

То:	Corporate Services Committee
From:	Tracy Adams, Commissioner, Corporate Services Department
Report Number:	CORP-20-17
Date of Report:	June 3, 2020
Date of Meeting:	June 8, 2020
Subject:	Corporate Information Technology Strategic Plan: 2020-2024
File:	A-1600

## 1.0 Purpose

The purpose of this report is to present the Corporate Information Technology Strategic Plan: 2020-2024 prepared by Perry Group Consulting Ltd. and that it be approved in principle.

Attachment 1 is the Corporate Information Technology Strategic Plan: 2020-2024.

Attachment 2 is the 2014 Baseline IT Assessment from Diverse Systems Group.

Attachment 3 is the 2017 Internal Audit – Information Technology Function Review from KPMG (Report CORP-17-34).

Attachment 4 is feedback received from the public.

Attachment 5 is the Corporate Information Technology Strategic Plan Findings and Future Directions.

## 2.0 Recommendation

That the Corporate Services Committee recommend to City Council:

- 1. That in accordance with Report CORP-20-17, dated June 3, 2020, the Corporate Information Technology Strategic Plan: 2020-2024, as outlined in Attachment 1, be approved in principle; and,
- 2. That the future operating and capital budget considerations as outlined in the detailed work plan be presented to Council when appropriate through future budget submissions as part of the City's regular budget planning process or separate reports as appropriate.

## 3.0 Executive Summary

Not applicable.

## 4.0 Input From Other Sources

Perry Group Consulting Inc. was retained by the City to develop the Corporate Information Technology Strategic Plan.

Members of Council, the Corporate Leadership Team, staff, external partners (e.g. the Robert McLaughlin Art Gallery, OPUC, Oshawa Senior Citizens Centres, Oshawa Public Libraries, Oshawa Executive Airport, OntarioTech University, Trent University Durham GTA) and members of the public provided input in the development of the Plan.

Municipal Benchmarking: Barrie, Burlington, Cambridge, Guelph, Kitchener, Newmarket, Oakville, Richmond Hill, Sudbury, Waterloo, Whitby.

## 5.0 Analysis

### 5.1 Background

In 2011, Council approved an Information Technology Strategic Plan (I.T.S.P.), Report FA-11-127, which outlined the key technology demand areas for the next three years, established a new governance model to support IT decision making reflective of corporate priorities, and plan for the Information Technology Services (I.T.S.) Branch to prepare itself to respond to today's and future demands of the City. Prior and Prior Associates Ltd. assisted in the development of the 2011 I.T.S.P. and a status of the Plan is included in Attachment 1, Appendix 4: 2011 Strategy Completion Checklist.

In 2014, Diverse Systems Group undertook a baseline assessment of the City's core IT systems and management practices with a focus on governance and portfolio lifecycle as well as general staffing observations, technology utilization and value (Attachment 2).

In 2017, KPMG completed an internal audit of the City's Information Technology Function as part of the 2017 internal audit plan. The results of the audit are outlined in Report CORP-17-34, Internal Audit - Information Technology Function Review (Attachment 3). The audit identified that the current I.T.S.P. is out-of-date representing a high risk to the Corporation and recommended that the City should develop a new I.T.S.P. including undertaking a detailed information technology strategic planning exercise to understand the requirements of the City's departments and evaluate how they can be met through investment in technology.

On October 16, 2017, Council approved FIN-17-80 Information Technology Strategic Plan, which directed staff to issue a Request for Proposal (R.F.P.) for the development of an updated Information Technology Strategic Plan in accordance with the Purchasing By-Law.

In February 2019, the R.F.P. was issued for the development of an updated Information Technology Strategic Plan. Eight proposals were received from qualified bidders. In May

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2019, Perry Group Consulting Ltd. was selected as the highest ranked bidder in accordance with the Purchasing By-Law. Perry Group Consulting Ltd. have significant industry experience developing technology strategies over the last 10 years. The Perry Group also participated in the development of the Council approved Information and Records Management (I&RM) Strategic Plan, Report CORP-19-101, dated December 4, 2019, through a partnership with Ergo Information Management Consulting.

Attachment 1 is the Corporate Information Technology Strategic Plan: 2020-2024 (C.I.T.S.P.).

#### 5.2 Review Process

Given the importance of technology and data to the City, the Strategic Plan was approached as a corporate initiative, not a specific I.T.S. Branch project. A current state assessment was conducted by the Perry Group, which involved assessments of current technologies and practices against municipal standards. An online survey with the public was also conducted to seek their input on current and future digital service needs. The results of the survey are included as Attachment 4.

In addition to consulting members of the public, the following provided input:

- Members of Council through one-on-one interviews;
- Corporate Leadership Team through one-on-one interviews and feedback on the Findings and Future Directions and Strategic Plan documents;
- Branch Directors through either one-on-one interviews and feedback on the Findings and Future Directions and Strategic Plan documents;
- I.T.S. Branch staff through meetings and feedback on the Findings and Future Directions and Strategic Plan documents;
- City staff through completion of a survey;
- Community stakeholders through interviews such as Oshawa Public Libraries, OPUC, Oshawa Executive Airport, Robert McLaughlin Art Gallery, Oshawa Senior Citizens Centres, Ontario Tech University, Trent University Durham GTA.

In addition, the Perry Group employed several assessment frameworks to evaluate the current state of the City's IT environment and to identify areas for future work. These include IT Service Management (ITSM) best practices such as the Information Technology Infrastructure Library (ITIL), IT Governance controls such as Control Objectives for IT (CobiT), the Municipal Technology Maturity Model (MTMM), and municipal benchmarks from comparator municipalities.

#### 5.3 Current State Assessment

Through the development of the C.I.T.S.P., the Perry Group sought to understand the current state of technology, technology capabilities, and the City's ability to meet customer expectations.

The Perry Group identified that there are a number of critical aspects that are limiting the City's ability to leverage technology effectively, which in turn impacts the City's effectiveness, efficiency, and its ability to implement leading customer service practices.

Attachment 5 is the Corporate Information Technology Strategic Plan Findings and Future Directions, which summarizes the current state assessment.

#### 5.4 Future State Assessment

IT research firm Forrester has identified three types of IT organizations, as outlined in the diagram below.



*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.

This model illustrates a progression in sophistication and capability of IT organizations based on the defined mandate and role of the IT group.

Currently, the City's I.T.S. Branch is resourced to operate at a Solid Utility level as their primary objective is to keep costs low and deliver reliable basic core IT services. However, they are trying to operate at all three levels.

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Based on feedback gathered during this process, the assessment by Diverse Systems Group and the KPMG IT Function Audit, the organization wants and expects the I.T.S. Branch to operate as a Partner Player. However, funding and resourcing have prevented the I.T.S. Branch from transitioning to this role as they are set up to operate not innovate.

It is critical that the future state of the I.T.S. Branch transition to Partner Player to meet the expectations of its customers and delivering exceptional customer service and digital experiences to residents, businesses and community stakeholders.

#### 5.5 Corporate Information Technology Strategic Plan: 2020-2024

The Strategic Plan comprises of five themes and 28 initiatives and provides opportunities to redefine the way the City delivers services including the transition from old, paper-based and duplicative business processes to enhanced customer service and improved staff productivity. The following areas are the key themes and areas of work that are recommended:

- 1. Digital Services for Residents and Businesses
  - a. Continued push toward digital services as the preferred channel
  - b. Expansion of the types of service requests that can be handled online
  - c. Digitization of City forms submit, apply, request
  - d. Expanded online payments
  - e. Expanded online bookings
  - f. Online permitting and licensing including building, business licensing, events and film permits
  - g. Online planning including submitting document and drawings online
- 2. Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions
  - a. Work Management Systems deployment (Maximo) and evolution (project underway)
  - b. Implementation of Asset Management and Decision Support solutions required to augment Maximo (e.g., Road Patrol, Pavement & Bridge management, Hydraulic and Traffic modelling solutions)
  - c. Land Management System (CityView) and evolution (project underway)
  - d. Digital plans management establishing shared corporate standards for handling digital plans (drawings) across all City departments

- e. PeopleSoft finance systems roadmap and enhancements (including Fixed Capital Assets, improved project and program-based project reporting)
- f. Tax system replacement
- g. Lagan upgrade (and integration with Maximo and CityView) (project underway)
- h. Human Capital Management system replacement (Employee Records, Payroll, Time, Attendance & Scheduling, Learning Management System)
- i. Officer system (Municipal Law Enforcement) enhancements
- j. Meeting management system
- 3. Mobile Tools for the Mobile Workforce
  - a. Mobile technology to support mobile projects in CityView and Maximo
  - 4. A Modern Workplace for a Modern Workforce
    - a. Expanded use of mobile technology and laptops
    - b. Office 365 implementation including modernized collaboration spaces, relaunch of Skype/Teams
    - c. Enterprise Content Management (and supporting document, records management practices, policies and procedures)
    - d. Improved meeting room technology to support virtual meetings
    - e. Telephone and telecommunications review, moving to increased softphone use and reduction of landlines
    - f. Increased adoption of flexible working (hours, locations, spaces)
  - 5. Becoming a Data Informed Organization
    - a. Auto-Vehicle Location (AVL) and Telematics solution
    - b. Corporate GIS and Data Strategy
    - c. Data warehouse
    - d. Reporting, analytics and dashboards implementation supporting KPI and performance management programs

#### 5.6 Annual Report and KPIs

To monitor the progress of the C.I.T.S.P., annual information reports including actions and key performance indicators will be provided to Council as outlined in Attachment 1, Section 9: Measuring Strategy Progress.

## 6.0 Financial Implications

The cost of the Corporate Information Technology Strategic Plan: 2020-2024 and Findings and Future Directions reports was \$100,000, which was approved by Council (FIN-17-80).

The Corporate Information Technology Strategic Plan: 2020-2024 identifies a number of improvement initiatives that will have potential capital and operating budget implications. The estimated budgetary impacts have been included in Attachment 1, Appendix 2: Detailed Workplan and will be presented when appropriate to Council for consideration through future budget submissions as part of the City's regular budget planning process or separate reports as appropriate.

It should be noted that the Plan was developed prior to the COVID-19 pandemic; therefore, the City will need to review the timing and financial implications of the Plan once the impact of the pandemic can be determined.

Additionally, the conceptual IT organization and recommended additional staff will be presented to Council for consideration once they have been evaluated against the needs of other departments and the City's ability to fund them.

## 7.0 Relationship to the Oshawa Strategic Plan

This report supports the strategic goal of Accountable Leadership.

Dave Mawby, Director, Information Technology Services

Lacy Adams

Tracy Adams, Commissioner, Corporate Services Department

Attachments



# Corporate Information Technology Strategic Plan: 2020 – 2024



## Final Report May 5, 2020

Perry Group Consulting<sup>Ltd.</sup>

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## **Executive Summary**

## **Introduction and Context**

In 2020, technology has become pervasive. During the Covid-19 pandemic, we see how essential technology has become to society's ability to connect and communicate, to shop for essentials and for those that can, to work remotely. Even before this event, for many, technology has become so ingrained in the way we live our lives and carry out our daily activities – how we bank, make a purchase, book an event, or renew our health card – that we wouldn't want to be without it.

And this is also how it is at the City, which is heavily dependent on technology to deliver services as diverse as collecting taxes, parking and bylaw enforcement, dispatching fire crews, handling customer inquiries, and managing recreation program registrations.

Imagine, for a moment, running the tax billing process without systems and bank payment options, or managing recreation program registration without the ability for customers to register online. In each case, the customer experience would be significantly poorer with long line-ups at customer service counters, limited service options with customers needing to go to a City facility during working hours to make a payment or register. What's more, each of these services would require more staff to process bills and bookings and to serve customers at the counter.

Good technology supports and enables great customer service, but it also supports the cost-effective delivery of City services.

Meanwhile, the City of Oshawa is changing. The City is rapidly emerging as a tech hub. CBRE recently rated Oshawa as one of the top cities for technology talent, with over 10,000 technology workers in the area. The City's educational establishments are innovating in the areas of Artificial Intelligence, in eSports and game development, in Augmented Reality (AR), and cyber-security research – bringing and growing ever-more tech talent in the area.

As people who are confident and who grew up with technology settle and raise families in the City, our customers increasingly expect to be able to interact with us in the same ways that they do with their bank, cable company or favourite store. Online, anytime, and from anywhere.

We are already seeing these changes in our frontline services. In a short period of time, digital channels have rapidly grown in importance. Today, Service Oshawa deals with as many digital inquiries (email and live chat) as they do counter inquiries.

In short, customer expectations of the services offered and the way they are offered have changed radically and traditional modes of interacting with the City – fill a form, join a line, come into City Hall – no longer meet the needs and expectations of many. As an organization, we need to be equipped to deliver services and experiences that match our customers' expectations.

## **Current State**

In this context, in developing this strategy we sought to understand the current state of technology, our technology capabilities and the City's ability to meet customer expectations.

While our assessments found some positives, it was identified that there are a number of critical aspects that are hampering the City's ability to leverage technology effectively, which in turn hinder the City's effectiveness, efficiency, and its ability to embrace leading customer service practices. The following findings were identified:

- Too many of the City's business processes are paper based, not digital.
- In many cases, the systems that manage important City business processes such as collecting taxes, scheduling and paying staff, assigning and tracking work, and processing permit applications – no longer meet the organization's requirements, are aging and must be replaced.

As a result, a number of extremely large and significant, resource-intensive and change-management-heavy initiatives such as Land Management and Work Management are underway. These projects, which have waited many years to move forward (since early 2010s), are significantly over-taxing the organization's capacity to deliver major projects and handle change.

In addition, existing Human Capital Management (HCM) systems no longer meet the needs of the organization and must be replaced – this is essential for the City to be able to more effectively manage its most important asset – *people* – and to reduce one of its most intensive administrative processes (payroll). Enhancements are also needed to the Finance system, to improve existing end-to-end processes and improve staff access to information to manage budgets.

- A number of other major projects, including replacing the aging Tax system, upgrading the Customer Relationship Management (CRM) tool and implementing an Enterprise Content Management (ECM) system (identified in the Information and Records Management (I&RM) Strategy) are also ahead.
- While many private sector and government organizations are using data to
  optimize operations and gain insights into policy and effectiveness, this area has
  been largely untapped at the City. Responsibility for this area is currently
  undefined, and work to drive activity in this area, beyond the Geographic
  Information System (GIS), is also largely undefined and completely underresourced. This represents a major opportunity for the future.
- The City has undoubtedly done some excellent work in the customer service space driven from Service Oshawa and Corporate Communications. The implementation of the CRM system is a leading practice. The website is modern and up-to-date and engagement platforms are in place.

The City is delivering some digital services – for instance, customers can book
recreation programs online, purchase pet licences, pay a parking ticket, or chat
with a customer service agent – however, the lack of digitized back office
processes inhibits the ability to move additional services online. Most forms on
the City's website are pdfs that must be downloaded and filled, and many
services require customers to visit City Hall to make a payment or submit
documents and paperwork.

So, the technology environment faces some important challenges in meeting customer and staff expectations. These findings echo the findings of the IT Functional Audit, completed in 2017 by KPMG. The IT management practices review tells us that:

- There is far greater demand than there is capacity for technology and business-technology projects at the City. As a result, there is a significant backlog of potential business improvement projects which often take many years to be realized. The City is unable to easily react to new opportunities because of the backlog.
- Existing IT governance processes are unable to effectively match or balance supply and demand; this is resulting in an overload of projects and creating a cycle of frustration at all levels. Corporate Leadership Team (CLT) and business leaders' engagement in and ownership of the technology-driven transformation portfolio needs to be improved.
- While the City appears willing to make significant, multi-million-dollar investments in major software projects (e.g., Intelligenz, Maximo, CityView), it is not making the required investments in staffing to ensure that the promise of these initiatives can be realized.

The IT Branch is resourced to operate, not innovate. Industry and municipal-peer benchmarks confirm that the IT Branch is under-resourced (the City has 30% fewer IT resources than reasonable comparators).

 Branches are looking for more help from the IT Branch in identifying how technology can help them be more effective and deliver better customer and staff experiences; but the IT Branch simply does not have the available resources to address these needs.

## **Strategic Themes**

Looking forward, the following areas are the key Corporate Information Technology Strategy themes, the areas of work that we recommend the City pursues.

- 1. Digital Services for Residents and Businesses
  - a. Continued push toward digital services as the preferred channel
  - b. Expansion of the types of service requests that can be handled online
  - c. Digitization of City forms submit, apply, request
  - d. Expanded online payments
  - e. Expanded online bookings

- f. Online permitting and licensing including building, business licensing, events and film permits
- g. Online planning including submitting document and drawings online
- 2. Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions
  - a. Work Management Systems (WMS) deployment (Maximo) and evolution (project underway)
  - b. Implementation of Asset Management and Decision Support solutions required to augment Maximo (e.g., Road Patrol, Pavement & Bridge management, Hydraulic and Traffic modelling solutions)
  - c. Land Management System (CityView) and CityView evolution (project underway)
  - d. Digital plans management establishing shared corporate standards for handling digital plans (drawings) across all City departments
  - e. PeopleSoft finance systems roadmap and enhancements (including Fixed Capital Assets, improved project and program-based project reporting)
  - f. Tax system replacement
  - g. CRM upgrade (and integration with Maximo and CityView) (project underway)
  - h. Human Capital Management system replacement (Employee Records, Payroll, Time, Attendance & Scheduling, Learning Management System)
  - i. Officer system (Municipal Law Enforcement) enhancements
  - j. Meeting management system
- 3. Mobile Tools for the Mobile Workforce
  - a. Mobile technology to support mobile projects in CityView and Maximo
- 4. A Modern Workplace for a Modern Workforce
  - a. Expanded use of mobile technology and laptops
  - b. Office 365 implementation including modernized collaboration spaces, relaunch of Skype/Teams
  - c. Enterprise Content Management (and supporting document, records management practices, policies and procedures)
  - d. Improved meeting room technology to support virtual meetings
  - e. Telephone and telecommunications review, moving to increased softphone use and reduction of landlines
  - f. Increased adoption of flexible working (hours, locations, spaces)
- 5. Becoming a Data Informed Organization
  - a. Auto-Vehicle Location (AVL) and Telematics solution
  - b. Corporate GIS and Data Strategy
  - c. Data warehouse
  - d. Reporting, analytics and dashboards implementation supporting KPI and performance management programs

Each of the themes and initiatives provide opportunities to redefine the way the City delivers services...to drive out old, paper-based and duplicative business processes and to reduce daily frustrations and make staff more productive.

## **Recommendations**

If the City truly wants to meet customers' expectations and be more efficient and effective and to deliver on this program of work, then it must significantly improve its capability to successfully manage the research, introduction and full utilization of new technologies and technology enabled services.

A significant change in approach to technology operations and project management, a new level of focus on a smaller number of initiatives, and increased investments in staffing are needed to achieve this.

Thus, implementation of these recommendations requires active engagement and leadership from CLT, support from Council, and active involvement of leaders and staff across the City. The IT Management team will also own and drive many improvements within the IT Branch.

The key recommendations regarding how the City approaches technology are that:

- 1. The City should establish a new integrated information and technology governance program, with CLT taking lead accountability for technology prioritization and investment and overseeing the delivery of the IT Strategy.
- 2. The CAO and CLT should establish, support and reinforce a clear mandate and role for the IT Branch, alongside holding business leaders and business units accountable for the delivery of service improvements powered by technology.
- 3. The City should commit to fully costing and budgeting for the total project implementation and operating costs of technology projects (the Total Cost of Ownership), including capitalizing technology project resourcing (for IT and business unit staff) by bundling project resourcing as part of capital projects, and ensuring that operating impacts of new solutions are budgeted through the annual budget process.
- The City should reallocate the existing Annual Technology Projects (ATP) fund to address immediate IT staffing needs, progressively investing in additional IT staffing to achieve a target of 4% IT staffing rate of total staffing by 2024 (30 FTE from 23 current FTEs).
- 5. The IT Director and Executive Director, HR should lead a reorganization of the IT Branch following recommended best practices outlined within this Strategy and the City's organizational design policy, working in collaboration with IT Branch members. The conception of a final structure for the IT Branch will be informed by staff input and engagement according to the organizational design process.
- The City should invest in Digital Education for its leaders (CLT, Directors, Council) and staff to help the organization become more tech savvy and better primed to take advantage of new and emerging digital opportunities.

7. The IT Director should report annually to Council on progress against the IT Strategy, at the mid-point between budgets.

## Conclusion

Investments in digital technology, *when done right*, can deliver tremendous efficiency gains and radically improved customer experiences.

When technology solutions are implemented poorly or not fully implemented, the detriments are easily discernible –frustration and reduced staff morale, often creating more inflexibility and leading to increased inefficiency, rather than the hoped-for improvements and efficiencies.

The City needs to be better positioned so that it can achieve the former outcome not the latter. Successive reviews and audits of the state of IT at the City have indicated an acute need for change. This Strategy is designed to bring about necessary changes and, in doing so, set the City up for success in delivering great digital customer and staff experiences.

## 1. Introduction and Background

## **1.1 The Importance of Technology to Municipalities**

Why is technology, and thus this Corporate Information Technology Strategic Plan, important to the City?

Even before Covid-19 and the execution of our technology enabled business continuity measures, the City was already heavily dependent upon technology. It is central to the City's ability to deliver services as diverse as collecting taxes, parking and bylaw enforcement, dispatching fire crews, handling customer inquiries, and managing recreation program registrations.

All of these services today rely on technology to operate effectively and efficiently – and, make no mistake, would be significantly more costly to deliver without technology.

