Management.

Key Controls in Place	Areas of Focus	Changes/Improvements
<ul style="list-style-type: none">• Project submission and review• Project prioritization/alignment• Project monitoring• Transition to operations• Procurement by-law• Vendor contracts	<ul style="list-style-type: none">• Project tracking and reporting• Change management• Backlog Management• Security and Privacy Review• Procurement templates	<ul style="list-style-type: none">• Business case template• Project Management Framework• Project Artefacts• Corporate Projects Council Report Templates• BI Projects Dashboard• IT Projects Website• Decision Making Guidelines

IT Infrastructure & Operations

The IT Services department has adopted Information Technology Information Library (ITIL) as a framework for IT Service Management. The ITIL framework is a set of standard processes and practices to enable effective management of IT.

The establishment of a Change Advisory Board (CAB) is an essential component, consisting of ITS management and technical staff, that continues to meet on a weekly basis. All changes for the following week are discussed. Dependencies, risks, and

contingency plans are thoroughly considered before a change is approved to proceed. Changes planned for upcoming weeks are discussed but not approved until the week prior to the scheduled change. Each change request identifies any downtime anticipated and the stakeholders who are impacted. Emphasis is placed on effectively communicating any impacts to the public and internal staff. Where possible, changes are implemented outside of normal hours of operation to minimize impacts on business and City customers.

Management of IT assets through their life cycle is a key focus area. Focus on assets is required to ensure asset use delivers value, they remain operational (fit for purpose), they are accounted for and physically protected. Ensuring that assets that are critical to support service capability are reliable and available is key to maintaining our online and emergency services. Managing software licenses to ensure that the optimal number are acquired, retained and deployed in relation to required business usage, and the software installed is necessary to remain in compliance with license agreements.

Provision of timely and effective response to user requests and resolution of all types of incidents is a key objective of the department. Restoring normal service in an event of an incident; recording and fulfilling user requests; and recording, investigating, diagnosing, escalating and resolving incidents is critical to ensuring operations remain functional.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in IT Infrastructure & Operations.

Key Controls in Place	Areas of Focus	Changes / Improvements
<ul style="list-style-type: none">• Incident Management• Transition to operations process• Change advisory board (CAB)• After-hours support process• Major incident notification• Critical infrastructure monitoring• Service performance measures	<ul style="list-style-type: none">• Incident detection and response• Problem management• High availability architecture• Life cycle management• Asset management• Inventory management of Hybrid workforce	<ul style="list-style-type: none">• Enhanced monitoring tools implemented• Corporate software library• Staff allocation of equipment• Requests / incident triage process• Enhancements to service desk incident and request capture

Enterprise Architecture

The City has recognized the need for a holistic approach to how technology enables front and backoffice services for the City to better deliver IT solutions in an efficient and effective manner. Enterprise Architecture will add a strategic lens to the City's existing disciplined system, data, infrastructure, and security architectures. Benefits include reducing risk, redundant tasks, responding to the need for always on services, allow staff to be more agile and ultimately deliver high value services in an optimized way.

The City currently does not have role responsible for Enterprise Architecture, however a shared responsibility across senior staff of the various discipline areas exists. There is a recruitment plan in place to hire senior level resource accountable for Enterprise Architecture.

Financial Management

ITS provides the management of IT related products and services provided by a variety of vendors to meet enterprise requirements. This includes the management of vendor relationships, management of technology contracts, and reviewing and monitoring of vendor performance and the vendor ecosystem (including upstream supply chain) for effectiveness and compliance.

Management of the IT-related financial activities in both the business and IT functions, covering budget, cost and benefit management and prioritization of spending through the use of formal budgeting practices is critical to ensuring that the best value is being obtained for the corporation. Consulting stakeholders to identify and control the total costs and benefits within the context of the IT strategic plan is necessary. As part of managing our IT ecosystem, an asset management plan for information technology identifies the total value of IT assets, the annual cost to maintain those assets over their life cycle, and timeframes for significant upgrades and asset replacement has been updated.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in IT Financial Management.

Key Controls in Place	Areas of Focus	Changes / Improvements
<ul style="list-style-type: none">• IT Steering Committee capital budget management• Corporate / enterprise IT contract management	<ul style="list-style-type: none">• Life cycle management replacement costing• Consistency in contract clauses	<ul style="list-style-type: none">• Updated asset management plan (AMP)• Ongoing consolidation of technology costs

<ul style="list-style-type: none"> • Vendor contract renewal reviews 		
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Talent Management

Talent management has become a critical concern for management as the risk to our ability to provide services required today and in the future is threatened due to the “war for talent”. In North America, 32% of IT employees are actively seeking alternative jobs with 76% of new hires with at least 3 offers (2021 Gartner Global Labor Market Survey). To provide a structured approach to ensure optimal recruitment/acquisition, planning, evaluation and development of human resources (both internal and external) we:

- Acquire and maintain adequate and appropriate staffing;
- Identify key IT personnel;
- Maintain the skills and competencies of staff;
- Assess and recognize / reward employee job performance;
- Plan and track the usage of IT and business human resources;
- Manage contract staff.