Imagine, for a moment, running the tax billing process without systems and online payment options, or managing recreation program registration without the ability for customers to register online.

In each case, the customer experience would be significantly poorer with long line ups at customer service counters, limited service options with customers needing to come to a City facility during working hours to make a payment or register. What's more, each of these services would require more staff to process bills and bookings and to serve customers at the counter.

Good technology supports enables great customer service, but it also supports the costeffective delivery of City services.

Technology also plays a major role in efficiently connecting separate parts of the organization, customers, councillors, staff and partners (as illustrated in Figure 1) – whether across departments, or from customer service representative to road or parks crew.



Figure 1: Connecting People through Common Technology Systems

Using common, integrated systems ensures that inquiries flow from front counters to departments and to appropriate field staff for resolution in the quickest and most effective manner possible.

The introduction of Service Oshawa and the use of the Customer Relationship Management system to record, track and resolve customer inquiries and requests has freed many (including Councillors, management and staff) from these tasks, increased traceability and ensured that customer inquiries are resolved faster and more efficiently.

Despite the already important role of technology today for Oshawa, there are many opportunities to apply technology to inefficient paper-based processes that continue to dominate at the City.

Looking to the future, more City customers, and more than ever before, want to use their computers, phones and tablets to interact with the City – indeed, in 2019, Service Oshawa dealt with as many digital (email and live chat) inquiries as it did counter interactions. Going forward, we anticipate that this will continue to grow and evolve to include voice assistants and other technologies.

Increasingly, in the Smart City of today and the future, sensors and controls will be used to monitor critical infrastructure throughout the City, notify staff where problems are anticipated or have already occurred and be managed remotely or automatically respond to condition changes.

Leading municipalities are already using technologies and data to:

- Optimize and reduce the costs of snow-plow operations
- Coordinate capital construction and re-construction programs saving significant costs

- Share roadworks with Waze, routing customers around construction bottlenecks
- Issue building permits online
- Use AI to reduce the number of inspections required (focusing on high risk inspections)
- Reduce residential fires through demographic and location-targeted education programs
- Be transparent about City performance
- Create increased community cohesion and neighbourliness
- Reduce energy costs and monitor air quality

These are just a sampling of the types of capabilities that will allow the City to maximize its operational efficiency – and to do more with the same resources.

Thus, successfully managing the introduction and utilization of new technologies is a critical organizational capability that Oshawa must cultivate to be an effective, modern municipality.

## **1.2 The Importance of a Corporate Information Technology** Strategic Plan

Given the ever-increasing importance of technology and its central role in delivering municipal services, the Corporate Information Technology Strategic Plan is a crucial piece of work.

The City's previous IT Strategy, approved by Council in 2011, is outdated and no longer provides the guidance the City needs. KPMG's Audit of the IT Function in June 2017 identified the development of a new IT Strategy as a high priority action.

Thus, the development of this strategic plan is designed to help the City (ask, and) answer, important questions about its technology environment:

- Is the Information Technology environment properly managed, maintained, secured, and able to support the needs of the City?
- Is the IT service cost effective?
- What are the City's future business needs?
- Is the technology environment, our resources and management practices equipped to meet current and future business needs?
- Are business units equipped and in a state of readiness to drive forward business transformation?

Among the many opportunities that the City is bombarded with, the Strategy must help the City determine its priorities and identify the key initiatives and activities that will support the City's strategic goals and objectives.

## **1.3 Oshawa Strategic Plan Linkages**

The City of Oshawa's 2015-2019 Oshawa Strategic Plan (OSP), "Our Focus, Our Future", affirms an emphasis on balancing the "wants and needs to be visionary,

long-term thinkers and [a City that] makes fully informed decisions with all facets of society and future generations in mind"<sup>1</sup>.

We would suggest that being visionary and long-term has strong links to technology and data. Truly visionary government agencies have embedded the concepts of digital, smart and community data into their strategic planning work.

We would encourage the City, as it continues to work on its future iterations of the Corporate Strategic Plan, to embed digital goals and establish metrics to help define and realize success.

## **1.4 Developing this Strategy**

Given the importance of technology and data to the City, this Strategy was approached as an enterprise initiative, not an IT Branch project, from the outset. The project was sponsored by the Commissioner of Corporate Services and led by the Director of IT.

The Project was essentially developed in two phases:

**Discover and Strategize:** A current state assessment was conducted by the consulting team, which involved input from all staff via survey, assessments of current technologies and practices against municipal standards, workshops with all IT staff, as well as meetings with IT management. The team also met with representatives from all Branches, we met with external partners (e.g., the Library, OPUC) and with arms-length organizations that IT supports (e.g., Airport, Gallery, Seniors), members of CLT and the majority of Council members. We also conducted an online survey with the public to seek their input on future digital service needs.

The focus for this phase was not only to develop a "SWOT" (Strengths, Weaknesses, Opportunities, Threats) assessment of current conditions, but also to curate information that could help focus future efforts in response to corporate needs and objectives. At the conclusion of this phase, an interim Findings and Future Directions report was compiled and reviewed with CLT, IT Management Team, and IT staff.

**Plan:** The consulting team worked with the IT Director, CLT, and with IT Management and staff to develop a series of recommendations, an implementation plan and to prepare this final written Strategy.

Drafts of this document and the supporting materials were reviewed by the IT Management Team and IT staff, business units and CLT before being finalized.

## **1.5 Acknowledgements**

Perry Group would like to acknowledge the cooperation and support of Council, Management, City staff and stakeholders throughout the development of this Strategy.

<sup>&</sup>lt;sup>1</sup> City of Oshawa's 2015-2019 Strategic Plan (*https://www.oshawa.ca/city-hall/resources/OSP\_Access\_2015\_2019.pdf*)

## 2. Current State Assessment

Before developing any future looking strategy, it is important to take stock of the current situation. Where are we today? Does the current situation support future goals?

This section of the report presents a short summary of the consultant's assessment of the current state of the City's technology systems and the City's current approach to managing its technology. It echoes findings from previous IT Strategy work by Prior & Prior in 2011, by DSG in 2015, and the IT Function Audit conducted by KPMG in 2017.

It is provided here to establish the context for changes recommended later.

## 2.1 Technology Environment

Perry Group reviewed the City's technology against the Municipal Technology Maturity Model (MTMM). The MTMM, developed by Perry Group over the last decade of working with municipalities in Canada, identifies all of the technologies that a municipality such as Oshawa should have in place.

The MTMM diagram in Figure 2 uses a traffic light grading system to colour code the results of the review of the current technology environment.

The key messages that the assessment conveys are that:

• While the MTMM assessment indicates that the City's **Infrastructure layer** is largely in good shape (indicated by the green areas to the right of the diagram), the reds on the left indicate some key risks

These point to areas in which the intersection of IT and business units (through IT Governance) is creating some challenges

Going forward, particular focus is needed around IT policy, Business Continuity and Disaster Recovery requirements. The IT Branch must focus on improving its ITSM practices and procedures as well as a continued investment in building out an effective and sustainable Security program. This is critical due diligence work that must be resourced and tackled

• The assessment indicates that the **Business Solutions layer** is where the City faces the most work over the short- to medium-term

There are a number of orange and white boxes indicating systems replacements or systems gaps

A number of extremely large and significant, resource-intensive and change-management-heavy initiatives (such as Land Management and Work Management) are already underway – the impact of these initiatives cannot be over-stated



Figure 2: MTMM Results

Work in the Human Capital Management area will be essential for the City to be able to effectively manage its largest and most costly asset – people – and to reduce one of the most administratively intensive processes – payroll and scheduling

Pressing Tax systems replacement while Land Management System (LM) and WMS are also underway

Together, this glut of initiatives is already over-taxing the organization's capacity to deliver major projects and staff's capacity for handling change, and other major corporate-wide initiatives such as Enterprise Content Management are ahead

• The **Data and Integration** area has been largely untapped at this stage and thus represents a significant future opportunity

Opportunities abound to measure and monitor, understand and optimize service delivery using data that the City already collects and will collect in future. Responsibility for this area is currently undefined, and work to drive activity in this area, beyond the GIS, is also largely undefined and under-resourced

• The City has done some excellent, indeed, leading work in the **Customer Facing layer** and in delivering some digital services, creating a strong foundation for future expansion of digital services

It is interesting to note that this is founded on the basis of strong business ownership and accountability for service delivery from Service Oshawa and Corporate Communications, and are a result of working with a series of vendor partners (eSolutions, Bang The Table, Kana) that have considerable expertise in the domain

Out-tasking a number of the web platform functions comes at a cost but allows the City to move faster and be more flexible

This is a model (strong business ownership, flexible platforms) that should be replicated in other technology domains

## **2.2 Technology Management Practices**

A number of important technology management practices were identified as areas that could be significantly improved.

 CLT ownership of the business-driven, technology supported transformation portfolio, and individual business leaders' involvement projects should be improved
 Existing IT governance processes are not able to effectively match or balance

Existing IT governance processes are not able to effectively match or balance supply and demand. This is creating a vicious cycle of frustration at all levels, within the IT Branch, at CLT and within business units – this cycle must be broken

- There is greater demand then there is capacity for technology and business technology projects at the City an estimated 75% of IT Branch time is allocated to operational work, leaving just 25% of the resources (approximately 1500 days) available for project work. The IT Branch is setup to *operate* not *innovate*
- The City has undoubtedly demonstrated a willingness to invest in new technology (e.g., Maximo, CityView) but does not appear to invest in the necessary human capital to successfully and effectively implement and sustain these solutions, and thus fails to realize the full return on investment
- The IT Function Audit in 2017 identified that "ITS as a function is able to provide support for day-to-day operations and able to respond to requests or incidents that are raised but will benefit from more proactive actions to better meet the needs of the business users". Further, it noted that "Stakeholders reported receiving good service on operational requests but expected more proactive support, communication and advice from ITS"

Based upon its research, the IT Research firm Forrester has identified three types of Information Technology organizations, as outlined in the diagram below.

This model illustrates a progression in sophistication and capability of IT organizations based on the defined mandate and role of the IT group.



Figure 3: IT Archetypes

- For some organizations, the organization funds, resources and mandates IT to a somewhat limited role; to be a **Solid Utility** – with the primary objective for the group to keep unit costs low and deliver reliable basic core IT services. Other teams in the organization must take responsibility for projects and business transformation activity.
- In other organizations, the IT group is asked to provide the solid utility service and for them to use their experience and expertise to lead corporate and departmental solutions projects. In this mode, the IT Branch becomes a Trusted Supplier – trusted to execute on key corporate applications projects.
- Finally, other organizations see the IT Branch as a transformation engine. They look to the IT Branch to work with business leaders and business units to identify and implement business transformation projects as a **Partner Player**. IT is a true partner – working at the Executive table, actively contributing to major business transformation initiatives.
- The consultant's assessment indicates that expectations from leadership and business units, again in line with the findings of the IT Function Audit, are that the IT Branch should operate more as a Partner, but funding and resourcing levels for the IT Branch do not match this expectation level. Funding and resourcing for the IT Branch are closer to that of a Solid Utility. Again, IT is setup to operate, not innovate

• As noted in the 2017 IT Function Audit, and re-confirmed at this time, it is clear that Branches are looking for more help from the IT Branch in identifying how technology can help them be more effective



Figure 4: Mismatch of Expectation to Service Capability

- The current headcount of the IT Branch is 23 Full Time Equivalent (FTE), with one temporary FTE secondment to support the Maximo project. The headcount of the IT Branch in 2010 was 22 FTE
- Comparison with industry and municipal-peer benchmarks show that IT resourcing at Oshawa is below industry averages and below peers (see Appendix 5 for details). Burlington and Richmond Hill are considered good comparisons – with the IT Team at Oshawa operating with approximately 30% less staff than these two organizations
- The following roles which we would expect to find within comparative IT organizations are missing from the Oshawa IT Branch:
  - Client Services Manager
  - Project Manager(s)
  - Program Manager(s)
  - Business Analyst (note Business Analyst role titles exist but people in these roles fulfill a role that combines Business Analyst, Systems Analyst and Project Management functions)
  - o GIS Manager
  - Architect (Data / Solutions)
  - o Data Analyst
  - Vendor / Contract Management
- Key staff in senior and strategically important roles in the IT Branch are eligible and plan to retire in the very near term, some in the medium term. Succession plans are largely non-existent and, where they do exist, are insufficient
- In 2019, the IT capital budget was set at \$1,445,000, of a total Capital budget of \$62,448,000 – representing 2.3% of the City's total capital budget. In 2019, the City's IT Branch operating budget was \$5,513,667 of a total \$153,098,586 operating budget, representing approximately 3.6% of the City's operating

budget. Combined, the City spends approximately 2.9% of total budget on technology and technology services. Given the gaps identified and required investments, the City should expect to spend closer to 4%

- Again, it is worth reiterating that the City *is* investing in technologies Maximo, CityView, Lagan, and a new Tax system, as examples – but it is in the staffing area – the people – that are so critical to successfully implement new technology, in which the City is under-investing
- When evaluating against reasonable municipal comparators (lower tier, leading municipalities who are investing and leveraging technology, such as Burlington, Richmond Hill, Kitchener, Cambridge):
  - Oshawa has both the lowest outlay of capital as well as lowest operational investment in technology and technology services
  - Total staffing costs (salaries/wages) for the IT Branch (\$2.5M) are approximately half of that when compared to the highest (Kitchener, \$5.8M) and nearly 30% lower than the next lowest (Cambridge, \$3.6M) municipality
- Some key IT service gaps exist that should be addressed:
  - Formalized IT support outside of normal business hours is a requirement of many business units (Rec, Fire, etc.). The IT team currently provides this service based on the personal goodwill of management and staff, rather than a formalized model of support
  - Improved IT training is a strong requirement across the organization for both core IT capabilities (Office and other productivity solutions) and for business solutions
  - IT is insufficiently engaged with regard to important programs being led elsewhere in the organization (e.g., Smart City initiatives, TeachingCity and Innovation projects)
  - There is insufficient data to determine an optimized allocation of resources toward strategic projects and day-to-day work. Time tracking (through a modern and robust IT Service Management System (ITSM)) and regular review by the IT Management Team needs to occur
- Projects take too long to move into delivery mode, and large corporate projects take many years to justify and deliver – a number of projects identified in the 2011 IT strategy, are only now being implemented (e.g., Work Management) nearly 10 years later
- Effectiveness of project delivery must be improved, and projects need to be championed, led and resourced better to ensure achievement of agreed outcomes. Projects are proven to be far more successful when staff can be dedicated to the project – not working off the side of their desk. The City, compared to peers, is under-resourcing business-transformation projects. The practice of funding project staff and backfilling project resources for projects has only recently been experimented with and is not a standard practice

 The City has a tendency toward bundling major pieces of work together – creating very large, corporate-wide implementation projects – that take huge amounts of energy and assume a significant amount of risk. Embracing modern and agile approaches, breaking projects into smaller components, should be a priority for the City

### 2.3 Current State Summary

The current state assessment identifies a series of significant and urgent areas for improvement and should illustrate the imperative for change.

The current state assessment should also establish a clear and shared baseline for Council, CLT, management and staff throughout the organization to acknowledge and recognize the current state; to make decisions, commitments and plans to address the gaps and the key deficiencies identified; and to allow for progress and improvements to be measured.

## 3. Setting Strategic Directions

We have established the current context, and clearly the current state of technology indicates that there are some challenges that must be addressed and change that is needed.

So, what are the key technology strategic directions for the City? What should the City be focused on over the coming years?

As we have discussed, conditioned by their experiences with banks, their insurance companies, and retailers, customers expect experiences with their governments to be efficient, effective and digital.

*"There is no difference between digital service delivery and service delivery. Today, everything is digital."* Alex Benay, CIO, Canada, 2016 - 2019

Input from Council and the City's leadership indicates interest in opportunities to significantly improve customer experiences through the implementation of digital technologies. Management and staff across the City have voiced the need to digitize current manual, paper-based processes as well as modernize the tools they use daily. The City's workforce should be fully empowered by technology, providing them the ability to work remotely, use data to make better decisions and spend less time on administrative tasks that could be digitally automated.

At the core, this strategy is about delivering exceptional customer service and digital experiences for the City's customers, Council and staff.

## **3.1 Key Technology Themes and Major Initiatives**

The following areas represent the key technology strategy themes (areas of focus) that it is recommended the City pursues.

- 1. Digital Services for Residents and Businesses
- 2. Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions
- 3. Mobile Tools for the Mobile and Flexible Workforce
- 4. A Modern Workplace for a Modern Workforce
- 5. Becoming a Data Informed Organization

#### **3.1.1 Digital Services for Residents and Businesses**

Customer service is a priority for the City and its goal as a high-quality service provider should be to provide easy to use, simple services. In today's world, residents accustomed to banking and buying products and services online, also expect to be able to access government services from their smartphone or their tablet any time and from anywhere.

As we have already noted, the number of digital interactions that the City has with customers is growing rapidly. Today, Service Oshawa deals with as many live chat and email interactions (~29,700) annually as it does counter interactions.<sup>2</sup>

So, it is the City's vision, in response to clear signals, that customers should be able to do more with the City digitally.

They should be able to visit the City's website, login to their account and easily and quickly:

- **Report a problem** and track its resolution (receiving updates along the way)
- **Make a booking** (e.g., recreation programs, facilities and rooms, inspections, events)
- Make a purchase (e.g., parking exemption, garbage tag)
- Make payments and manage accounts (e.g., pay an invoice, pay a ticket, set up a direct deposit, review a tax account, request a tax certificate)
- **Submit applications & supporting materials** and track the application or renewal progress (e.g., Development Applications, Permits, Business Licences, etc.)
- **Submit digital forms** that remember information that has been previously provided (a customer's address) and validates information before submission to reduce errors (e.g., grants, delegations, etc.)

As noted earlier, some of these services are available today, and the City commits to enhancing and expanding these service offerings. We expect that, increasingly, the community will use digital services as the best and preferred way to interact with the City.

This doesn't take away from the important role of Service Oshawa and the face-to-face, telephone, email and online chat-based services that it offers. The City is committed to continuing to offer choices to customers to interact using their channel of choice.

However, the expansion in digital services reflects the trends we see in customer interaction patterns with us and the fact that there are many in the City (92% of Canadians have access to the Internet at home and 76% have a smartphone) who simply prefer to interact with us digitally using the smartphone or the web.

#### What can a Digital Plan and Build Process Look Like?

Let's imagine how a Digital service for Planning and Building would work.

Kevin is building a new home on a lot in the City. He visits the City's website to review what is required before he starts. An easy-to-use wizard steps him through the process and he realizes he needs a minor variance before he can begin the build.

Kevin starts a minor variance application online (by completing an online form which validates the data he enters) to supply the City with the required information. He

<sup>&</sup>lt;sup>2</sup> Telephone interactions still eclipse other channels: with 159,800 calls, 21,500 emails, 8,200 live chat sessions, 29,700 counter interactions in 2019.

attaches drawings of his proposal from his architect and pays for the application with his credit card.

City Planning staff receive notification of the application, they validate that the correct details have been provided and start a series of workflows that allocates tasks to City staff required to review the application.

Details of the application are automatically published on the City's website and those that subscribe are notified of its receipt.

Kevin is emailed a copy of a sign that must be printed and shown onsite. The sign has simple details of the application and a QR code that allows anyone passing by, the ability to scan the code and be directed to the City's website to get more details about the proposed application.

A few days later, Kevin uses his smartphone to check in on his application and sees that it is due to be discussed at the next Committee of Adjustment (COA) meeting. He wants to be there, so he adds it to his calendar on his phone.

The COA approves Kevin's application and he is good to go.

Next, Kevin needs a building permit for his new build.

He logs back into his City account on the website and initiates a building permit application – using the information that he previously submitted for his minor variance application. He adds additional drawings and required information to complete the permit application, and again, pays for and submits his application.

This time, Building staff are notified of the permit application and they begin the process of its review. They use the same system as the Planning team so they can easily review the details of the minor variance request.

Once all reviews and tasks are completed satisfactorily, the City issues the building permit, emailing a permit to be printed by Kevin and posted onsite (also equipped with a QR code).

A month goes by and Kevin's contractor is now onsite and has completed the footings work. They require an inspection of this work before they can proceed. The contractor uses his smartphone to login to the City's website and book the next available inspection.

Stephanie, the building inspector for that area, is notified of a new inspection for the next day. The following day she heads to the site and conducts the inspection. She uses her connected tablet to review the details of the application and record the results of the inspection, completing a checklist of tasks, taking photos and making notes. At the completion of the inspection, she marks the inspection as completed, with a pass. The system automatically emails Kevin and his contractor the results of the inspection and work on site can proceed.

Although this presents a stylized and simplified example, this is the actual way that Planning and Building services in some municipalities across Canada and in many municipalities across the world work. This is the vision for the way services at the City could and should work.

### 3.1.2 Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions

Before the City can deliver truly great end-to-end digital services as illustrated in the Digital Planning and Building example above, back office processes must be digitized so that staff manage internal workflows and approvals digitally (not in localized and inaccessible paper files and folders).

The City is currently working to develop these capabilities through their work on the Work and Asset Management (Maximo) and OLI replacement (CityView) projects.

#### What do we mean by Digitized Processes?

Well-designed, standardized and digitized processes are the foundation of a well-run municipality. Business Solutions enable the operation of these digitized processes.

A process is a series of steps taken in order to achieve a particular goal or objective. Processes codify the way that the City handles transactions like permits, requests, complaints, license applications, the issuance of bills and tax payments. Defined processes ensure that each request is handled the same way.

Ideally, processes are designed to be efficient and to take advantage of modern capabilities. Technology-based business solutions enable processes to be digitized and automated which enable staff and management to coordinate processes at scale (e.g., recreation programs, permit applications, etc.).

When processes are digitized into robust business solutions, all necessary transaction processing can be carried out digitally and can occur anywhere. Offline steps (manual interventions such as checking a paper file or getting a physical signature) are largely reduced to the point of elimination.

Business solutions are shared across departments and branches so that tasks initiated or completed in one area can automatically trigger a task in another, such as a change in a permit status (in Building) that could trigger the processing of a pre-approved payment (in Finance). In such a situation, payments can be processed faster which ultimately can improve City cash flows.

The digital process chain provides complete visibility of the process throughout the City. Authorized staff can easily check on the status, review previous actions or locate required information without needing to search for a paper file. Systems manage the routing and workflow of processes, including escalating items to senior staff and management when exceptions are encountered or where performance falls below defined levels of service.

Digitization allows management to track team and workgroup processes and monitor Key Performance Indicators that provide insights to improve process effectiveness, or to support more effective allocation of City resources. Today, still too many of the City's processes are run using paper and pen or Excel spreadsheets – and not in digitized systems (timesheets are filled on paper, permit applications come in to City Hall in paper format, other licences and permits for filming or patios require applicants to download a form from the website, and then fill in the details and bring the form into City Hall).

Two of the City's major business solutions (Work Management and Land Management) are in the process of being replaced. But the City must recognize that in each case the initial project is the start of a journey. Full realization of the benefits of WMS and Land Management systems can and do take many years to be achieved – and multiple iterations and follow on phases of work. This is because the changes targeted involve people and process changes, as well as technology. Once the WMS has been implemented a constellation of other needs around Asset Management and decision support will also need to be addressed, such as Roads and Bridge asset planning systems, water systems modelling solutions, and long-term asset decision support solutions that help the City assess asset treatment and investment options.

Significant enhancements have been identified as broad corporate needs around HR process management, and a similar roadmap around Finance Systems enhancements is required. A number of aging systems must be replaced or upgraded – such as the City's Tax Management system and the City's CRM system. Other systems gaps include ECM, Meeting Management, AVL, Learning Management, enhancements to parking and enforcement solutions.

#### 3.1.3 Mobile Tools for the Mobile Workforce

Just as a FedEx<sup>®</sup> or UPS<sup>®</sup> driver uses a mobile device to track delivery of a parcel and obtain a signature, City staff who work out of the office should have access to similar technologies to collect data, track work orders, complete inspections, access asset history, check on case files, view drawings and conduct surveys.

Mobile will be central to the realization of the full benefits of Maximo, CityView and Officer products and using mobile technologies (including connectivity and security, devices, and business solutions) to access City information while on the go will be key for hundreds of staff – from Economic Development and MLE, to Roads and Parks staff.

The deployment of these technologies will allow a customer request (about a downed sign, for instance) to be directed to a field crew and progress to completion to be tracked by back and front office staff. This not only speeds up complaints resolution but also maximizes the ability to manage the deployment of resources in the field.

#### Mobile Increases Customer Responsiveness and Satisfaction

A stop sign has been knocked over. A passing customer takes a photo of the downed sign and sends a request to the City for a repair. The notification is received, automatically categorized, geo-located and recorded in the City's customer request management system and dispatched to the City's work management system (Maximo) for resolution. The work management system automatically dispatches a request to the nearest crew in the area who receive it on a laptop in their work vehicle. As an emergency work order, they head to the site and erect a temporary stop sign. A couple of days later, the sign crew visits the site and replaces the stop sign. They take a picture of the fixed sign and the customer receives a notification on his/her smartphone that the issue has been resolved.

#### 3.1.4 A Modern Workplace for a Modern Workforce

If the City is to be a more modern and digitally organized, then it must also make available simple and easy collaboration capabilities for staff – enabling staff to do their best work by using the tools best suited to the job. They should be able to work from anywhere at any time and those experiences should be simple, easy and embrace the notion of self-service. The following are opportunities to modernize an approach to the way people produce, access and disseminate information across the organization:

- Increased use of mobile-friendly devices laptops, tablets providing individuals and teams with choices of devices that best meet their needs
- Digital meetings real time meeting notes, improved and broader adoption of web meetings, screen sharing
- Team messaging and chat helping co-workers connect and interact in real time
- Shared project collaboration spaces helping internal teams work together, track projects, assign tasks, share documents, and also enable improved collaboration with partners, vendors, and the community
- Improved document collaboration, versioning, co-editing
- Large file transfer and sharing
- Easier presentations in City meeting and board rooms with standardized technology in each
- Increased adoption of remote and flexible working enabling staff to work from the office, from a partner's office space, from the side of the road, from a coffee shop or from home

Importantly, the City's culture must embrace these technologies and the workforce must be trained and comfortable using the technologies – making it commonplace to take advantage of them.

#### Modern Flexible, Real Time Collaboration

Julie, a City staff member in Economic Development, is working on an opportunity to attract a high-tech firm into the downtown area. She's working from home on her laptop and needs to get her team together quickly to discuss and finalize the proposal. She checks the availability of teammates, and seeing they are available, quickly sets up a video conference from her cellphone and jumps on the call with Adil and Jim. As they discuss the opportunity, Julie takes some digital notes and assigns tasks to various other team members who aren't present and then they jump into a templated proposal letter that they edit together. Julie sends a chat message to her boss, Kent, to let him know where they are at in the process. Kent jumps on the video call to ask a few questions to clarify the proposal before it is shared more broadly. Julie collects and collates various supporting materials for the proposal and then shares the workspace with team members at OPUC and Durham Region who they are collaborating with on the proposal and from whom they need some input.

Later that afternoon, Julie, now in a meeting with the firm's CEO, receives an alert on her phone that the proposal document has been finalized by Durham Region and is ready to share with the client – she immediately shares a read-only link with the CEO to the proposal.

#### **3.1.5 Becoming Data Informed and Data Driven**

As highlighted in the City's previously approved Information and Records Management Strategy (I&RM Strategy), data and the effective use of data and analytics to identify trends, management insights and optimizations has huge potential for the City.

Today, information that the City holds in key systems (Manta, Lagan, PeopleSoft, Officer, OLI, GIS) is difficult to access and combine in a timely (near-real time) manner. Those who manage large and long running capital projects find it challenging, for instance, to monitor project budgets against actual expenditures, typically resorting to maintaining their own tracking systems in Excel or Microsoft Access.

As the City increasingly digitizes its processes and uses business solutions to manage its workflows and work assignments, it will collect more data about the services it provides, the way staff work and the impact of policy decisions.

Thus, Council and the City's leadership, management and staff will be able to use data to make decisions that help optimize resource use, reduce administrative complexity and reduce service delivery costs.

In Edmonton, for example, the City has analyzed over 10 years of inspections records and developed an algorithm that prioritizes high risk inspections and "automatically passes inspections for builders with a good track record and for those inspections posing limited risk to public safety". This has resulted in a 37% decrease in eligible inspections.<sup>3</sup>

<sup>&</sup>lt;sup>3</sup> https://govlaunch.com/stories/edmonton-leveraging-ai-to-make-safety-code-inspections-more-efficient

This Corporate Information Technology Strategy fully supports and builds upon the I&RM Strategy. Moving forward the City should plan to:

- Implement the recommendations of the I&RM Strategy (combined information and data governance, investment in GIS and data programs, leadership of the GIS and data programs)
- Use data from the City's CRM to demonstrate the potential of data analytics and visualization
- Establish a data strategy and evolve data best practices at the City through IT Governance Committee (ITGC)
- Establish master and authority sources of data that all at the City and in the community can rely upon
- Use data and analytics to inform decision-making and to help optimize the application and use of resources
- Embed GIS / spatial understanding into more of the City processes
- Use dashboards and performance measures to monitor and communicate performance internally and to the community

#### Using Data to Optimize for Community Benefit

City Fire officials in London were determined to reduce residential fires in the City. They turned for help to data collected over the years on residential fires. Spatial analysis identified a number of hot spots in the City with a higher propensity for residential fires. The combination of this insight with data about the type, severity and cause of fires as well as other demographic and socio-economic data, allowed Fire officials to identify important characteristics of fires in these hot spots. This information helps Fire target its resources more effectively – with concentrated communications and advertising, fire prevention education and inspections – the City achieves a 10% reduction in residential fires, significantly reducing loss of life and property in the City.

By pursuing these strategic directions, the City can become more effective at what it does, and more efficient in how it manages work. Modernizing workforce tools and enabling digital collaboration will help support and engage staff in their work as well as reduce the amount of time it takes to perform administrative tasks. Similarly, providing customers with a growing number of digital services will ultimately increase adoption rates and decrease the need for the City to support more resource intensive customer service channels.

The use of digital transformation to modernize municipal services is growing rapidly (because of the results that are being seen) and the City should be a part of this movement. By providing good quality, digital tools and services for customers, Council and staff, the City can expect to save time and money as well as produce great experiences for the people that matter most.
# **3.2 Current to Future State Transformation**

The following table highlights at a high level the anticipated transformation that the implementation of this Strategy would bring.

Current State	Future State	Value
Too many of the City's services require customers to travel to a City facility during working hours to conduct the transaction.	Customers can conduct the majority of business with the city digitally at their convenience, anywhere any time.	<ul> <li>Increased customer satisfaction</li> <li>Reduced travel (time, cost, CO<sup>2</sup>)</li> <li>Reduced service delivery costs to City</li> </ul>
Too many of the City's business processes rely on paper and the maintenance of paper-based files. Excel tracks important tasks, activities and inspections. Data is entered into systems multiple times. Accessing a complete view of information is challenging because of a mixture of systems and offline processing.	All of the City's core business processes are managed digitally as part of streamlined, customer-centred workflows.	<ul> <li>Increased process efficiency and reduced redundant effort</li> <li>Reduced paper use and storage costs</li> <li>Processes can be managed from anywhere</li> <li>Real time performance management</li> <li>Foundation for increased process automation</li> </ul>
Field staff rely on paperwork orders and timecards to track work and time and must return to the office frequently to access information.	Field staff (inspectors, crews) use mobile technology to stay connected, record work, resolve customer problems and inquiries, access drawings and records stored in office systems.	<ul> <li>Increased speed of resolution of complaints with real-time work allocation</li> <li>Increased staff productivity leading to increased number of work order completions</li> <li>Reduced travel waste</li> </ul>
Staff are somewhat restricted by the technology that they have access to; meetings are mostly in person; collaboration is largely via email.	Staff can work flexibly and remotely and digitally – digital meetings and technology make collaboration simpler and easier.	<ul> <li>Increased staff productivity</li> <li>Increased ability to collaborate internally and externally</li> <li>Fewer barriers and less friction = less stress for staff</li> </ul>

Current State	Future State	Value
		<ul> <li>Good for employee recruitment and retention</li> </ul>
Decisions are often made without the detailed, real-time up-to-date information that would make decision-making simpler.	Data and analytics are used by management and staff to optimize performance in real-time and to anticipate, scenario-plan and predict.	<ul> <li>Workforce productivity can be optimized</li> <li>Insights inform operational and strategic decision-making</li> <li>Policy effectiveness can be assessed</li> </ul>

# 4. Major Technology Projects

So, what are the major technology projects that must be tackled to achieve the vision of success? A summary workplan in Section 8 and a detailed workplan in Appendix 2 maps out the recommended sequencing and suggested timing of these initiatives.

# 4.1 Customer Facing Services

The explosion of digital services underpins a trend toward leveraging the web to provide more efficient and cost-effective service delivery for customers. The City needs to strategically plan for further adoption of digital services to ensure the highest needs are met, both in terms of the services provided but also in support of redirecting customer service channels in support of more complex interactions/transactions.

To do so, the City should work through IT governance to assess the value of current digital service offerings and determine a roadmap for future deployment of other offerings. The roadmap should be reviewed annually with results presented to ITGC. IT will also need to manage the lifecycle of service offerings to ensure the associated applications are updated and patched to keep within maintenance and support windows.

The following section provides several recommended projects in this area:

- **Online Building Permits:** To allow for the submission and approval of digital building permits. Currently planned as part of the CityView project
- **Digital Drawing Markup:** To allow the ability of users to annotate and "markup" digital engineering drawings and plans. Currently planned as part of CityView project
- **Online Business Licences:** To allow for the submission and approval of digital business licenses. Currently planned as part of CityView project
- **Online Planning:** To allow for the submission of digital planning applications (including drawing handling). Currently planned as part of CityView implementation.
- **Open Data Expansion:** In concert with the renewal of the Open Data program, continue to expand the data offerings and consider the inclusion of a broader range of additional non-geospatial data to better define the data catalogue as a "one stop shop" for both civic data and information
- **eForms Program:** Continue to work through the conversion of hard copy forms to create eForms that can be completed by customers remotely. The current "Forms Committee" should be used as a basis to create a Web and Digital Steering Committee. This Committee should be responsible for managing an annual workplan to identify and convert forms that are most frequently used (and can support a fully remote process)

In support of soliciting customer input regarding customer facing services, the City undertook a 17-day public consultation process. The focus was on engaging community members in relation to their use of Connect Oshawa, the City's online engagement platform which also hosted the online feedback form (paper copies of the survey were also made available). Respondents were also asked to rate several prospective new digital service offerings. In the end, the City engaged 24 customers who provided a range of responses on Oshawa's digital services. Prospective new online services were rated by respondents – those which ranked most highly are below (in priority order):

- Proclamation Requests
- Computer Kiosks at City Facilities (public access to City website/services)
- FOI requests
- Road-related, filming and event permits
- Tax certificate (ability to download)
- City facility rental
- Delegation requests to Committee/Council
- Business licensing
- Minor planning applications and building permits
- More data via the Open Data portal

Lastly, the City should continue to engage customers about digital services to ensure that expansion and improvements align with their most predominant needs. These engagement opportunities can be conducted broadly through Connect Oshawa but can also be targeted specifically to sectors within the community. Building better relationships with the local tech sector and business community in relationship to the online services they consume is an ideal way to support future growth and adoption. The City should also consider this to be an area that is very well suited for collaboration through the TeachingCity partnership.

## 4.2 Data and Integration

The I&RM Assessment Report and Strategy revealed that much work remains to be done to improve the management of the City's structured data. Managing data across a broad range of systems is proving to be challenging for the City, especially in the absence of clearly defined standards, roles, and processes. If data is not managed properly, the overall utility of these systems and the information they create becomes less effective. The growing reliance on technology solutions and the prospect of rethinking how an organization uses technology, people, and process to fundamentally change business performance (i.e., digital transformation) has highlighted data management (or master data management) as a key capability for all organizations in the 21st century.

Although IT is a key player, data is not specifically an IT issue. Section 7 of the I&RM Assessment Report and Strategy provides for a detailed list of recommendations the organization as a whole should consider if wanting to move forward to substantiate a data management program (and discipline) for the City. The Capability Maturity Model Institute's (CMMI) DMM (Data Maturity Model) framework was used to evaluate the

state of structured data within the City and recommendations were put forward in response to the 5 categories illustrated below in Figure 5.



Figure 5 CMMI DMM Framework

As noted in the I&RM report; "The City would rank low (level 0-1) in terms of an overall maturity according to the DMM because most of the City's data management practices are undocumented, informal and reactive".

For the purposes of this report, we have extracted some of the information contained within the I&RM Strategy and made recommendations from an "IT lens".

#### 4.2.1 GIS

The City has used the ESRI ArcGIS platform for decades to deliver GIS products and services to staff and the community. Although there are some resources dedicated to the program, some are decentralized (outside of IT) and largely work without an active leadership focus to continue to evolve the program and fully leverage its overall usefulness. There are many good examples of the usefulness of GIS at the City (e.g., open data portal, web mapping, collector field app, Emergency Operations Centre (EOC) dashboard, etc.). They are typically one-off projects launched in response to a need that arises from the business.

To maximize the potential GIS can offer to the City, a GIS Strategy should be developed and managed to consider the organization as a whole and identify products or services that can be leveraged by multiple areas within the City and determine which have the greatest impact to customers and community partners. The Strategy should be supported with an annual workplan in which ITGC can make decisions to ensure funding is approved for work that will have the highest impact and meet corporate strategic goals. Active leadership over GIS (and data) is necessary to coordinate resources to this end.

Two GIS projects that should be considered for the short and medium term are a property information tool (to aggregate data related to City-owned properties) as well as an AVL/Telematics replacement project (to increase efficiency of fleet operations).

#### 4.2.2 BI and Analytics

The City needs to establish standards and adopt a platform to better manage "data as an asset". Dashboards are becoming commonplace within the municipal space both from an operational standpoint and in the provision of information to customers. The City has leveraged an EOC dashboard, with integrated ArcGIS-based mapping. While tailored uniquely to support the emergency operations process and automate real time information (versus using paper copies of maps), this exercise can be repeated for other areas in the City to allow staff to have greater visibility over their operations.

A key focus should be to conduct a needs assessment across the organization to understand whether a templated dashboard could be developed and then reused in several areas.

#### 4.2.3 Data Warehouse

Although investment and resources will be required to procure and implement a data warehouse, it is a fundamental system and core component of providing enterprise BI and analytics. A warehouse works as a central data repository providing an integration between disparate systems which allows for a "mash up" of data to support broader reporting requirements.

#### 4.2.4 Data Hub

A current deficiency for the City is not having a central repository to access master sources of data. Information is captured and reported through specific systems and databases or through niche tools (like SAP Crystal Reports) designed to process and prepare reports based on data extracted from these sources. Common data sets (e.g., census information, Environics data, community data, facility and asset data, City budgets, organizational data, etc.) provide immense value for staff and currently, not everyone is able to benefit from this information.

We propose leveraging the open data portal (ArcGIS) to become the de facto repository to publish and share data across the organization. Consideration will need to be extended as to whether some artifacts (like policies and procedures) are better suited to be shared using the City's intranet and internet (eSolutions), however, the open data portal provides the ability to manage non-spatial information such as documents, files and media along with geo-spatial data. There will obviously be limits to manipulating information published as a pdf or other document, but the advantage could be that there is a single tool that contains both corporate artifacts and useful data. Further, the open

data portal already has an established process used to upload information and some staff are already using this data.

## 4.3 **Business Solutions**

#### 4.3.1 Business Solution Evolution – A Key Concept

The following concept is important to incorporate into our Business Solutions management practices – and is reflected in initiatives in the workplan for ongoing evolution of the City's business solutions.

Think about the iPhone when it was first launched - without apps, with no video camera, and no copy and paste, or when the original Impala's rolled off the production line in the 1960's without anti-lock brakes, heated seats, or remote locking.

The products that are sold in 2020 may be recognizable as descendants from those original products - but they have evolved and improved in every way from what they originally were to the products that they are today.

Product teams work hard, year over year to make incremental improvements, that when added up over multiple years improve these products immeasurably.

In contrast to a new building that is fixed from when it is constructed, software is similar to the iPhone and the Impala - in that it can constantly change and evolve. Vendors listen to their customers and frequently release updates, enhancements and changes that make it easier to use their software, to offer improved customer services, and to eke out additional efficiencies.

Furthermore, as staff at the City use the software more, they begin to identify where improvements can be made to their processes and how the software could be changed to improve their operation.

However, despite resource and funding constraints, the City has tended to treat implementing large software solutions more like constructing a building, than evolving a product. Other than PeopleSoft, where the City has undertaken some evolution of the platform, a typical approach is a major project that happens once every decade or so, with perhaps one or two major technical upgrades in between. Which means that ideas and opportunities for improvement though known, are often deferred for many years.

For our core business solution platforms (PeopleSoft, Cityview, Maximo, Lagan, Esri, etc.), we need to move to a product mindset, rather than a project mindset, in which we fund and resource ongoing enhancements and improvements to those core platforms. Where we evolve the solutions as they improve, and we learn more about how we can use them.

So, once we have implemented Maximo and Cityview - two of our largest projects for many years - we should expect to continue to invest in enhancing and evolving these platforms as we learn more about them, as the vendor enhances them and as we improve our processes to take advantage of the technology. The following Business Solutions projects underpin aspirations for digital services and streamlined workflow management.

#### 4.3.2 Maximo (Work Management System)

The current Maximo project is underway with broad inclusion across the organization. The City needs to focus on this implementation as a key utility for the organization to not only automate services but also to more efficiently support mobile operations. Maximo also provides an ability to support an enterprise-wide asset management program – something that should continue to be explored along with the City's approach to corporate asset management. As this practice grows within the organization, the City should have mind to, at some point, in acquiring a decision support system and a modelling tool to better guide infrastructure investment. Asset management (much like Records and Information Management) is a discipline for the City – people and process need to be aligned prior to procuring related technology.

Solution launch should provide for significant improvements to work management practices, however, there will be an adjustment and learning period for users as well as administrators of the system from the test phase through to the first year of go live. The initial launch should provide mobility services for a range of City assets and these should continue to grow over time. It is anticipated that subsequent work will be required to evolve the solution. This should include deferred items from the original launch and focus on tackling improvements identified through the initial work. Mobility, asset management and the strategic evolution of Maximo, in general, should be guided by ITGC and a respective Work and Asset Management (Maximo) Steering Committee, which will be transitioned from the current Maximo Implementation Team.

Consideration should also be given to implementing a Road Patrol solution that fully integrates with Maximo to generate work orders and pass through condition-related information.