Maintain the availability of relevant, current, validated and reliable knowledge and management information to support all process activities and to facilitate decision making related to the governance and management of enterprise IT. Plan for the identification, gathering, organizing, maintaining, use and retirement of knowledge.

- Identify and classify sources of information for governance and management of IT;
- Organize and contextualize information into knowledge;
- Use and share knowledge;
- Evaluate and update / retire information.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in IT People Management.

Key Controls in Place	Areas of Focus	Changes / Improvements
<ul style="list-style-type: none"> • Recruitment processes • Succession management for key corporate positions 	<ul style="list-style-type: none"> • Core skills requirements by position • Identification of resource single source of failure • Risk around attraction / retention planning 	<ul style="list-style-type: none"> • Workshops to identify key current and future skills / competencies required to support the changing ecosystem

Data & Analytics

Information is one of the most vital strategic assets that the City possesses and relies on to deliver services. This component encapsulates various disciplines: data strategy and governance, data quality management, data architecture, master data management, data integration, reporting, analytics and visualizations.

Building on the successes of the BI program, IT Services continues to expand on data integration initiatives, connecting applications to provide real-time information and reduce errors as well as duplication of effort. By identifying systems of record, we maintain data integrity and ensure the information is shared with downstream applications. This reduces the risk by protecting against inconsistencies that happen when data is created, handled and processed by many entities.

In 2020, the City received a consultant's report on Master Data Management. The report recommended focusing on data quality when implementing the new ERP and EAMS software. A new position, Data Management Lead, was created to assist these projects to develop and establish data management methodologies and processes that align with the data management roadmap.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in Data & Analytics.

Key Controls in Place	Areas of Focus	Changes/Improvements
<ul style="list-style-type: none">• Annual user access review• Monitoring/alerts• Information Governance committee	<ul style="list-style-type: none">• Standardized integration tools and methods• Data management standards and practices• Development of data strategy	<ul style="list-style-type: none">• Expansion of BI integration tool• Business Intelligence dashboards• Implementation of DR environment for enterprise databases.

Applications

This component encapsulates application lifecycle management and access management. The City operates a highly integrated and complex application environment that consists of over 209 individual applications.

The City assesses its application portfolio on a continuous basis to ensure applications are meeting our current and future business needs. This assessment informs our strategies to maintain, replace, upgrade or retire applications. To that end, the City is retiring many legacy applications with modern technology through the following enterprise projects: Enterprise Resource Planning (ERP), Enterprise Asset Management System (EAMS) and Tax Replacement. Moving to modern applications adds controls that assist with authorized access and reduces security exposures and compliance issues.

In addition to major projects, lifecycle management of our existing applications is an important part of staying current, secure, and meeting the City's strategic goals.

The following table summarizes the key controls, areas of focus, and recent changes that have occurred in Applications.

Key Controls in Place	Areas of Focus	Changes/Improvements
<ul style="list-style-type: none">• Annual user access review• Change control• Peer review• Monitoring/alerts• Cloud policy & framework• Application management procedures	<ul style="list-style-type: none">• Cloud policy review• Rationalization of applications• Lifecycle management	<ul style="list-style-type: none">• Major upgrades to existing applications include AMANDA, GIS, Banner, CAD (Computer Assisted Dispatch)• Updates/patches to minor applications

Strategy/process

N/A

Options Considered

N/A

Financial Matters:

Not applicable.

Total Financial Impact

Not applicable.

Source of Funding

Not applicable.

Other Resource Impacts

In order to meet the needs of the organization and ensure risks are mitigated as we embrace digital transformation, demographic shifts and growth of the City; a significant organizational design change is necessary which will include additional resourcing needs.

Climate Implications

The consumption of IT solutions results in carbon emissions (i.e. electricity consumption) and e-waste. Ensuring appropriate IT controls are in place as well as the efficient design of services (i.e. – consolidation) will reduce our impact on the climate.

Engagement Matters:

Not applicable.

Conclusion:

Receive and file information report IT-03-22 providing an annual information technology assurance update.

Respectfully submitted,

Chad Joseph MacDonald
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Appendices: (if none delete section)

A. 2022 IT Service Business Plan

Report Approval:

All reports are reviewed and/or approved by Department Director, the Chief Financial Officer and the Executive Director of Legal Services & Corporation Counsel.