#### 4.3.3 CityView (Land Management System)

Although not as far progressed as Maximo, the CityView project is also underway with inclusion of parties across the organization. CityView will be a key solution, replacing OLI as well as replacing a number of other processes currently supported through disparate systems or performed manually (i.e., paper-based). The City's focus on this project is to launch the solution, which includes Permits, Planning and Licensing, Fire, Code Enforcement, Cemetery, digital drawing management, mobility services and the introduction of online services. This project also includes significant data migration work from previously used systems.

As with any large enterprise-grade platform, the City must plan for ongoing evolution and enhancement of the tool – as additional processes and services, along with numerous Access database could be consolidated into the platform.

#### 4.3.4 MS Access Decommissioning Program

As a component of the I&RM Strategy (Assessment Report), an assessment was conducted into the use of MS Access databases across the City. Aside from identifying nearly 5,000 databases (many of which were stale dated and not frequently used), the review also identified several which are good candidates for future transition into CityView, Maximo as well as other enterprise applications. Many of the following databases are already being contemplated for inclusion, at some point, over the course of existing work (CityView and Maximo in particular). The City should initiate a project to review all opportunities to consolidate MS Access databases into existing enterprise applications or acquire specific solutions to address current gaps (i.e., time and attendance). Although a more detailed examination is required, the following opportunities identified through the I&RM Assessment process would likely be a good starting point:

Access DB	Function	Potential Migration
Taxi Licensing	Permit management	CityView
Vital Stats	Case management (death certs)	CityView
Real Estate tracking	Index of available City owned property	CityView
Body Rub Parlors	Licensing case management	CityView
Business Licensing	Business license management	CityView
Rezone	SitePlan/Rezone/Subdivision applications	CityView
Communities in Bloom	Property management	CityView
Programs	Customer management	Lagan
Vehicle & Equipt Repair DB	Maintenance case management	Maximo
FMS Work Order DB	Maintenance case management	Maximo
Underground Parking	Asset/Facilities management	Maximo
Facility Repair DB	Case management for Fire	Maximo
IT Inventory	Inventory management	Maximo
Roads	Case management	Maximo
Outdoor Pools	Asset/Facilities management	Maximo
Public Skating	Asset/Facilities management	Maximo
Applications_Software	IT applications	Maximo
Donations	Online Donations app (backend)	PeopleSoft
Day Program Invoices	Accounts payable management	PeopleSoft
Fin Svcs, Insurance & Risk	Case management	PeopleSoft
Total Rewards	Human resource management	PeopleSoft
Work Tracking DB	Time scheduling/tracking management	Time and Attendance
Day Trades	Time scheduling/tracking management	Time and Attendance
Crossing Guards	Resource management	Time and Attendance
FOI Search	Freedom of information case management	Versatile
Corp Records Mgt Program	Records management	Versatile
By-law DB	By-law Indexing	Retire

Figure 6 MS Access review/potential migration options

#### 4.3.5 Lifecycle

More planning with respect to managing the application lifecycle program needs to occur to ensure that necessary updates, patches and upgrades keep within acceptable limits. Strong vendor and relationship management skills will assist in coordinating updates to applications, more specifically, to ensure that applications remain stable and overall value with respect to features provided to the business are aligned with the capacity to do the work in-house. A documented patch management process and standards should be in place and regularly reviewed to ensure a consistent method with which to select, acquire, test and install patches to the City's various applications.

#### **4.3.6 Contract Management**

The City must undertake a project to review the needs regarding a contracts and agreement management solution. This function is currently supported by OLI, which will be replaced by CityView, but which is lacking a comparative solution in CityView.

This process should be guided by a thorough review of the respective process changes that will be required to support compliance across the organization and may be a strong candidate to be addressed as part of the ECM solution.

#### 4.3.7 Meeting Management

There is a similar funded requirement to implement a meeting management solution in support of the Council and Committee agenda publication process. Although such a tool/platform will make the publication process more efficient, it can also provide functionality around automating the current workflow and approval process for staff reports. Both this project and the Contract Management project should be in alignment with the recommendations put forward by way of the I&RM Strategy.

#### 4.3.8 Tax System Replacement

The proposed replacement of the City Tax System (Manta) is a requirement and a project approved for 2020. The City will need to ensure that there are existing IT, PM and business-side resources available to support the project. There is a significant investment to be made in order to procure and implement a new solution so work needs to be gauged accordingly and should be considered through ITGC. A modern tax management solution will not only provide more capabilities for staff to manage internal processes but should also be focused on providing a better customer experience for customers.

#### **4.3.9 Corporate Portfolio and Project Management Solution**

In support of the continued evolution of Portfolio and Project Management within the IT Branch, the City should look to expand the use of Eclipse as a Corporate Project Management Solution. Such a solution is required for numerous teams (facilities projects, technology projects, etc.) and should include project management and planning functionality, task assignment, collaboration and sharing, portfolio management as well as financial reporting.

#### **4.3.10 Human Resources Information Systems**

There are significant opportunities to move forward with changes within the Human Resources Information Systems area at the City, however, they need to be carefully considered through the ITGC process to ensure there are sufficient resources (IT + business) available in order to execute.

The recently conducted Human Capital Management (HCM) assessment conducted by HRchitect has recommended replacing the City's current HR solutions in PeopleSoft.

A supporting Business Case for the HR roadmap/implementation activities (with a focus on improving user experience and digitizing high volume transactions) should be developed and endorsed by ITGC.

A major deficiency that needs immediate attention is in the scheduling, time and attendance area. Currently, there are decentralized, multiple systems (as well as manual, paper-based processes) being used to support this function across the organization. An enterprise system of record should be considered that would standardize the related processes. The system should support significant improvements including: (more efficient) payroll, time and attendance (online vacation, lieu requests, etc.), as well as a scheduling management solution. The proposed procurement should be put forward using a business case and oversight of the project should occur through ITGC. These improvements will require a significant change management process to support adoption from every Branch.

As per the HRchitect HCM review and roadmap, procure and implement a modernized suite of HCM solutions (replacing PeopleSoft) corporately to include improved employee records (position management, progression, anniversaries, etc.), self-service for managers and employees, simplified (and accurate) reporting and analytics, real time org chart, etc. This is a sizeable investment and project that will likely span multiple years so careful consideration should occur as to the resource requirements (IT + business) as well as the implementation timeline. ITGC should be the decision-making forum in this regard and further engagement/endorsement is likely required from Council given the overall scale of investment which is proposed for the solution (approximately \$750K for procurement and resources required for implementation).

#### 4.3.11 Finance Systems Roadmap

The decision to replace PeopleSoft for HR functions may have a direct impact on the future of PeopleSoft for Finance.

It is recommended that, in the context of decisions around the HCM systems, the City also proceed to develop a Finance systems roadmap that looks at the long-term sustainability of PeopleSoft, and considers short, medium- and long-term action plans (and associated budgets) required.

#### 4.3.12 Expert Business Systems

With the changes described in relation to implementing a governance framework, investing in more resources and supporting more broad and careful decision-making on technology projects, the City will have a greater opportunity to combat the current 'supply and demand' issue with respect to supporting smaller (non-enterprise) projects.

Nonetheless, there are a series of 'smaller' projects that must be tackled, including and not limited to:

- Learning Management Systems implementation to support delivery and tracking of training across the City
- A second phase and future enhancements to the Gtechna "Officer" solutions
- A parking access and revenue control system
- Mobile ad-hoc fire inspections using Collector and Survey 123 not planned for Cityview
- A corporate portfolio management / project management solution (potentially an expansion of the Eclipse system currently in use in IT Branch)
- Implementation of a plate recognition solution for parking enforcement (vehicle based)

#### 4.3.13 Enterprise Content Management (ECM) Solution

The City should pursue its Records and Information Management program by following the recommendations contained in the I&RM Strategy which provides for recommendations on the procurement of such a solution. The City should follow the recommendations in that Strategy to ensure the program is sustainable and can fully support the roll out of an ECM.

ECM solutions provide a broad suite of utilities designed to create, process, store and safeguard as well as provide better access to information for staff. It provides the prospect of moving away from Windows-based network shares and supporting automation (and/or self-service) with respect to access privileges. That said, corporate management of records and data is a large-scale, unending pursuit. The City should execute on the other facets of the I&RM Strategy and consider procurement of an ECM solution after the rudiments (people and processes) are in place.

# 4.4 Technology Infrastructure Projects

#### 4.4.1 Business Continuity and Disaster Recovery

Before any further investments are made toward technology infrastructure, the City needs to develop a formal Business Continuity/Disaster Recovery Strategy in order to mitigate the currently exposed risks. This process should start with corporate-wide business impact analysis and risk assessments that identify threats and vulnerabilities, and a Crisis Management Strategy. The outputs from these activities will include recovery time objects for all business services and the technologies on which they depend.

The Strategy needs to include the following activities:

- Business Impact Analysis (BIA):
  - This process should capture all departmental services/process with formalized recovery time objectives and recovery point objectives
  - Upstream/downstream dependencies
  - IT service catalogue dependencies (e.g., applications)
  - Third-party Cloud providers (required to meet Response Time Objective)
- Risk Assessment:
  - Evaluate the BIA assumptions using various threat scenarios
  - Analyze threats based upon the impact to the City
  - Prioritize potential business disruptions based upon their severity, which is determined by their impact on operations and the probability of occurrence
  - Perform a "gap analysis" that compares the existing Business Continuity Plan (BCP) to the policies and procedures that should be implemented based on prioritized disruptions identified and their resulting impact on the institution
- Develop a Disaster Recovery Strategy:
  - Use output from BIA and Risk Assessment
  - Identify critical assets
  - List possible disaster scenarios
  - Develop a technical plan to protect systems and data

#### 4.4.2 Mobility

Mobile working is a major opportunity for the City and a consistent approach is required, rather than one-off solutions for each business unit. There are already several good examples of mobile working – in Municipal Law Enforcement and Licensing Services (Gtechna "Officer") for instance. Mobility is also an area that will be crucial to realize the enhanced functionality provided to the City by way of the Maximo and CityView projects. A mobile platform (devices, connectivity, security, business solutions, and accessories) must be in place to support system implementations that introduce opportunities for users to connect and perform tasks while in the field.

In the short term, the IT Branch will need to work with current and prospective users of mobile working solutions to assess the current usability of mobile solutions, identify short and long-term actions that provide a clear suite of available solution options for mobile working. The City should begin to move to a greater proportion of the computer fleet being laptops and mobile technologies to support increased employee flexibility. To this end, there should be a review of the devices currently deployed and a plan should be developed for rolling out devices that more effectively meets the demands of business units, managers and staff. There should be standards set in terms of the devices provided, however, they need to address the wide range of applicable uses that exist within the City. To ensure more seamless delivery of technology devices, the current practice for identifying lifecycle replacement requirements and for ordering/distributing new devices should be reviewed and documented.

Success in mobility is dependent upon various aspects, including:

- Requirements informed by frontline staff, the real users of the systems (not managers as proxy)
- Business processes clear, well understood business processes, journey mapped and re-designed for a mobile enabled workforce
- Business Solutions solutions designed to be used in the field, by mobile workers, enabling digital, real-time workflows, access to information needed
- Connectivity reliable connectivity (either always-on, or sync and go connectivity)
- Security realistic, easy to use ability to have a secure, reliable connection (e.g., robust mobile-VPN, single sign on)
- Devices suitable devices to work in the environments staff are actually working in (e.g., temp ranges, glove-wearing, sun-glare, battery life, usability, business solutions available on the platform)
- Support defined model for mobile support (e.g., spares for swap out, availability when support is needed such as before and after regular hours)
- Management commitment to effective change management
- Education and training building capabilities
- Compliance monitoring and assistance from management to ensure that team members are using the solutions as designed
- Enforcement business management must hold staff accountable for using the solutions

#### 4.4.3 Infrastructure Lifecycle

Just like any other asset the City owns, e.g., roads bridges, and facilities, IT assets must be maintained, upgraded and replaced. PCs, tablets, phones, network equipment, servers and storage have a lifecycle and must be regularly replaced. Neglecting this lifecycle results in technical debt which hampers the City's ability to be nimble and responsive. Thus, the City invests significant effort each year to maintaining existing infrastructure.

There is an opportunity for the City to review the current process for identifying (laptop, tablet, desktop, mobile) lifecycle replacement requirements, for ordering new devices and for distributing new devices. Existing resource constraints on IT have often created a bottleneck in this area – especially for "non-standard" devices required to support specific implementation projects (e.g., non-standard tablet devices).

Following on from this theme, the City will also need to spend time planning for infrastructure upgrades and integration to Crisys in preparation for Next-Generation 9-1-1<sup>4</sup> services (modernized 9-1-1 services, includes improving reliability, resilience and security of 9-1-1 as well as support for new voice and text services).

While not an overly pressing need when compared to others, City-provided public Wi-Fi is a 'quick win' to enhance network reach and a way to provide services to the public.

<sup>&</sup>lt;sup>4</sup> https://crtc.gc.ca/eng/phone/911/gen.htm

The City should review the overall needs in relation to its facilities and recommend suitable delivery strategies of Public Wi-Fi at civic and community facilities, downtown, parks and open spaces. Before proceeding with any implementation work, the City should consider the business model and whether partnering with another provider (carrier, OPUC) for public Wi-Fi services is worthwhile exploring.

#### 4.4.4 Infrastructure Technology Roadmaps

The City needs a guidebook in order to make the best decisions around the evolution of technology. Without this guidance in place, the pace of options available to the City will simply overwhelm its ability to navigate a sustainable (and highest value) path forward. Due to the current organizational constraints, staff are focused on delivering projects and fixing problems 'in the moment'. While this is necessary, the City should not lose sight of the fact that proper planning can help prevent issues that require ad hoc responses as well as provide a much better framework to deliver more efficient and valuable projects. It also helps to increase the transparency with respect to ongoing investment. We believe the highest value areas to build 5-year infrastructure roadmaps are in relation to the City's network (which should be done in concert with OPUC) and in terms of its overall compute services (to be coordinated as part of a Cloud Strategy).

The City also needs to review its storage management practices and build 5-year plan that addresses the overall business needs. Recommendations from the I&RM Strategy note that there are liabilities associated with keeping data in perpetuity. Further, investigation has determined that there are redundancies and processes associated with the current backup process that are costing the City precious time and money. A data assessment should be conducted to better understand the capacity needs of the organization in order to support ongoing service delivery and legal/record keeping requirements and to identify a recommended future-looking Data Storage Strategy that takes advantage of tiering and Cloud services. As noted within the I&RM Strategy, data classification is also another important roadmap that will better help the City understand how to store data based on its overall importance to the organization.

#### 4.4.5 Office 365

It is recommended that the City plan and execute the move to Office 365 – Microsoft's Cloud-based office, email, calendaring, and collaboration platform.

Office 365 capabilities include broader access to up-to-date Office products (staff can install on various devices, including tablets and phones) as well as OneDrive (Cloud file storage and sharing), SharePoint (document and records management and collaboration, including version control), and Microsoft Teams (digital meetings, chat and discussion) as well as numerous other collaboration capabilities (e.g., Kanban boards (Planner), workflows (Flow, SharePoint)).

The City already holds licensing for these products through its Microsoft agreement, and these tools can provide the modern collaboration environment that City management and staff have identified as important needs. This platform can also be used to connect outside workers digitally to the organization, by providing accounts and access to services from their personal devices.

Initial migration of email to Office 365 would be the priority – to deliver an improved mobile email experience (replacing Boxer – a source of significant complaints) followed by expansion to incorporate Teams and other collaboration technologies (including SharePoint and OneDrive).

It is important that the City recognizes the significant impact of this change and focuses upon change management for staff and that this work is aligned with activities recommended in the I&RM Strategy. IT and the Clerk's Office must work closely together in this area.

#### 4.4.6 Security

With the escalating number of cybersecurity attacks now specifically targeting municipal government, securing civic and personal information should be a high priority task for the City. The City of Woodstock recently endured a ransomware attack that crippled the City's operations for weeks, reportedly costing the City over \$1,000,000 in direct costs, and countless more in reputational damage.<sup>5</sup>

In order to ensure a tailored approach for the City, it should engage a third-party security expert to assist with the development of a Security Strategy and framework that acts as the launch-pad for an updated security program. It is recommended that the City consider a plan for the out-tasking of ongoing security operations. It should be noted that this external service is one that many other cities are now considering along with the (often necessary) shift from capital to operating funding streams. External providers provide subject matter expertise that staff may not possess or have time to invest in.

At a minimum, a continuously optimized security program should address:

- Security Posture Assessment Scores (CMMI Rating Scales for current & target)
- Security Remediation Action Items based on Capacity, Budget and Risk Priorities
- Security Ecosystem Map
- Security Remediation Roadmaps
- Vulnerability Assessment Reporting
  - Technical Vulnerability Assessments
  - Sensitive Data Assessments
  - Social Engineering Vulnerability Assessments

#### **4.4.7 Collaboration Tools**

There are numerous collaboration tools available today that provide for easy, efficient ways for staff to work together. Some of the key benefits of online collaboration tools are:

• Centralized access to communications, documents (online storage), contact information and other artifacts supporting project/collaboration teams

<sup>&</sup>lt;sup>5</sup> https://lfpress.com/news/local-news/woodstock-cyber-attack-costs-mount-to-million-dollarmark/wcm/b43fbd3b-8c62-4734-9f2b-177e899fee5b

- Version controlled documentation, some of which can be edited by multiple users at the same time
- Increased productivity by providing insights into user activities as well as the overall group's progress made
- Remote access to meetings and content supported by real-time information exchanges, some which allow building drafts through digital white boards

Commonly, tools that are packaged with current platforms owned by cities (e.g., Microsoft Skype) are selected for rollout and this is a sensible way forward. Although the City has rolled out Skype, it is not broadly used. As this was one of the first modern deployments, the City should conduct a "lessons learned" review and reconcile best practices (e.g., communications needs, training, support, etc.) in order to grow user adoption. Going forward, more attention will likely need to be paid to adoption, from IT and business leaders, as well as those who support driving change throughout the organization.

The City also utilizes the "2Big4Email" tool for staff to use when transferring large files to external parties. That said, it has been noted to be complicated to use and challenging for 3<sup>rd</sup> parties to interact with. The City should learn from its Skype rollout to drive the implementation of a modern large-file transfer solution that is available to all (and integrated into the City's chosen collaboration solution).

Although more remote and digital meetings should be something to strive for, the City should make in-person meetings similarly accessible for staff. There should be a standard set for board and meeting rooms (teleconference tech, TV screen, camera) in City facilities to help support more efficient investment in meeting room technology.

Although a 'big bang' approach to this work is likely unfeasible, the City should select one room to pilot a standard that can then be used for future renewal projects.

# 5. Technology Delivery Model

# 5.1 Importance of Clarifying and Focusing the Technology Delivery Model

Of course, *which* services and business processes the City should apply technology to and *what* technologies should be implemented are core to this Strategy.

However, more critical for the City is *how* technology is managed, and *how* new technology is to be delivered. We need to set ourselves up for success, not failure.

As noted in earlier sections, the City's IT Branch is currently resourced to operate not innovate. None of work identified in the previous two sections will achieve the desired outcomes within realistic timeframes without adequately resourcing the IT Branch or business units to deliver on the program.

# Thus, sustained investment in IT resources to effectively deliver projects and programs and support them once they have been implemented must be the City's top technology strategy priority.

In addition, setting up a far more effective engine of partnership for delivery and support for technology and technology-powered business transformation initiatives is key – without this, all the good ideas to apply technology to community and operational challenges will not realize expectations or will take far too long to come to fruition. A new governance model has been approved through the Information and Records Management strategy and its extension for broader IT Management is discussed in Section 7.

Note however, that technology savvy cannot and must not be limited (or handed off) to the IT Branch, it must be infused throughout the City. To be a tech savvy organization requires strong *executive and business* leadership to advance with technology as an organization. These concepts and ideas are discussed in the chapter following this one.

## 5.2 Setting IT up for Success

Firstly, refreshing the model for IT service delivery is key.

#### A Centralized IT Model

The City is and will continue to formally operate a **centralized IT model** – in a constrained resource situation, this is the most effective mode of utilizing resources. This means that technology resources are based in a central, Corporate Services function with clearly defined roles and responsibilities for both IT and business units.

#### **Target Model for IT Services**

Secondly, based on discussions with CLT, using the model discussed in the previous section as reference, it is recommended that the City should target for the IT Branch to

operate at the Partner Player level. Thus, this Strategy recommends that the City pursue this target.

This is done while acknowledging that there are deficiencies in the IT Branch's current ability to operate as a Solid Utility or a Trusted Supplier today which will need to be bolstered before the Partner Player level can be achieved.



Figure 7: Recommended evolution of IT's capability and role within the City

To achieve this, it is recommended that the City:

- Reallocate a significant portion of the existing Annual Technology Projects fund to the IT operating budget to address critical current IT staffing gaps (discussed further, later in this section)
- Ensure future technology project budgets include the necessary capital to fund temporary contract resources in the IT Branch and business units to ensure effective project delivery and realization.
- Ensure that necessary operating impacts (staffing and licensing) as a result of implementing new solutions are accurately reflected in operating budgets.

#### **Progressive Approach to Achieving Partner Player**

Based on this direction, the Strategy recommends that the City's IT Branch progresses from its current position as a Solid Utility, to Trusted Supplier and then on to a Partner Player over the next five years.

The first step is about building momentum – enhancing the ability to deliver core services and projects. Recommendations are designed to gradually transition the IT Branch towards the goal of becoming a partner player.

#### Step 1: Solid Utility

The primary challenge that the IT Branch faces today is that the team is too busy and has too little time to put in place the right processes and practices that could help them be more efficient. Plus, with Operations and Applications teams running around solving problems and responding to requests, they deal with many interruptions and thus can't do their best project work. So, the IT Branch's ability to be the Solid Utility is being compromised.

The first task is to shore up the IT Branch's ability to provide the Solid Utility service.

It is recommended that this is done by creating the Manager, Client Services role discussed later in this chapter. This is a key first piece of the puzzle, which frees other managers in the team from firefighting, allowing them to direct attention to managing their teams (less time is spent managing problems). The Manager, Client Services will also take on responsibility for numerous IT process improvements that the IT Branch simply hasn't been able to get to (e.g., on and off boarding).

The Manager, Client Services will lead the establishment of a formal help-desk team, with some of the members of the current Infrastructure team moving to be part of Client Services. We also propose to add a full-year co-op student to this team to triage issues.

This change is specifically designed to free up the Infrastructure and Security team to focus on effectively managing the core infrastructure, getting the discipline in place to allow for robust testing before deploying changes and thus improving reliability, making time for longer term planning, focusing on architecture, etc.

Subject to approval of the roles identified above, we believe the Solid Utility level can realistically be achieved within 18 months.

A consistent message from some departments has been the need for increased IT support outside of normal office hours. The IT Branch will explore staggered hours and other options – but formalized support out of hours requires a formalized service from IT Branch. This will require defined services and criteria for triggering out of hours service, it will involve standby and call-out payments and various other arrangements.

During 2020, the IT Branch will work more broadly with Finance to review IT funding, including looking at how funding after-hours services (by those that need the service) will be handled (e.g. budget adjustment).

In future, for those departments that require a higher level of IT service departmental funding may be used to fund additional positions within the IT Branch that will be assigned partially or fully to a department. In these cases, that staff member will be a member of the IT Branch and report to an IT Manager but will likely spend some or a significant portion of their work time located at the Department's work location(s).

#### Step 2: Trusted Supplier

Next, the ability to deliver projects on behalf of the business is the target of the IT Branch becoming a Trusted Supplier. Of course, the IT Branch and the City must do this while continuing to sustain the Solid Utility service level.

Going forward, it is recommended that project delivery should be part of the IT Branch role and mandate.

While there is a Manager, Projects and Portfolio within IT there are no Project Manager roles within IT to support this delivery mode. Instead, IT Managers predominantly, or IT staff occasionally, take on this role. For larger projects (e.g., Maximo and CityView) the practice of seconding or assigning dedicated staffing has been broached for the first time.

Applying dedicated and experienced *technology* project leadership is proven to significantly improve the chance of success for projects, hence the focus in this area. This will also free IT Managers from day-to-day running of Projects (and heroic actions), allowing them to focus their attention on management tasks (planning, managing the flow of work, and developing the full potential of their team members).

In the medium term, it is recommended that the City bring some Project Management positions in-house as permanent resources – to establish continuity and the better understanding of business needs.

Ideally, the IT Branch would achieve Solid Utility status before shifting attention to becoming the Trusted Supplier. In reality, major projects are underway and planned – and capital funding has been earmarked for project implementation.

IT Project Manager and other contract roles are critical for the IT Branch to meet the expectation of a Trusted Supplier. So, capital funded contract roles will be used in 2020 and going forward to support project delivery.

Going forward, the City must formalize the bundling of project staffing costs (in IT and in business units) with implementation costs for technology projects as part of its project proposal, budgeting and approval processes. This will ensure that the total cost of implementation is accurately and completely budgeted and capitalized. This mode of operation – contracted resources used to deliver project work – will be a constant, not a temporary situation.

Toward the end of 2020, budgets will go forward for 2021, and they **must** include the required funding for contract project staffing needs. The same will occur in 2022 and so on. As noted earlier, bundling project staffing costs with purchase costs is critical to starting projects on the right footing.

Following this approach, we believe that by early 2022, the City should be into a good routine of contract staffing projects. At this stage, the IT Branch should be on its way to achieving Trusted Supplier status.

#### **Step 3: Partner Player**

Once the Solid Utility and Trusted Supplier modes are stabilized, then the IT Branch can begin to unlock the Partner Player capability, again, while continuing to operate as the Solid Utility and Trusted Supplier.

In this phase, we suggest the transition from IT Director to CIO; we also suggest that the delivery engine of IT should be working more effectively, freeing time for the CIO and IT Managers to focus increased attention to relationship building and management activities with business unit leaders.

We have focused initially on Data and GIS as a key area where this partnership role can flourish. The Data space is a new area to tackle; without resourcing, it will be challenging to drive forward effectively. We have recommended a GIS Strategy be tackled in 2022 – and this should look at how GIS resources can be most effectively leveraged at the City.

We have recommended a Data and GIS Program Manager (a DM Program Manager is recommended as part of the I&RM Strategy) to take a leadership role in this area.

We have also suggested that contract Project Manager / Business Analyst roles become permanent positions that can build long and stronger relationships with the business units they serve.

# **5.3 Technology Roles and Responsibilities**

With the recommended evolution of IT's role, establishing a clear framework for the assignment of roles and responsibilities around technology management and deployment is important for consistency and repeatability.

#### 5.3.1 Roles and Responsibilities in IT

Because there has been a blurring of the lines of responsibility, it is recommended that the City, through this Strategy, confirm and set the targeted mandate for the IT Branch.

#### **IT Branch Mandate**

To be a high-performing team that provides service excellence and leads the implementation and evolution of modern technology systems to advance City strategies and benefit our community. In support of this mission, we will:

- Ensure that strategic plans, policies and processes are in place to help guide digital transformation under the guidance of ITGC and in alignment to City Strategy,
- Foster transparency and accountability by way of evolving technology infrastructure, platforms and systems designed to enhance experiences for staff and customers,

- Actively seek partnerships, both within and outside of the organization, to ensure technology and services respond to defined needs and provide the best possible user experience,
- Work with partners to provide leadership and demonstrate the value of emerging technologies.

In support of this mandate, it is recommended that the IT Branch evolve over the next 3-5 years to provide the following functions:

#### **IT Leadership Function**

- IT Strategy and planning
- IT governance
- IT performance measurement and reporting
- IT financial management (budgeting)
- IT Business Relationship Management
- IT Policy and standards
- IT architecture coordination
- Risk and compliance management
- Vendor and contract management (in partnership)
- Technology Training and Education program coordination

#### **Client Services Function**

- Incident Management 1st level technical support (including knowledge base management)
- Identity Management User account management (Active Directory and systems) (creation, deactivation, group membership)
- Request Fulfillment for standard services including productivity software support, device (PC, laptop, tablet, phone) and peripheral (scanner, printer, etc.), software access provision and package deployment, A/V support, mobility support
- Asset management, license management, inventory, procurement incl. fulfillment and onboarding
- Service catalogue management

#### Technology Provisioning Function

- Responsible for Technical Management (infrastructure design, build/acquire, test, operate and discontinue)
- Technology architecture (including standards and roadmap)
- Network (WAN, LAN, Wi-Fi) telephony, mail, messaging, unified communications
- File and print infrastructure
- Computing platforms (including servers, workstation, tablets, etc.)
- Remote access and mobility technology
- Cloud infrastructure solutions
- Security defense (e.g., firewall, intrusion protection, anti-virus, anti-malware, spam)
- Data centre
- Backup and restore management
- Disaster Recovery operation (IT Service Continuity Management)

#### **Business Solutions Function**

- Responsible for Applications Management (Business Systems design, build/acquire, test, implement, operate and discontinue)
- Solutions architecture (including standards and roadmap)
- Systems planning
- Systems integration and middleware (incl. with business partners, customers, and agencies)
- Enterprise and expert applications
- Web and digital solutions
- Cloud business solutions

#### **GIS & Data Function**

- GIS technology and data architecture
- GIS platform design, planning and management
- Integration of GIS and non-GIS systems
- GIS data acquisition and exchange
- GIS operations including GIS core data management, mapping and analytics on-demand
- Enablement of divisional / departmental GIS analytics, mapping and reporting
- GIS education and training program
- Business Intelligence (BI) framework, BI, reporting and data platform, data warehouse management, and Master Data Management program
- Enterprise dashboards, enablement of divisional / departmental analytics and reporting

#### Strategy, Planning & Project Delivery Function

- IT Strategy and planning
- Project portfolio management including intake of technology projects and governance support
- Project management for technology projects
- IT resource management and planning
- Monitoring and reporting across the IT project portfolio
- Responsible for IT Business Analysis function including supporting the development of Business Cases, Business Requirements (including process/data models)
- Working with business units to develop Selection Criteria/Build Specifications and Test Plans to verify user requirements

This means that the IT Branch will work towards taking on responsibility for:

- Solutions, Data and Technology Architecture
- Project Management of Business Solutions and Technology projects
- Business Analysis business process review and design assistance, requirements development and business case development
- Leadership and coordination of the corporate GIS work program
- Leadership and coordination of corporate data work program, including data standards, Business Intelligence and analytics work

#### **Roles and Responsibilities Outside IT**

Pragmatically, there is much work ahead in the IT Branch. So, it is recommended that technology/digital areas of responsibility currently outside of the IT Branch continue to be led by other teams, but with active participation and partnership of IT Branch representatives and supported by formalized governance and performance-based processes. The IT Director/CIO is responsible for engaging and becoming actively involved in each of these programs.

#### Web and Digital

The Corporate Website and community engagement websites should continue to be managed by the Corporate Communications function and aligned with the City's customer service strategies. However, it should be noted that Corporate Communications assumed responsibility of two external websites without additional staff and are, like the IT Branch, under-resourced as per the 2018-2021 Communications Strategy.

This work should align with the Architectures and Business Solutions work. It is suggested that the City expand the mandate of the Website Steering Committee and consolidate the existing Forms Committee into a Web and Digital Steering Committee (which would operate as part of the overall technology governance framework discussed later in this document) as a means of coordinating an annual Web and Digital workplan, which would in turn, be coordinated and aligned with the overall technology workplan.

#### Innovation

Technology is a central component, of course, to innovation – but innovation can also be independent of technology. The IT Branch should support, participate and catalyse innovation work in partnership with the Innovation and Transformation Branch.

Furthermore, there are a wealth of opportunities to work with TeachingCity in and around technology and data programs to bring community innovation and the education community to bear to City challenges and opportunities. While the IT Branch should work with the TeachingCity program to develop a framework for ideating, testing, piloting and then operationalizing ideas, the leadership of the TeachingCity program is, of course, appropriately managed elsewhere.

#### **Smart City**

The overall leadership and coordination of the Smart City Strategy is likely to be coordinated elsewhere while the IT Branch addresses its progression to the Solid Utility and Trusted Supplier roles.

However, the IT Branch has a central part to play in Smart City and should be actively involved in discussions and planning – particularly with regard to architecture, standards and principles that will make Smart City initiatives inter-connect and integrate. Technology isn't and shouldn't be driven by IT – a partnership with business units is vital to the overall success of any project, program or transformation.

Efforts to improve the capability of the IT Branch outlined here should not be interpreted as a reason for departments to hand-off more to IT and become less engaged. In fact,

the direct opposite is the case – we need business units and business leaders to be more engaged than ever.

With the IT function responsible for the activities identified above, Branch responsibilities are in the following areas:

- Ongoing engagement and active partnership with IT through the IT Branch Business Relationship Management program
- Engaging early and partnering with IT in the idea, conceptualization and planning for <u>all</u> technology solutions that store City data or are accessed across the City's network
- Active project accountability, leadership and sponsorship (DRI)
- Commitment to adequately resourcing initiatives and ongoing systems with power users and Subject Matter Experts (SMEs) through funded secondments
- Understanding and keeping up to date with business systems capabilities and how to leverage the capabilities
- Driving the utilization of business systems in business areas and aligning systems to business needs
- Business systems testing (upgrades, software changes)
- Business process ownership and design
- Leading adoption and change management programs in support of systems implementation
- Leading the delivery of training for business systems
- Simple (contained) business system configuration and end-user workflow configuration (not including user lifecycle events)
- Data stewardship, data management and data editing activities
- Data analysis, analytics and reporting
- GIS data management
- GIS exploitation / utilization
- Participation in vendor relationship management in partnership with IT

Note: Coding and development work, technology procurement (software, hardware and services) and systems architecture work should not occur in Branches, excluding any formally agreed exceptions.

# 5.4 Building a High Performing IT Team

With the model established and roles and responsibilities defined, the City needs to establish a suitable and sustainable IT organization that can deliver on the mandate.

Revisiting the current IT organization, Figure 8 illustrates a high-level summary of the current IT organization.



Figure 8: Current IT Organization

The IT Branch is built around 2 business units – *Operations* and *Applications*, with a recently established Projects and Portfolio Manager role – with no current staff.

The headcount for the IT Branch is 23 FTE, with one temporary FTE secondment to support the Maximo project.

A number of new positions are identified and recommended to be phased in over the next five years – based on priority.

It is recommended that a significant portion of the City's Annual Technology Projects (ATP) fund, currently set at \$500,000 annually and administered by ISSC, be reallocated to the IT operating budget to fund a number of the new IT positions recommended in the section above. It is recommended that approximately \$400,000 be allocated for this purpose.

In the absence of an ATP fund, going forward, all new technology projects should be proposed through the usual capital budget process and should be subject to IT Governance review and approval – based on a clearly established business case.

The reality of modern IT, particularly with small municipal teams, is that it is impractical to maintain in-house the necessary skills and capacity to plan, implement and manage the City's increasingly complex technical environment and burgeoning project demands. To do so would mean hiring an unfeasible number of additional IT staff – significantly more than that recommended in the section above.

Smart IT organizations approach this challenge by relying on a team of in-house IT staff with strong internal connections and understanding of the organization's business needs, who in turn work with a network of trusted partners, vendors and solution providers to deliver the required services.

Similar to the way that the City approaches road building and road maintenance – relying on construction firms with road building expertise – the emphasis is on "getting projects done", or "project throughput" rather than on IT staff necessarily implementing the technology themselves.

This is a hybrid model of IT service delivery that combines internal IT and business skills with market-based expertise and services. Ultimately, it means that the IT Branch, the IT Director and Managers will begin to work more as coordinators or orchestrators of IT service delivery – which will be executed by a combination of internal staff and external providers.

To effectively operate in this way, the IT Branch and its leadership need to develop new skills around contract negotiation and vendor relationship management, risk, contract management and dispute/conflict resolution.

The City's goal is to increase speed, agility and project throughput by using the right mix of resources and skills for the job at hand. Several approaches are common in municipalities for augmenting internal IT resources, including:

#### **Capital Funding Contract Staff Positions**

Projects are proven to be successful when staff can be dedicated to the project – not working off the side of their desk.

To achieve this level of dedicated attention to projects, municipalities commonly use contracting for short term staff (1 to 2-year contracts). Costs for staffing contracts are 'bundled' into the total capital cost of the project. Thus, when projects are approved the appropriate staffing to execute the project is also approved.

In 2020, a number of projects, including Tax, Maximo, Next-Generation 911 (NG-911) included funds for short term contract staffing in IT to assist in their overall delivery. Contract project management resources are being used to deliver technology projects.

As part of the 2021 budget process (and going forward) the City must ensure that all new technology projects capitalize short term backfill and project resource needs in IT **and in business units** as part of the overall project budget. Entering into these projects without this secured will continue to lead to lengthy delays in project execution.

For each project, CLT must consider – does this project have the following roles assigned and can the individuals dedicate the amount of time required to actively participate in the project at the level that is required?

- DRI/Sponsor
- Project Manager
- Business Analyst
- Business Lead
- Subject Matter Expert
- Technology Lead
- Change Manager

Contract staff may be used directly on the project but are more typically hired to backfill IT or subject matter experts in business units, freeing up internal staff (who have a comprehensive knowledge of how the City works) to support projects. This allows the City to retain the accrued project learning and expertise, and to offer development opportunities to internal staff.

Because of the regular need to bring in additional IT and subject matter business resources to support project activity, numerous municipalities (e.g., Richmond Hill, Guelph, Mississauga) have embraced a roster or Vendor of Record (VOR) model. In this approach, the City would establish arrangements with one or more firms that can supply experienced IT resources (Project Manager, Business Analysts, network or security specialists, GIS experts and other technical resources to the City) on-demand and at pre-set rates.

#### Service Providers: Out-Task IT Service Components

While wholesale IT out-sourcing is uncommon in the municipal sector due to the complexity of municipal operations, the City should adopt selective out-tasking as a Strategy to augment internal resources – again, reducing the need to add new IT staff.

Because of the increasingly commoditized nature of IT infrastructure, this is an area where out-tasking can have the highest value and impact. In fact, the City already does this in a number of places. For example, the way in which the City manages the rollout of its devices – relying on a service provider to purchase, configure and deploy new devices to staff, but also to collect and return the machines that have reached the end of the lease. There is great scope for additional use of this model, and we would encourage the City to investigate and consider options.

One particular area where municipalities are increasingly leaning on managed services is with IT security services. This work is challenging for organizations with small IT teams to keep up with, mainly in respect to monitoring the myriad of threats that expose the City to risk and in building the team with the necessary skills and capacity to effectively manage the program.

By out-tasking suitable work, the IT Branch will be the orchestrator of IT service provision, matching the needs of the organization to service delivery – either provided

internally by IT staff or by 3<sup>rd</sup> party expertise. The provision of service should be entirely transparent to City management and staff with the overall performance level actively monitored and reported on.

Continuing to expand the areas in which the City leverages the private sector to manage commoditized aspects of the IT service is a key strategy for the City to continue to pursue.

#### **Use External Expertise to Plan, Design and Set Strategies**

Setting strategies before tackling projects is important to successful outcomes (measure twice, cut once). Fully exploring possibilities before diving in is essential. In this area, there is clear value in engaging experts in the right measure and at the right time.

Consultants with deep domain experience and with experience in developing strategy and implementing solutions can help to guide the City in developing plans that properly leverage systems' capabilities to address business challenges.

#### Leverage Strategic Partnerships

Although the IT Branch is capable of designing and implementing great solutions, it doesn't always mean that it is the right approach. Looking forward, when evaluating opportunities, strategic consideration is needed to determine whether the City is best suited to deliver a solution or whether the City's role is to commission another partner (in the public or private sector) who may be better suited to address the need and operate the solution.

In fact, the City's partnership with Oshawa Power (OPUC) around dark fibre and high-speed connectivity around the City is one such example. By partnering with Oshawa Power for them to provide dark fibre, the City has saved significant costs (in the order of millions of dollars over the last decade) and achieved much higher levels of service as a result. This is an example of a win-win where the capabilities of both organizations have come together for a great result for Oshawa taxpayers.

Some municipalities have built their own Public Wi-Fi networks, committing their own resources and time to the work. In this area, for instance Burlington has partnered with the local telco – Cogeco – which now provides public Wi-Fi in City facilities and in parks as well as other civic spaces.

In this example, a partnership with an organization that possesses strong expertise has allowed customers to receive a great service, whilst IT resources can focus on other areas that are better aligned with their overall skills and capacities. In this situation, orchestrating the delivery of the service has been the role of the City – not building and operating.

Continuing to work with the Region, as the City already does, and with other municipalities in the Region to "piggy-back" on purchases and explore opportunities for joint project implementation, is another example where the City can gain value through strategic partnerships.

Given the pressures on internal IT resources that have been identified, the City should think strategically around the opportunities for partnership as it considers technology-enabled initiatives and service delivery. Working with its University partners, Oshawa Power, Durham Region and others are ideal partners to help share costs and work effort.

In the medium term, as the City begins to transition to the Partner Player mode, the City would benefit from a Chief Information Officer (CIO) role (as is in place at Burlington and Barrie, Markham, Richmond Hill and Brampton).

What is the difference between a CIO and an IT Director? The following table outlines the typical differences in the functional responsibility between an IT Director (typically focused more on operations and inward focused), compared to a CIO (more outward focused).

#### 5.4.1 IT Leadership: CIO vs. IT Director

IT Director/Manager	CIO
A member of the middle management team who executes and controls	A member of the executive team (or at least plugs directly into corporate strategic decision-making) to influence and inspire
Central focus is on maintenance and IT Operations	Primarily focused on business opportunities and drivers
Business area and IT (inward) focused	Focused on the enterprise and how technology can be leveraged to meet strategic objectives
Process and procedure focused (how to perform)	Strategy and execution focused (what to perform)
Works with the intent to provide stability at all cost	Critical in times of change, focused on positive disruption and collaboration as a means to drive innovation across the organization
Generates tactical plans strictly focused at the project or program level – typically requires outside strategic assistance	Engages the corporation to develop and execute strategic technology plans
Aims to complete projects and deliverables on time and within budget	Aims to implement projects but extends vision to managing and improving related outcomes
Focused on the tech first	Customer-centric
Responsive to demands, reactive in nature	An evangelist for technology and the business who works to create new value, proactive in nature
Budget focus is on sustaining operations and utility	Budget focus is split between innovation and operations (bimodal)
Avoids risk or seeks opportunities within given technical capacities	Is open to manageable risk as well as working with outside partners to deliver on value that cannot be fully supported in-house
Develops regulations, process and policy to control behaviour	Relies more on engagement, training and collaborative activities to sponsor and support change management

Figure 9 CIO vs. IT Director role comparison

The growth of the CIO within municipal organizations is directly proportional to the rate at which technology supports and enables city work. Active, strategic leadership is required to help work across a city and identify priority programs that can be built, strengthened and enhanced through technology and data. Although the role of the IT Director will often be required to collaborate between business units, the need to manage the (huge breadth of) tactical day-to-day operations will often limit opportunities. The CIO position is less encumbered with operational oversight and as a

result can better focus on working with other City leaders, outside partners and other agencies to develop the City's future technology roadmap.

A CIO is an evangelist who advocates for technology – but only in support of achieving business outcomes and corporate strategic priorities. Working as a translator, teacher and coach, CIOs build networks and leverage relationships in order to support the change required to realize success with technology. They, however, cannot do it alone. The transition to a CIO requires executive leadership to commit to providing them with access to decision-making forums and processes upon which they can actively participate.

# 5.5 Recommended IT Service Improvements

In addition to the solutions projects identified in Section 4, the following IT service improvement projects are also identified in order of priority.

Currently, Spiceworks is used to manage IT service delivery through the Help Desk and in support of some other work. Although full deployment and use of the current tool is not ideal, the City should consider replacing the product with a more robust tool that can optimize processes and workflows as well as provide for some automation – both in respect to providing transparent communications surrounding issues for the users as well as providing them with self-service and self-help capabilities to reduce resource allocation to "smaller" issues. A robust, fully implemented ITSM solution could also provide capabilities that the City is currently lacking, such as:

- Providing (easy to get) data to evaluate operational performance (e.g., KPIs against SLAs) to drive more accountability
- Providing knowledge management for IT and other staff, including service standards which are "baked in" to workflows
- Maintain a service catalogue for IT and other staff

Supporting IT asset management (integration of asset management and service management provides several benefits both in support of deployment efforts and the overall technology procurement process).

One way to leverage an ITSM tool and better understand the overall performance of IT service delivery is to conduct regular service reviews (i.e., audits). This, along with analytics derived from the ITSM tool, will provide for more clarity in terms of incident patterns, time to resolution and overall effectiveness in meeting service level targets. Currently, IT does not manage services in accordance to defined SLAs but should develop these over time to curate more exact measures to help manage the deployment of IT resources in response to the needs of the organization. In order to evaluate effectiveness in response to SLAs, the IT Branch should also develop relative KPIs that can build a performance baseline with which to improve.

Other metrics surrounding financial/risk management, operations and customer service should also be developed to help identify areas for improvement. Our recommendation would be to start small and select a few measures that are meaningful to both IT and

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the business. Tracking performance is an extremely valuable practice, not only in support of continuous improvement efforts but also in support of validating (or not) the assumptions that have historically been made to resolve issues and manage services "in the moment".

Although there are many conventional practices employed by the IT Branch, few are documented. Without documented (and approved) policies known to both IT and the organization, it becomes challenging to improve upon service delivery and track overall progress. Although there are many processes that need more rigor and care, we recommend starting with the following processes particularly in support of formalizing IT service delivery across the board:

**Incident Management** – as part of the process to replace the existing ITSM solution, the incident management process should be reviewed.

- **Problem Management** a close companion process to that of incident management that looks to determine the root cause of recurring incidents. The overall goal of the process is to identify and define an issue and then work through to resolving that issue so that future related incidents do not occur.
- Change Management technology changes are necessary to support overall
  modernization efforts and evolving business requirements. The IT Branch should
  review its current change management practice and ensure that a process is
  being followed to support changes that may affect the organization or parts
  thereof. Making changes to employ new capabilities or to harden the backend
  supporting outward-facing solutions must be a strategic decision that considers
  any potential disruptions for users as well as IT's ability to analyze, test and
  deploy the change (as well as manage the IT/external resources necessary to
  perform it).
- **On/Off Boarding** the IT Branch should facilitate a review of the employee on/off boarding process. This process should be reviewed in partnership with the HR, Finance, Facilities and Parking areas to ensure technical tasks are aligned with other processes. This "shared process review" should be the first of many for IT which can work to improve relationships and provide for a more seamless experience for customers.

These policies can be sourced through other municipal IT departments, MISA as well as through industry standards such as ITIL. Although the processes do not need to be "invented", there should be significant time spent developing them to suit the City's context and then they should be reviewed regularly (perhaps as part of the service review process) to ensure the content evolves along with IT's capabilities to deliver service (as assessed through repeatable activities measured against a performance framework).

The City is complex and provides for a range of services, some of which do not operate between 8:30am and 4:30pm. Outside of traditional operating hours, there is no formalized process to help mitigate and respond to IT issues that occur. Staff typically defer to calling one or a few IT people who are known to respond and attempt to resolve

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the issue. A fulsome, city-wide review should be undertaken to fully understand the business needs outside of regular business hours and address them in the most cost-effective manner possible.

Some considerations could be to:

- stagger shifts to extend service hours
- engage a 3rd party service provider to resolve tier 1 issues
- develop a call-out roster, as well as
- create higher level SLAs with business units that require out-of-hours support.

Likely, a response to this issue will be a hybrid approach and will require some "testing time" to value the overall effectiveness. The proposal (and subsequent reviews) should be forwarded to ITGC to support the approach and necessary investment.

The move to the Cloud is a true industry paradigm that has gained steam in recent years, to the point where it is becoming increasingly difficult in some areas (e.g., HR systems, as acknowledged by the City's recent HCM review) to find vendors that provide on-premise solutions that will meet the needs of the City. This trend is expected to spread into other solution areas (e.g., CRM, Finance, etc.) over the coming years, and thus is irresistible.

Many municipalities have now embraced Cloud service and have moved to the Cloud for email services (Office365, G-Suite), or are in the planning stages of doing so as it can provide for some efficiencies in the overall support of these capabilities as well as give users a productivity suite that can be accessed anywhere, from any device. Some have more aggressively adopted a "Cloud first" approach.

The City has not yet begun to formally adopt Cloud-based services for technology, but it is undoubtedly in the City's future and the City must be prepared.

In the short term, the City will need to establish a clear policy around the adoption of Cloud technology that identifies and mitigates concerns, provides clear guidance on when and when not to leverage Cloud technology, and provides a checklist of requirements that Cloud solutions must meet in order to be used by the City.

Aside from the tactical decisions that should be addressed when considering Cloud solutions, the City will also need to consider that the funding model will likely be OpEx as services are typically structured around monthly payments.

Another important factor to note is that although some Cloud technology has the prospect of saving time and supports resources for a product, there is an increasing need to manage the vendor to ensure the service received meets the standard of the contractual agreement.

The TeachingCity Partnership is a collaborative entity of which not many cities have the benefit. The model provides a valuable relationship with education and research partners that can be leveraged to support projects, initiatives or tasks that current staff resources may not have time to fulfill. Leveraging this partnership through a "lab

environment" and research model provides practical opportunities for students to work on real world issues and provide the City with a young, innovative and open-minded workforce that is likely inclined to help in a number of different areas. The IT Branch should explore this partnership in relation to initiatives like open data (and Information Management in general), cybersecurity user experience / customer service experiences, collaboration tools and GIS.

# 6. Becoming a More Tech Savvy Organization

While we have focused on the IT Branch, the role of Commissioners and Directors, Managers, Supervisors and staff in Branches is equally important to championing digital and achieving success with technology.

In fact, there is a clear correlation between the tech savviness of the leadership, to how the organization is successful with technology.

### 6.1 Develop Increased Business Leadership Tech Savvy

To become a more tech savvy municipality that better leverages technology, the current and future leaders of the City need to understand technology, the potential of digital and how to successfully implement technology and digital-enabled change.

This does not mean that leadership must understand at a technical level the details of the technologies. It also doesn't mean *"being good with computers"*. Mostly, it means that leaders have a good conceptual understanding about what it means to be a digital organization, and how to be successful implementing digital and technology-driven change and capabilities.

We suggest that a digital/technology education program be instituted at the City to help leaders and managers fully understand and embrace the potential of technology and understand what it takes to realize the promised benefits. The proposed governance model, that sees CLT and Directors more actively involved in technology initiatives and decision-making, is part of a concerted strategy to increase institutional knowledge and learning through active participation.

# 6.2 Business Leadership Responsible for Business Transformation

While the IT Branch *is* responsible for helping business units implement technology-driven change, technology and digital thinking needs to be at the heart of business strategies for each business leader. Technology cannot be an afterthought or an add-on, it must be central to the achievement of business outcomes.

Furthermore, moving from paper-based to digitized processes involves persistent organizational as well as technological change for each business unit and for IT. Such change is a genuine transformation – as a result of the implementation, work practices and processes change, interactions with customers change, job roles and expectations
change. Active leadership from business leaders and managers is critical to the success. Leading from the front and leading by doing, are key.

Leaders shouldn't ask staff to use systems, if the leaders themselves are unwilling to use the systems.

When working on initiatives across multi-disciplinary teams, it can be difficult to know who is accountable. Apple uses the term "**Directly Responsible Individual**" (DRI) to refer to the one person with whom the buck stops on any given project, task or activity. The City could borrow this concept and terminology for its technology program and modify Executive Sponsor to Directly Responsible Individual.

Every project should be assigned a DRI who is ultimately accountable for the success of that project. So, for the implementation of the corporate HR system, while there are numerous stakeholders throughout the organization, the DRI is indisputably the HR Executive Director. Note that success of that initiative should not be measured simply by the completion of the project or implementation of the solution, it is the achievement of the desired business outcomes – reduced number of payroll errors, reduced time spent processing timesheets, ability to easily and quickly generate workforce metrics (headcount, vacancy rates, etc.) – that must be identified as part of the business case before the project starts.

The Directly Responsible Individual is responsible for providing the vision and leadership for the project. The DRI has an active/proactive role to play – not just as a figurehead sponsor of a project, but as someone who is guiding and evangelizing the realization of the business capabilities as well as eliminating the barriers that impede their achievement.

## 6.3 Digital Education and Training for Staff

Since the mid-2000's, municipalities have typically neglected technology training. Train the trainer has become the de-facto mode of delivering training because it is cheap – not because it is a good model.

At this time, no one in the organization has clear accountability for technology training, and no resources are specifically allocated to it.

The following roles and responsibilities regarding training is a model that the City could adopt, if funding and resources allow:

Area	Description	Role / Responsibility
Corporate training needs	Development of a Corporate Technology Training Requirements Analysis identifying	IT Director / Executive Director HR
	training needs across the organization.	
Technology training program design and development	Development of a training program, informed by corporate training needs requirements that reflects the delivery preferences of staff, e.g., Lynda.com, offline, self-study, lunch and learns	TT Director / Executive Director HR
Corporate Training – Standard Productivity Suites	Coordination and delivery of training around productivity suites, e.g., Office, Adobe	Coordinated by HR in partnership with IT as part of a corporate training program
New technology product	Coordination and delivery of training around productivity suites, e.g., Office, Adobe, Skype	Coordinated by project team, following training delivery standard
Business Solutions Training	Initial and ongoing training in the use of business systems	Departmental SMEs with support from vendors and project team members

In addition, the City should ensure that new staff being recruited to the City have requisite technology skills by modernizing job descriptions and ensuring that staff in key roles – such as Directors – have the modern technology and digital skills required to lead digital transformation.

One idea to consider is a concept called "reverse mentoring" – where an experienced senior staff mentors a new member of staff in business acumen and in return, the new staff mentors the senior staff in modern technology skills.

Another concept that aligns well with TeachingCity, is for the City to harness the energy and knowledge of the student body to help with digital evangelism, digital handholding and education. Using intern and placement programs, the City could use these groups to help raise the level of digital comfort and acumen within the organization.

## 6.4 Digital Savvy Network: A Community of Practice (COP)

Recognition should be given to the fact that many staff at the City, outside of IT, are either digital natives and/or are using their own savviness with technology to improve working conditions for themselves and the people within their Branch. The City should harness this energy, enthusiasm and knowledge by establishing (on a volunteer basis) a "Digital Savvy Network: Community of Practice" (COP described in more detail below).

Currently, many staff within the existing rank and file simply communicate with their peers (other, like-minded, digital savvy staff) about the prospect of using data and technology differently than it is today. Too often, many of these conversations do not get elevated beyond the supervisory level. This means that the City is missing the ability to develop, and test ideas driven from the people who may understand organizational challenges and opportunities the best.

This COP group should develop strong ties to the IT Branch to help consider the adoption of new technologies for the organization. There should also be a good connection between this network of individuals and IT governance (ITGC also discussed in detail below). This will provide better insight for leadership and provide an opportunity to recognize the efforts of those who want to use technology to ultimately improve the way the City functions.

The IT Branch should help to foster the conditions necessary to curate a Digital Knowledge COP through targeted recruitment of both IT and non-IT staff who are currently known to contribute in this space. The evolution of a COP can be fairly organic; however, growth can be accelerated by creating an ideal environment. To gain this necessary momentum, the IT Branch could identify a group, setup an initial meeting and then let active participation of members drive it forward.

Several opportunities exist to leverage this COP, but the following may be good places to start:

- Introduce and (beta) test new solutions and capabilities with the group, before broader rollout.
- Seek feedback from COP members on IT services and solutions to identify opportunities to improve the quality and experience of those services.
- Encourage (online and offline) discussion among the group on new service ideas, opportunities and needs (on things like solutions, data, process, etc.).

Encourage members to evangelize new products and services within their own peer networks and invite others to participate in the COP.

## 7. Technology Governance and Effective Delivery

With a plan to overhaul the IT Branch and become a more digital savvy organization that better reflects the City's status as a tech hub, what should the City do about:

- Improving its approach to technology decision-making
- Selecting and prioritizing initiatives
- Coordinating strategy
- Delivering selected initiatives

## 7.1 Technology Governance

The main objective of technology governance is to align technology projects with business strategies. A formal technology governance framework provides a contextually aware mechanism which can be used to make decisions and evaluate how predetermined goals and objectives are met.

A formal governance framework will provide clarity and a mandate for the right people making the right decisions about technology at the City. It should clearly identify the groups and individuals who are involved in IT decision-making and should specify which

decisions are the responsibilities of which groups. Although, clearly, IT has a central role to play with respect to decision-making, it can't (and shouldn't) do it alone.

There are several IT "framework" models that provide guidance or best practices such as COBIT, ITIL, CMMI, FAIR and so on. These methodologies are detailed, well-tested and are frequently seen driving technology savvy organizations forward. That said, strict adoption can often over-encumber organizations that are still evolving. As a result, the City should focus on the highest and most important features of these governance frameworks to employ a model that is the best fit for Oshawa. We feel that the following are the central goals of technology governance for the City:

- Developing and approving the City's Corporate IT Strategy
- Establishing and communicating technology-related policies and standards
- Determining prioritization of technology-enabled investment programs in line with the City's Strategy and priorities
- Monitoring the status of the IT portfolios and projects and resolving resource conflicts or other barriers that may be limiting their ability to succeed
- High level monitoring of the status of IT assets (e.g., hardware, software, resources)



Figure 10 IT Governance Functional Focus Areas

• High level monitoring of service levels and service improvements (e.g., SLAs, performance measurement, client outreach)

Technology governance bodies should be established to help manage decision-making and ensure the right people are at the right tables, making the right decisions. Each body (or group) should consist of representatives that have either a technical or business perspective in relation to the overall mandate of the group. It is important that governance bodies are constituted with members who do work and make business decisions as well as their counterparts in IT who do the same from a technology vantage point.

The governance model below was developed in alignment with the Information and Records Management Strategic Plan (CORP-19-101), approved in principle by the Corporate Services Committee on December 9, 2019 and later ratified by Council on December 16, 2019. Technology is inextricably linked with information and records management. As a result, broad requirements encompassing both broad areas were considered and incorporated into a model that would help the City manage the associated work in full alignment. The following is the structure approved in principle by Oshawa City Council:



Figure 11 Approved Governance Model (I&RM Plan)

Relationships between entities, particularly at the Steering Committee level, need to be defined further in support of effectively prioritizing programs of work for the City. The model below (Figure 13) as well as the subsequent section propose several new Steering Committee's which will help to provide support for key City systems and corporate technology program areas (proposed committees expand on the "Business System SCs" placeholder seen in Figure 12). Each Steering Committee should be constituted around a specific program of work, like the Information Management and Data Steering Committee (IMDSC) approved in principle as part of the I&RM plan. This is explained further below.



Figure 12 Conceptual ITGC Model

### Information Technology Governance Committee (ITGC)

The full complement of the City's Corporate Leadership Team (CLT) should also serve as the City's ITGC along with the IT Director and the IT Projects and Portfolio Manager. This will allow for the broadest oversight with respect to technology projects managed in support of organizational priorities. As an ongoing exercise, ITGC should determine other staff (IT + business) who may be required to attend meetings in support of specific agenda items. ITGC should meet as a separate and distinct entity to that of CLT to ensure a strict adherence to technology decision-making as well as: project portfolio reviews (including pilot initiatives), knowledge and capacity building (to become tech savvy), operational/service performance reporting, budget/investment analysis and so on. A sample Terms of Reference can be found in Appendix 3 below.

#### **Steering Committees**

The City should create several Steering Committees (SC) related to key programs and technology platforms used by the City. There are already existing forms of this nature in place with the GIS and IT project teams (Maximo, CityView). More work should be done to formalize these groups to ensure better frequency of meetings as well as better documentation and communication of decisions made.

SCs are responsible for determining strategies, workplans and projects (for proposal forward) 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 ITGC to ensure overall compliance with corporate strategy and to ensure optimal resource allocation. Although SCs should have some form of autonomy with respect to decision-making, they will also exist on the same level. As a result, major decisions (strategies, funding, etc.) should be recommendations to ITGC to ensure optimal coordination of projects and technology work across the City. The roles and responsibilities (and ultimately, decision-making authority) of SCs should be formally approved by ITGC to ensure clarity.

A decision needs to be made by ITGC (or CLT in partnership with the Director of IT) with respect to which SCs should be enacted and at what time. The City will also want to start small and "phase in" new committees over time. Based on our understanding of the current state, we recommend the following:

1. Information Management and Data Steering Committee

### • Approved in principle by way of the I&RM Strategy

- 2. Work/Asset Management (Maximo, Asset and Decision Support Systems, Inventory) post implementation
  - Convert/elevate current working group
- 3. Land, Property and Licensing Management (CityView, BlueBeam, CV portal) post implementation
  - Convert/elevate current working group
- 4. Geographic Information System (GIS)
  - Convert/elevate current working group
  - Leverage I&RM Strategy recommendations
- 5. Constitute a new Steering Committee with Corporate Communications as the business lead to oversee Web and Digital (including Social, Online Communications, Digital Services)
- 6. Finance and Human Resources Management (PeopleSoft, FMW, New HCM, etc.)
  - Constitute a new Steering Committee with HR and Finance as business leads
- 7. Intelligenz
  - Constitute a new Steering Committee with Recreation as business lead
- 8. Customer Relationship Management (Lagan)
  - Constitute a new Steering Committee with Service Oshawa as business lead

### **Project Teams**

Project Teams need to be driven and managed through a project charter and a defined schedule approved by ITGC (and ideally through a correlating SC). They should have a direct relationship to Steering Committees as they should be charged with completing activities in order to meet the predefined project requirements. Funded backfills for secondments of internal resources as well as contract positions may be required for some Project Teams. These considerations should be accounted for as part of an overall business case for the project.

Small scale Project Teams are also useful in delivering on technology pilots. Allocating staff (IT + business) to "test the waters" and develop prototypes or small use case deployments is an effective way for ITGC to get a sense of the overall value of surrounding initiatives which may be scaled out corporately. The use of BI and analytics to generate operational dashboards and visualizations (i.e., improve reporting) is an initiative the City should consider.

### **Working Groups**

Working Groups would operate to co-develop and test best practices, bringing forward recommendations for discussion and approval at the SC level. Working Groups can be

designed as fluid – scaling up or down in relation to a certain program of work. They should also revolve around a topic area or set of actions that need to be completed to support a substantive decision by ITGC. As a result, Working Groups may be formed in an ad hoc fashion and disbanded at the discretion of ITGC.

Where Project Teams are commonly enacted in support of work that has a beginning and an end, Working Groups may continue in perpetuity, some only activated when necessary. The City should establish a Technology Standards Working Group to establish standards endorsed by ITGC. The process should start simple and lightweight – with documentation and an agreement of existing standards, a quarterly meeting to propose and review significant planned changes and a process (communication / approval) required for smaller changes needed.

### **Communities of Practice**

Communities of Practice (COP) are informal and/or loosely defined groups and networks of people that can be critical in supporting emergent corporate disciplines such as data, systems, tools and the application of technology across the organization. Many exist without formal terms of reference and instead focus on directly managing knowledge to a key area. This knowledge is created, organized, revised, and shared between COPs. Such knowledge will be extremely valuable to help inform ITGC because it is generated and revised by people who are well attuned to "how things are currently done".

Over time, the City should establish several COPs designed to better engage staff in the growth of technology tools and processes. Given that a foundation is already there, a GIS Community of Practice is one target area – there are many technical and non-technical staff currently working to develop and consume technology in this area. COPs can empower front line staff by identifying improvements that would directly make their jobs easier and improve the overall service or process they are managing on behalf of the City. Employing these communities directly also helps to legitimize a new process or discipline (like Project Management and Data Management, for example) because they provide an opportunity for those involved to discuss how their participation contributes to real change.

Given the growing and long-term funding needs for IT, the City should conduct a review of its technology funding to determine suitable annual allocation, while also considering how appropriate reserves can be established to fund future technology investments including those arising from lifecycle replacement – particularly around major systems, such as PeopleSoft, Maximo and CityView. The Commissioner of Finance should lead this work with Commissioner of Corporate Services. CLT / ITGC should oversee this work.

As noted earlier, it is recommended that the Annual Technology Projects fund, be reallocated as an operating budget to cover increased IT staffing costs.

The City needs to focus on establishing a suitable (increased) level of investment in technology as well as funding sources to activate the value behind investments made. Such an approach must consider the shift of funding requirements from capital to

operating in support of Cloud solutions and service-based models that can free up existing resources to focus on project support and implementation.

To facilitate the increased investment and ongoing support of technology, the City should also look to alternative funding sources outside of the IT envelope. It is in the ongoing operations of technology that the City faces the toughest challenge. For every new technology implemented, new demands are placed upon the organization to support and maintain the technology. The City has used some of these options and should continue to explore and expand a range of alternative funding sources to support technology investments that have been pursued successfully by other municipalities. These include:

- **Development Charges** supporting technology investments related to growth, e.g., fire mobile technology, traffic light pre-emption, public Wi-Fi provision. Note, the City of Vaughan has made changes in its Official Plan to address the need for public Wi-Fi in City facilities.
- **Building Permit Reserve** currently used to directly fund permitting technology and indirectly fund upstream and downstream technology and process improvements that contribute to improved permit processing, e.g., planning application processing technology.
- **Gas Tax** the City has used this to fund technology projects related to Work and Asset Management.
- **Departmentally Funded Technology and Resources** e.g., in Burlington, additional corporate IT staff have been paid for from the Fire budget, providing additional resources to support Fire, but who are centrally managed and coordinated resources.
- **Grants and Challenges** e.g., Smart City Challenge, FCM Asset Management, Community Improvement.
- **Growing Revenues to Offset Technology Costs** e.g., advertising linked to digital services.
- Services Surcharges (specifically on B2B services) to fund implementation of digital services e.g., building permit or planning application 'surcharge' diverted to a fund to support the implementation of digital services that reduces costs for those using the service through, for instance, reduced plan printing and visits to City Hall.
- **Technology Levy** some municipalities have introduced a levy to fund investment in community technology. For example, the Town of Caledon has introduced a "broadband levy" to address improved internet services in their community<sup>6</sup>.

It is also recommended that the City also review and amend both the procurement and Council-Committee reporting process to ensure that the IT Director is able to sign-off on any technology recommendations put forward by individual Branches. Any associated discussions as to the overall value of these initiatives as well as the associated funding

<sup>&</sup>lt;sup>6</sup> https://www.caledon.ca/en/business/Internet.asp#broadband

implications (implementation costs, maintained support, etc.) should first be reviewed and endorsed through ITGC.

The City should ensure that the complete cost of implementing a solution is incorporated into the practice of budgeting for budget requests. There is a myriad of factors to consider when looking at budget over and above the cost to procure a solution. Most often, there are unknowns that will make this challenging, however, there are a few factors that should always be considered as part of establishing the budget in support of a project. Some of these are below:

- Product or solution purchase (based on the deployment model may either be OpEx or CapEx)
- Licensing, support and maintenance (based on the deployment model)
- Infrastructure costs (hardware, software and data prerequisites including things like interface/integration work, data migration, server/network infrastructure development, etc.)
- Preliminary work to support future growth (additional modules or functionality that *could* be added over time)
- Resourcing both from IT and the business (the City needs to fully fund secondments that are deemed necessary to support the success of certain projects)
- Training (to support implementation and the ongoing orientation for new users)
- Customization (near vanilla implementations are strongly recommended proposed customizations should be considered as early as possible through the governance framework)
- Third-party technology partners (vendors and implementation partners may be required to support certain projects)

Another major change that will have an impact on the City's technology budgets is that technology expenses are beginning to shift from capital to operating budgets. Overall, this is a very definite trend – we've seen that the technology industry, in general, has rapidly moved from a "buy" to "rent" model. Although the government has been slower to adopt this approach, vendors are now requiring their municipal customers to transition to a more fee-for-service model through the development of their solutions.

As Cloud services have popularized subscriptions, almost all IT software and services are now shifting to a subscription basis, so there is no hiding from this new business model. The City benefits from this by lower, up-front capital investments which are required to get technology up and running. But it also shifts costs to ongoing operating budgets and a potentially higher total cost of ownership.

The City must prepare financially for this transition. As subscription fees increase, IT operating expenses can be expected to increase substantially as a proportion of overall IT costs.

Capital funding will still be required to support project implementations (professional services, staffing), hardware and other technology procurement, but it is reasonable to assume that much of the City's software expenditures will gradually transition to subscription and thus operating accounts over the next 5 years.

It is recommended that the City revise its current (Information Systems Steering Committee) ISSC approach of ranking projects in order to realize a more formal Project Portfolio Management approach to selecting and executing on technology initiatives. The term "Project Portfolio" is used to refer to the collection of projects (the IT workplan) that the City is undertaking at any one time. The Project Portfolio Management approach is the methodology by which projects are proposed, evaluated, selected and executed. The goals of this approach are to:

- Define the rules by which new projects are initiated.
- Create more visibility into the status of projects, so that projects that are facing challenges and delays can be identified and addressed.
- Select fewer projects, so that scarce IT resources can be focused on the projects with the highest value and those that can be successfully delivered. Though it may be unpopular, the flip side of this approach is to eliminate low value-added technology projects that consume precious resources.
- Slow things down there is often a tendency to jump from idea to execution too quickly without appropriate due diligence. This process, combined with the proposed governance framework, has been designed to ensure that ideas get fully vetted and have key stakeholders committed before the projects are funded.

The annual capital budget cycle should continue to be the driver for the development of the annual IT workplan. Annually, in advance of the corporate budget process, the departments, including IT, will be invited to submit Project Proposals for inclusion in the overall IT Project Portfolio. Note that all technology projects must be submitted through this process. Technology projects should not be budgeted directly in departmental budgets, without approval of ITGC.

The City should more carefully consider where it invests its effort and resources. Just like any portfolio, it should spread its investments wisely. Run, Grow and Transform categories are typically used to help organizations understand and manage their technology investment effectively.



Figure 13 Gartner's Run Grow Transform (RGT) Model

A recommended ratio of projects across these portfolios is 60:20:20.

The City is, at this point in time, heavily over-indexed on Transformative type projects (e.g., Maximo and CityView), which means that Run and Grow projects are likely being deferred. Balancing the portfolio more reasonably would be prudent.

Over-committing creates unrealistic expectations, stress and poorer outcomes (a compounding effect where more and more projects are piled on to an already over-burdened team).

Looking at previous performance as a reliable predictor of future performance is a valuable yardstick of how many projects of what sizes can be achieved within a single year.

As such, we recommend that the City conduct a review of previous years and set a reasonable target of the number of projects that could be achievable in future years (based on history, this may be in the order of 15-18).

Before a project can be approved, a set of due diligence activities must be undertaken. Thus, an idea moves through multiple stages before it becomes an approved project that is ready to be scheduled and executed.

- 1. Idea: Someone (staff, manager, director) has an idea or a business problem that needs to be solved likely using technology. The idea should be discussed (with IT and business units involved), explored and fully understood before a decision is made to move forward. If, upon investigation, the idea / opportunity is valid, then it will move to the concept stage. If not, the idea will be dropped.
- 2. Concept: Once an idea has been validated, the concept is fleshed out in more detail and a concept / proposal is developed. The concept is reviewed by key stakeholders, evaluated using agreed criteria and proposed to the relevant group for approval to move forward.
- **3. Project:** A project is an approved and funded concept that is ready to be executed. A project does not begin until the required resources are available, assembled and ready to go.

IT should work with Finance and CLT to develop a suitable Business Case process to support project requests. As a component of this, there should be supporting processes that capture inputs from business cases to track the overall value (in the form of business benefits) accrued from technology-enabled projects. Regular audits should occur to gauge value in relation to projects as they are delivered. This is an excellent learning opportunity to document and use in planning future projects.

The IT Project Office residing within IT is responsible for maintaining a register of all ideas and concepts that may evolve (over time) into a project. Further work is required to develop a project intake process that follows the conceptual model (idea, concept, project) along with a clearly defined methodology (e.g., agile) with which to support the project. IT must continue to build its capacity to manage and facilitate review of the City's entire portfolio of technology-enabled projects. Project ranking and evaluation will continue to be a central focus for ITGC (as it was for ISSC) to ensure the right decisions are made in support of the City's broad strategic goals and objectives.

The IT Project Office will also need to work through requests and ITGC approvals to balance the portfolio of projects by managing the associated resources, handle projects outside of the annual budget cycle, define and implement the appropriate methodology to support the execution of projects (at the project level) and report to ITGC accordingly.

Being spread too thin across many projects at once is not effective – but it is a common challenge in IT. Indeed, Lean manufacturing best practices have established that minimizing work in progress and reducing unplanned work are keys to an efficient delivery of work and products.

The current approach to the project queue sees pressures on the IT Branch from all parts of the organization to move their project forward. This sees projects being 'pushed' onto the workplan.

Adopting the Kanban approach to working on projects that uses 3 'buckets' to categorize work (illustrated below) can be helpful in controlling and managing the flow.

This is a 'pull' system, which means that only when a project is completed and moves from the *Doing* to *Done* bucket, can a new project be selected from the *To Do* bucket and move into the *Doing* bucket. This method more realistically maps work to the capacity and capability of the organization, rather than a desired, but ultimately unrealistic, timetable.



Figure 14: Kanban based Portfolio Management

IT Architecture is one of the most important standards for the City.

At a high level, the MTMM represents the core concepts underpinning this IT Strategy. The MTMM represents a macro level blueprint – the equivalent of the Official Plan for the technology environment.

Many of the key concepts have already been discussed earlier in this document, however some additional key concepts to bear in mind include:

- Standardization and rationalization the City should endeavour to use fewer platforms and tools, fully utilizing the solutions it has in place
- The City should recognize that there are Enterprise and Expert business systems, and that differential levels of support are provided by IT for the different categories of system
  - Enterprise systems: large platforms, core business processes, designed to be reused, fully integrated with functional expertise in business units and technical support provided by IT

- Expert systems: small, workgroup-based solutions, designed for single specific uses, not integrated, functional support by departmental teams with technical 'start-up' assistance from IT
- Common corporate security standards must be defined and oversight from IT provided, with enforcement supported through IT governance

Just as the development application process is used to review compliance with the Official Plan and Zoning Bylaw, proposed technology initiatives should be reviewed against the architecture to ensure that the proposal complies with the City's plans for its technology environment.

The IT Branch will establish an IT Architecture Working Team (Managers + key IT staff) to first document existing solutions, data, and technology **<u>defaults</u>** 

- Document what technology defaults are currently in place (e.g., by defaults we mean, if given a preference would we choose SQL or Oracle database, Windows or Linux server, on-premise or Cloud software, etc.)
- Identify the key gaps where new defaults would be helpful
- Build a plan for tackling the gaps
- Approve w/ ITGC/CLT

The IT Architecture Working Group will establish a proposal-based process for <u>all</u> future amendments/changes/additions to the architecture – which applies to all parties that wish to amend the architecture (IT Managers, Project Teams, etc.).

As part of the intake process, the IT Branch is responsible for reviewing proposals and ensuring that they fit within the Architecture. Where the IT Director determines that a proposal falls outside the Architecture, the City's standards or the IT principles, it will be escalated for resolution at ITGC.

Significant revisions to the Architecture will also be brought forward for approval by ITGC upon recommendation of the IT Director.

When working on projects across multi-disciplinary teams, it can be difficult to know who is ultimately responsible. As noted previously, the notion of assigning a "**Directly Responsible Individual**" (DRI) to projects can cut down on the paradigm of deferred responsibility that can often be associated with large scale technology implementations that involve cross-functional teams. We recommend using this concept and terminology to support future Digital and Technology programs at the City.

Every project can be assigned a DRI who is ultimately accountable for the success (or failure) of that project. Success is not simply the completion of the project or implementation of the solution, it is the achievement of the desired business outcomes – improved customer experience, new capabilities, increased efficiency, improved reporting and data management, and so on.

A DRI should report directly to the highest level of IT governance and/or be a member of CLT as s/he can represent the project both from a technology and business perspective. DRIs do **not** need to be technologists. Instead, they need to have the ability to work with technology partners (IT Branch + 3<sup>rd</sup> parties) to understand what

barriers and opportunities are associated with realizing business outcomes and then translate them to their peers. An active DRI supported by a PM and project team should be able to:

- Promote engagement and collaboration on projects to ensure varying perspectives and requirements are met early on
- Help co-create the project mission and charter and reflect on it **regularly** (with big projects the 'why' can often be forgotten remind people!)
- Document roles and responsibilities and make changes as they happen
- Support project resiliency and respond calmly to setbacks and course corrections
- Translate progress across the organization and to Council and CLT
- Build frameworks and collect data to analyze project performance
- Expertly communicate and find the answers you don't have
- Be open to feedback but make decisions when the time comes to do so
- Inspire trust by leading by example (i.e., that you are driving the project)
- Think strategically but stay close to the details (task level)
- Assign new DRIs to cover the areas you can't, but ensure they report back to you as the project DRI is where the buck stops!
- Pick up loose ends and predict where resource issues, budget and performance might lead to barriers
- Be open, transparent and ready to arbitrate against competing business needs
- Leverage strategic relationships across the organization in support of the project
- Think about the future state install a framework and plan to measure success following the project
- Facilitate and document the learning from a project to help sustain continuous improvement and inform future projects.
- Given the pace of technology, it's easy to be sold on the prospect of new tools driving digital transformation. Clearly, we realize that technology plays a critical role in generating value, but technology is very ineffective without the underlying processes and people to support it. We have seen far too many technology projects fail because there wasn't an adequate amount of attention paid to people and process. Real value and a return on investment is realized when all three facets are in unison this needs to start and be maintained throughout the life of a project and following implementation. Too frequently in organizations, projects begin without an adequate understanding of what the business problem is and why it's important and why it is more important to tackle this problem rather than others.

- A combination of project management methodologies and the DRI model can help ensure that the right work is done up front to define and codify the five Why's. These questions need to be answered collectively, by those who will ultimately use, manage and consume the technology.
- People are the key here frankly, nothing will work if the resources are either unavailable or uninterested.
   People need to buy into the value in change so it's important to never lose sight of the outcomes. Change management is the driver to ensure that people are in place to support a process but, most importantly, they are also



Figure 15 Applied Organizational Change Model

motivated and empowered to do so. A change management process should be part of any major technology project to some degree. It can be as simple or as complex as a project group deems necessary, but ultimately, there needs to be pre-work completed in order to determine who and how people will be engaged throughout the engagement. This starts with selecting the right people as contributors to the project work but also should include a plan of regularly communicating the prospective changes to others outside the immediate project team. Everyone from front-line users to decision-makers within the organization need to be considered because at the end of the day, if technology is not used effectively, processes break down and people become demotivated and more likely to 'do it their own way'.

- Many suggest that any process supported by technology should also be able to function in the absence of said technology. Clearly, we *want* automation, we *want* to get away from manual paper processes, however, there is great value in this notion. By looking at a business process (or mapping one that doesn't exist) void of technology, a team can better understand the key attributes that will ultimately make it successful. Technology can enhance, automate and make life easier for the people supporting it – but it cannot automate a process that doesn't make sense, or doesn't work manually.
- In general, we recommend spending more time to set-up and position projects for success rather than racing to start and through the project. Yes, this can take more time to manage, but it's an invaluable investment that will lead to more engaged people and more refined processes that can optimally be improved by technology and automation.
- It is important to remember that projects, initiatives and solutions are developed and delivered by teams – not by Steering Committees. Thus, it is important that the City build effective product and project teams that combine business subject matter experts, project management, business analysis, and technical expertise, alongside frontline users of systems to support the execution of projects and product enhancements.

- Co-locating teams and ensuring that teams meet frequently (daily huddles, retrospectives) are proven to improve team cohesion and project outcomes. The concept of entrenching technology staff (at least for a period) within the operating areas is another deliberate decision made by many organizations to both build better relationships between IT and the business and also better define the business problems that could be solved, in part, by technology.
- Skunkworks<sup>7</sup> teams are another model that can help facilitate multi-disciplinary problem solving around real problems. Essentially, these small and loosely structured teams tend to include IT and select business partners who employ design-thinking methodologies to innovate and positively disrupt an existing or new process. It is recommended that these teams follow a PM protocol so, after problem definition, they can be almost entirely focused on prototype development and testing. These (often entirely seconded) teams need to embrace and be supported by a 'test and learn' culture as experimentation and failure is a reality of such work. If cultural change can be managed to support a skunkworks team, they can lead a re-imagining of legacy and radical transformation that is difficult to conceive of introspectively.

#### Agile

Agile is an iterative approach to project management and solution development that helps teams deliver value faster and with fewer headaches. Instead of going all in on a big bang launch, agile teams deliver work in small, but usable, increments. Requirements, plans, and results are evaluated continuously, so teams have a natural mechanism for rapid response to change.

Cities are complex – a point that can't be over-stressed. As a result, the needs around people and process are currently in flux. The agile approach recognizes that projects need to be flexible and adapt to ever-changing conditions. It also strives to ensure that work is completed through delegation of specific tasks but that collaboration through cross-functional teams (IT, business, vendor, users, etc.) is applied in support of the

<sup>&</sup>lt;sup>7</sup> https://en.wikipedia.org/wiki/Skunk\_Works

overall process. Typically, agile is employed through formal project management which seeks to optimize time and resource allocation to deliver features in sprints (versus a fully developed product based on extensive requirements gathering conducted up front). Iterative improvement cycles better engage project members as they can see their inputs immediately translated into the ongoing evolution of the product. The features, often referred to as "building blocks", are assembled over time to create the final product – Agile projects focus on building capabilities one (or a few) pieces at a time rather than all at once.



Figure 16 Agile Project Management Lifecycle

Although the overall approach within an Agile project will vary in accordance to the scope and scale of the project itself, the following characteristics are commonly present:

- There is a committed DRI or sponsor for the project who is fully accountable through some form of governance
- A Scrum Master (often, and ideally the PM) facilitates and ensures adherence to Agile principles, clears obstacles to support an ideal working environment and manages relationships/dynamics of the team
- Face-to-face (in person or remote virtual) communication is preferred
- Consistently changing requirements through the organic process of "discovery" are anticipated and accommodated
- Work is broken down into increments where individuals or teams are delegated responsibility
- Features of the product/project are delivered in sprint cycles (typically a few weeks in length) eventually culminating in completion of the project
- Stand-ups/daily check-in meetings occur to ensure all are on the same page
- An emphasis is given to adaptation over the short term versus planning over the long term

Although Agile is often applied through formal project management, the associated notions of iteration, collaboration and adaptability can be applied more generally to City work – especially in the technology area. The concept of "fail fast" from a systems-design perspective, emphasizes the need to invest energy to build and test something in order to determine its overall value. Testing prototypes with real-world scenarios is often far more valuable in ascertaining true value as it provides better insight into the actual conditions into which the product would be launched (contextual opportunities and constraints). This insight allows practitioners to learn what worked and what didn't and then leverage that knowledge in support of further improvement cycles.



In order to "fail fast" and "be agile", the City needs to embrace a "test and learn culture" – something that requires dedicated commitment from the top down. It also takes time to shift away from more traditional modes of working. ITGC can become an ideal platform to recognize and share success stories, develop approaches and guidelines as well as monitor the overall progress of Agile as a growing discipline within the City.

We would encourage the City to incorporate Agile techniques into its project management toolkit and use them to inform the way it approaches projects. Specifically, applying the minimum viable product approach, using an iterative solution delivery approach, breaking larger deliverables into shorter sprints, actively involving the user, showing concepts not explaining concepts, and co-locating project teams are key factors that the City should be utilizing.

## 8. Work Plan and Anticipated Budget Impacts

## **8.1 Sequencing Major Initiatives**

As we have noted throughout this Strategy, there are a number of very large, corporate-wide change initiatives that must be tackled – each of which will deliver significant and tangible efficiency benefits.

Because of these potential benefits there is an understandable desire to move forward on many fronts. However, these initiatives are resource and change intensive, and the City's staff and culture can only withstand so much change at one time.

Thus, it is recommended that the City only tackle one major enterprise-grade transformation project at a time. Thus, the workplan proposed suggests that first Maximo, then CityView, then HCM, and then ECM be tackled – in this order. Only when the previous initiative is substantially complete should work begin on the next major enterprise initiative.

### 8.2 Workplan Summary

The following table provides a summary of the major programs of work throughout the life of this Strategy. Refer to Appendix A for more complete project information, timelines and estimated budget needs.

2020	Solid Utility and Trusted Supplier Build Out					
	<ul> <li>Governance <ul> <li>Setup of ITGC and Steering Committees begins</li> <li>IT investment/spending review with Finance</li> <li>Policy framework and policy development</li> <li>Business case process formalized</li> </ul> </li> <li>Organization <ul> <li>Capital project funding for contract resources to support approved projects</li> </ul> </li> </ul>					
	Business Systems         • Maximo implementation         • CityView implementation         • Tax system replacement         • Meeting Management implementation         • CRM upgrade         • Officer enhancements         • GIS Upgrade					
	<ul> <li>Infrastructure</li> <li>Mobile technology platform begins</li> <li>Office 365 investigation begins</li> <li>Next-Gen 911 begins</li> </ul>					
	<ul><li>Customer Facing</li><li>Open data expansion</li></ul>					

2021	Solid Utility Achievement, Trusted Supplier Build Out					
	<ul> <li>Governance</li> <li>Policy development (Cloud, data backups, mobility)</li> <li>Governance reconstitution concludes (Steering Committee setup)</li> <li>Business Continuity Planning</li> </ul>					
	<ul> <li>Organization <ul> <li>Vendor of record for key IT resources (on-demand)</li> <li>Training, education and leadership development</li> <li>Add Client Services Manager position</li> <li>Add Senior Systems Analyst (Maximo) position</li> <li>Add Fire IT Specialist position</li> <li>IT Co-op program expansion</li> <li>Capital project funding for contract resources to support approved projects (secondments and contract project management)</li> </ul> </li> </ul>					
	<ul> <li>ITS</li> <li>IT annual report on IT Strategy progress (annual)</li> <li>Process development (ITSM, incident/problem/change management)</li> <li>IT performance management program (baseline measurement reported through IT annual report)</li> <li>Out-of-hours service introduced</li> </ul>					
	<ul> <li>Business Systems</li> <li>Maximo implementation (continues)</li> <li>CityView implementation (continues)</li> <li>Tax system replacement (continues)</li> <li>Road patrol implementation</li> <li>PeopleSoft Finance review and roadmap</li> <li>Meeting Management implementation</li> </ul>					
	<ul> <li>Infrastructure</li> <li>Office 365 implementation begins</li> <li>Mobile technology platform implementation</li> <li>Technology roadmaps work begins</li> <li>Disaster Recovery Strategy</li> <li>Managed security services partner</li> <li>Next-Gen 911 (continues)</li> </ul>					
	<ul> <li>Customer Facing</li> <li>Online building permits, digital drawings, business licenses</li> </ul>					

2022	Solid Utility Achievement, Trusted Supplier Progression							
	Disaster Recovery policy (corporate adoption/rollout)							
	Organization							
	<ul> <li>Add Manager GIS and Data Services position</li> </ul>							
	Add Infrastructure Analyst position							
	<ul> <li>Capital project funding for contract resources to support approved projects (secondments and contract project management)</li> </ul>							
	ITS							
	<ul> <li>IT performance management review (reported through IT annual report)</li> </ul>							
	Business Systems							
	<ul> <li>Asset Management systems (decision support, modeling) project begins</li> </ul>							
	<ul> <li>Continued evolution assessments and plans for key business systems</li> </ul>							
	Corporate project management solution implementation							
	HCM implementation begins							
	Infrastructure							
	Mobile technology platform implementation							
	Next-Gen 911 completed     Disaster Deservoir implementation haging							
	Disaster Recovery implementation begins							
	Intelligence and Data							
	Corporate GIS and Data Strategy							
	Data warehouse implementation							
	BI platform and standards development begins     Digital sorvices expansion readman development							

2023	Solid Utility, Trusted Supplier Progression, Partner Journey Begins						
	<ul> <li>Organization <ul> <li>Transition of IT Director to CIO begins</li> <li>Add Asset Control and Mobility Support Specialist position</li> <li>Add Senior Systems Analyst (CityView and ECM)</li> <li>Add GIS co-op program</li> <li>Capital project funding for contract resources to support approved projects (secondments and contract project management)</li> </ul> </li> </ul>						
	<ul> <li>Business Systems</li> <li>Asset Management system (decision support, modeling) implementation</li> <li>Enterprise Content Management solution project begins</li> </ul>						
	Infrastructure <ul> <li>Disaster Recovery implementation</li> </ul> Intelligence and Data						
2024	BI standards development adoption Trusted Supplier Partner Journey Progression						
	<ul><li>Governance</li><li>Review of governance framework</li></ul>						
	<ul> <li>Organization</li> <li>Transition of IT Director to CIO concludes</li> <li>Add IT Project Manager position</li> <li>Develop Co-op Program – GIS and Data</li> </ul>						
	<ul> <li>Business Systems</li> <li>Enterprise Content Management solution project implementation</li> </ul>						

### **5.6 Anticipated Future Budget Impacts**

Individual high-level budget estimates (based on the consultant's industry experience) for software and hardware purchases, subscriptions, project and operational staffing, contract staffing and professional services for the work identified in the Strategy are included in the detailed workplan in Appendix 2.

Please note that a number of items cannot be properly estimated at this time, without more detailed investigation – so a number of items are marked as TBD

Estimates indicate a requirement for additional investment, where the estimates are known, of approximately \$4 million in capital expenditures over the next 5 years, with an additional \$2 million anticipated in operating budget impacts. These estimates do not include the lifecycle costs for IT infrastructure already identified in the 10-year capital plan.

Once additional details are known for key projects, the costs are expected to be substantially higher.

Based on currently known estimates, this breaks down into the following non-cumulative annual impacts:

Year	Annual Operating Impact	Annual Capital Impact			
2020	500,000	1,695,000			
	Approved in 2020 budget	Approved in 2020 budget			
2021	637,500	600,000			
2022	1,050,000	1,350,00			
2023	410,000	2,055,000			
2024	TBD	TBD			

Note also the earlier discussion about the intent to re-allocate up to \$400,000 existing ATP funding to support staffing growth within the IT Division, which would contribute to covering the operating costs in 2021.

Budget and staffing requests to support the increased investment outlined in this strategy will come forward to Council as part of future annual budget processes. Thus approval of this strategy is intended to set strategic direction – not the approval of budget allocations.

# 9. Measuring Strategy Progress

Follow through on strategy is critical so it is key to keep the Corporate IT Strategy in focus and front of mind for leadership and tracking progress against strategy goals.

## 9.1 Annual Strategy Check-In and Annual Report

The Corporate IT Strategy workplan (detailed in Section 8 and Appendix 2) identifies specific actions year-by-year which should be tracked by IT Management as part of the IT Strategy Portfolio (in Eclipse) and should be visible to IT Management and staff, as well as leadership and staff across the organization. ITGC should monitor progress quarterly.

Additionally, a review (and report) upon Strategy progress, which may be externally facilitated, should be conducted annually.

IT should develop a simple annual report format that quickly and visually communicates to City staff what has been achieved in the previous year. It is important that Council and staff better understand how information technology is linked to the efficiency and effectiveness of the organization. The organization must be kept better informed about the overall roadmap, and better educated on how specific initiatives will contribute to improved outcomes for staff and customers.

As part of the first report, IT needs to develop metrics that illustrate overall progress in critical areas. Service delivery (ITSM), project portfolio management, software and infrastructure capabilities, technology procurement, budget (cost savings and avoidance, etc.), cybersecurity, usage statistics (licensing, training, etc.) and resourcing are all areas to consider. ITGC should endorse the performance measures and each annual plan to ensure that it can convey overall progress of IT to both staff and Council.



IT Value Report Fiscal Year (FY) 2015







Figure 17 Example (Palo Alto) performance dashboard

Investment Year of F1

FY 2013

FY 2014 FY 2015







Investment Maintenance

100

## 9.2 KPIs

Meaningful measures should be chosen to reflect performance within, and outside, of IT against strategic targets. The following are recommended as KPIs for the IT Management Team and ITGC to monitor going forward. Initially, reporting on all of these measures will not be possible – but building the mechanisms to report in these areas is key to monitoring progress and success.

Area	Measure	Description				
IT Services	Staff satisfaction with IT services	Monitor levels of satisfaction with IT services, expecting to see increased levels of satisfaction with services associated with corresponding changes to services and approach				
	Management satisfaction with IT services (survey)	Same as above				
	# of technology projects completed	To track throughput of projects. The goal is to increase the number of projects being delivered along with increasing the quality of delivery				
	# of education / training sessions	Track the number of digital / education units delivered / received by staff				
Process Digitization	% of internal processes that are digitized by business unit	To monitor the proportion of business processes per business unit that have been completely digitized				
	# of employee self-service transactions (HCM; Finance Systems)	To monitor uptake of self-service transactions in the HR and Finance systems				
	# of self-service mapping sessions	To monitor the adoption of self-service mapping and data analytics				
Mobile Working	# of mobile-enabled staff	To monitor and demonstrate growth in the mobile working group				
	% of mobile workers who are actively using mobile technology	To monitor active use of tools by mobile workers				
Digital Services	# of online / digital services offered by the City	To monitor the expansion of online services				
	% of City services offered that are digital/online	To monitor growth in digital / online service availability as a proportion of the total service portfolio				
	# of online transactions per quarter	To monitor overall uptake of the digital service channel				
	Staff satisfaction with collaboration capabilities	To monitor staff satisfaction with new/modern collaboration capabilities provided				
O . Walk and the r	# of digital meeting sessions	To monitor uptake of modern 'digital meeting' capabilities				
Tools	% of device fleet that is a laptop or tablet vs. desktop	To monitor the availability to staff with modern, mobile collaboration capabilities				
	% of staff who are equipped to work from home	To monitor availability of flexible working options				
	# of staff days worked at home per quarter	To monitor uptake of flexible working options				

Area	Measure	Description					
Data Management	% of data decisions made (with governed data)	To assess data governance with respect to decision-making through ITGC (can be a simple 'yes' for each decision made affecting data providing a baseline for decisions made over time)					
	% of project portfolios filled with required data elements	To assess data governance as it relates to data consideration/work through technology projects in accordance to standards and rules					
	% / # of business processes that utilize data standards (by subject area) with governed data	To account for the number of data issues that occur, specifically in relation to data conforming to business rules and policies					
	# of delays due to data integrity issues with governed data	To monitor data issues as they relate to project/initiative delays					
	% of data errors with governed data	To assess data quality, specifically as it relates to missing, incomplete or redundant entries (e.g., quantify the number of empty fields within a data set and assess along with growth of data)					
	Data storage costs	To assess data quality as it relates to the comparison of data growth rates and costs for storage (costs which are escalating above data growth indicates potential quality issues)					
Value	Business Value	A compilation of business benefits projected and realized as a result of solutions / technology / business transformation work					

Figure 18 Sample metrics to support performance management

# **10. Conclusion and Recommendations**

The combination of people, process and technology has the potential to power broad organizational productivity and efficiency enhancements across the City. Perhaps more important, the application of digital technology can drive significant customer experience improvements, making interacting with the City easier and more pleasant.

But, to achieve these outcomes, the conditions must be right – and today those conditions are hindering the City's ability to leverage technology to be as effective and efficient as it could be.

This Strategy outlines recommendations specifically designed to create a more conducive environment in which the City can ensure that the investments it makes in new technology can be successfully implemented and adopted and that the investments achieve the expected returns on investment in reasonable timeframes.

The recommendations represent a significant course change and major investments in staffing and technology. As a result, implementation of these recommendations requires active engagement and sponsorship from CLT, support from Council, and active involvement of leaders and staff across the City. The IT Management team will also own and drive many improvements within the IT Branch.

The key overarching recommendations regarding how the City approaches technology are that:

- 1. Establish a new integrated information and technology governance program, with CLT taking lead accountability for technology prioritization and investment and overseeing the delivery of the Corporate IT Strategy.
- Commit to fully costing and budgeting for the total project implementation and operating costs of technology projects (the Total Cost of Ownership), including capitalizing technology project resourcing (for IT and business unit staff) by bundling project resourcing as part of capital projects, and ensuring that operating impacts of new solutions are budgeted through the annual budget process.
- 3. Reallocate the existing Annual Technology Projects (ATP) fund to address immediate IT staffing needs, progressively investing in additional IT staffing to achieve a target of 4% IT staffing rate of total staffing by 2024 (to 30 FTEs from the current 23 FTEs).
- 4. Establish, support and reinforce a clear mandate and role for the IT Branch, alongside holding business leaders and business units accountable for the delivery of service improvements powered by technology.
- 5. Lead a reorganization of the IT Branch following recommended best practices outlined within this Strategy, working in collaboration with IT Branch members.

- 6. Invest in Digital Education for its leaders (CLT, Directors, Council) and staff to help the organization become more tech savvy and better primed to take advantage of new and emerging digital opportunities.
- 7. Report annually to Council on progress against the Corporate IT Strategy, at the mid-point between budgets.

Investments in digital technology, when done right, can deliver tremendous efficiency gains and radically improved customer experiences.

When done poorly, they are often not fully implemented, cause frustration, reduce staff morale, and can often create more inflexibility and lead to increased inefficiency, rather than the hoped-for efficiencies.

The City needs to be better positioned so that it can achieve the former outcome not the latter. Successive reviews and audits of the state of IT at the City have indicated a need for change. This Strategy is designed to bring about necessary changes and in doing so, set the City up for success in delivering great digital customer and staff experiences.

# **Appendix 1: Glossary of Terms**

While this report is written in as plain language as possible, a handful of technical terms and acronyms are used. This glossary is provided to help the reader understand the terms used.

Agile: Agile is an iterative approach to project management and solution development

AV (Anti-Virus): Software to protect from virus infection

AVL (Automated Vehicle Location): GPS-based tracking of vehicles

**Back-Office:** An office or department where work is carried out to support the business of an organization, rather than being customer facing

**BI (Business Intelligence):** This refers to technologies, applications and practices for the collection, integration, analysis and reporting of business information, and is designed to support better business decision-making

**BIA:** Business Impact Assessment – an assessment that considers the potential impact of a disaster situation or loss of service on business operations

CityView: The City's Permits, Planning and Licensing solution

**CIO:** Chief Information Officer

**Cloud:** A general term for systems and data that are not located on the organization's premises. Access to these systems and data is achieved through the Internet

**COP:** Community of Practice

**CRM:** Customer Relationship Management system – a generic system for case management that can be used for handling customer enquiries

**Digital:** This term refers to a mindset, mode of operating, and delivery of services that takes advantage of modern technologies (web, app, social, mobile, data). These deliver improved experiences, business efficiencies and insights

**Digitized:** This term means the automation of manual and paper-based processes, enabled by the digitization of information and workflows, moving from an analog (often paper-based) process to a computerized process

**DR/BC (Disaster Recovery/Business Continuity):** A set of policies, procedures and practices that are designed to assist an organization recover from a significant IT failure

**DRI:** The Directly Responsible Individual – the person ultimately accountable for a service, a product or a project.

**ECM:** Enterprise Content Management system – designed to provide enterprise-wide document and record management capabilities

**ERP (Enterprise Resource Planning):** A system that is designed to address business requirements across the whole organization (JD Edwards, for example)

**GIS (Geographical Information Systems):** Systems designed to capture and report on all types of geographical data, including spatial data

**HCM:** Human Capital Management System – corporate wide system for managing the workforce and workforce management processes such as employee records, payroll, etc.

**Infrastructure Architecture:** The hardware, software and other systems that comprise an organization's technology assets used to deliver IT services

**ITIL (Information Technology Infrastructure Library):** A set of detailed practices for delivering IT services

**ITGC (Information and Technology Governance Committee):** Corporate governance committee for information and technology decision-making

**ITSM (Information Technology Service Management):** The standards and processes used to define how IT delivers services

LAN (Local Area Network): Internal private connectivity between City facilities and devices

Land Management System (LM): The City's land, planning, permitting and licensing system (CityView)

Maximo: The City's Work Management system

**MTMM**: Municipal Technology Maturity Model – Perry Group's generalized maturity model used for assessing municipal technology environments

**NG-911 (Next Generation 911):** modernized networks and capabilities for Canada's 911 systems

PeopleSoft: The City's Finance and HR system

**PMO (Project Management Office):** A group that defines and maintains project management standards for an organization (PMO-Lite is a less onerous version that still allows standards but is not as formal)

**PPM (Project Portfolio Management):** The centralized management of all projects, potential and existing, to facilitate resource management, project delivery and status reporting

**RPO (Recovery Point Objective):** Refers to the amount of data at risk (that could be lost)

**RTO (Recovery Time Objective):** The maximum tolerable length of time that a computer, system, network, or application can be down after a failure or disaster occurs

**SLA (Service Level Agreement):** Documented target levels of service (e.g., response and resolution timelines for incidents)

**SAN (Storage Area Network):** A dedicated high-speed device that interconnects and presents shared pools of storage devices to multiple servers

**VOIP Voice over Internet Protocol:** Modern telephony systems sharing computer networks

WAN (Wide Area Network): Connectivity to the Internet

WMS (Work Management System): The City's Work Management System (Maximo)

# **Appendix 2: Detailed Workplan**

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
1	Gov	Technology operating and capital budget - investment / spending review	Conduct an IT funding review and determine strategy for establishing a suitable (increased) level of investment in technology and funding sources to enable that increased investment. Includes anticipating move from Capital to operating funding caused by subscriptions, ability to capitalize resources delivering projects.	Comm. Fin	Comm. Fin	IT Dir.	-	-	x				
2	Gov	IT sign-off on all items related to technology going forward to CLT and/or Council	Amend Council and CLT reports to ensure that the IT Director reviews and signs- off on any technology recommendations (included as part of other projects) going forward from business units to CLT or Council. Similar to Legal and Financial comments, include IT comments.	CAO	Comm. Corpora te Services	CLT, Clerks	-	-	x				
3	Gov	Re-establish ITGC (Information and Technology Governance Committee)	Set up new ITGC with recommended membership, terms of reference defined, meetings scheduled and operational. Focus on making this an action meeting - reviews by exception, clear actions identified.	CAO	IT Dir.	IT Dir. / Comm. Corporate Services	-	-	x				
ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
----	-----	--	--	--------------------------------	---------	---	-----	------	------	------	------	------	------
4	Gov	Adopt requirement for complete capitalization of technology project funding (capitalize full implementati on costs and capture future operating costs)	Develop a guideline to be approved by ITGC to ensure that the complete cost of implementing a solution (including capital costs of staffing, services, product and hardware, as well as operating costs have been accurately and completely identified) is incorporated into the practice of budgeting for capital budget requests. Establish with HR the ability to contract in staff on 1 year or longer basis to support project delivery.	Comm. Finance, IT Dir.	IT Dir.	Comm. Corporate Services, HR, Finance	-	-	x	×	x	x	×
5	Gov	Review and re-set future technology intake and selection process	Work with ITGC to set technology (web, technology, business solution, GIS) project intake process. Use idea, concept, project processes. Use portfolio concept to assist with investment prioritization. Change intake / budget forms to ensure that project staffing costs and contract staffing costs, including backfilling staff resources from business units and IT are defined.	Comm. Corporate Services	IT Dir.	IT Projects and Portfolio Mgr	-	-	x	x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
6	Gov	Develop Business Case process that supports the technology intake process	Ensure that clearly defined business outcomes are captured as part of project justification. Work with Finance and CLT to develop suitable Business Case process to support project requests (linked to budget thresholds). This is key to effectively capture and communicate to Council the "value" that is being secured. Develop in 2020 for use in 2021 budget process.	Comm. Fin	IT Dir.	CLT, Comm. Finance	-	-	x				
7	Gov	Benefits realization program: Tracking	Implement a process that captures inputs from business cases and projects to track the value (in the form of business benefits) that is being accrued from investments in technology. This will allow CLT to better articulate the value being gained from the investments in technology.	Comm. Corporate Services	IT Dir.	Mgr., Projects	-	-		x	×	x	×
8	Gov	Benefits realization program: Realization	Building on the benefits tracking program, institute an extension of the program to audit and ensure that projects realized the proposed benefits.	Comm. Fin, Audit	IT Dir.	IT Dir., Business Units	-	-				x	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
9	Gov	Review and set project approach / best practices	Work with ITGC to agree project management best practices (resourcing, stages, activities) to be employed in technology projects going forward. Document and follow – report on an exception basis to ITGC.	Comm. Corporate Services	IT Dir.	IT Projects and Portfolio Mgr	-	-	x	x			
10	Gov	IT Strategy – IT Annual Report	Provide an annual report (starting in 2021) for CLT and Council; to be provided by IT Director, Commissioner of Corporate Services and CAO to report on IT Strategy implementation progress and progress against success measures identified for the strategy.	IT Dir.	IT Dir.	IT Mgr.'s	-	-		x	x	x	x
11	Gov	Finance and HRIS (ERP) Steering Committee	Establish a joint working team to oversee planned HR / Finance roadmaps and projects and the important integration between both and the planned evolution of solutions	IT Dir.	HR and Finance Dir.	IT Dir.	-	-	x				
12	Gov	Information and Data Management Steering Committee	Establish a joint working team, with Clerks, IT staff and business unit representatives to coordinate the Information and Data programs, with an initial focus on the ECM workplan and priorities	IT Dir.	IT Dir., City Clerk	Records Mgr., Business Units, IT Mgr.'s	-	-		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
13	Gov	GIS Steering Committee	Review existing membership of GIS Steering Committee and transition into operating as a GIS Steering Committee - responsible for overseeing the development of the GIS Strategy	IT Dir.	TBD	TBD	-	-	x				
14	Gov	Web and Digital Steering Committee	Formally establish a joint Steering Committee to coordinate the Web and Digital work plan (likely evolving from the current Forms Committee)	IT Dir.	Corpora te Comms	Business Unit Reps	-	-	x				
15	Gov	Asset/Work Management Steering Committee	Evolve existing Maximo Steering Committee into a joint working team around Asset and Work Management, with PW, Parks, Engineering and AM	Comm. Communit y Services	IT Dir.	Business Unit Reps	-	-		х			
16	Gov	Land Management System Steering Committee	Evolve existing Cityview Steering Committee into a joint working team around Land Management processes	Comm. Corporate Services & Comm. Dev Services	IT Dir.	Business Unit Reps	-	-			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
17	Gov	Technology Standards Team	Establish a team (staffed by the IT Management team and experts from within IT) to support the development of Architectures, to set standards (defaults) that are recommended forward to ITGC for endorsement. Process should start simple and lightweight – with documentation and an agreement of existing standards, a quarterly meeting to propose and review significant planned changes and a process (communication / approval) required for smaller changes required by the Technology Standards Team before implementation.	IT Dir.	IT Dir.	IT Mgr.'s	-	-		×	×		
18	Gov	Architecture – Data, Application and Technology	Secure consulting services to help document existing standards and establish corporate technology, data and application architectures to guide future decision making. Ideas, concepts and projects must align with standards and architectures defined; if not an escalation for an exception is required to ITGC for authorization to deviate from the standard.	IT Dir.	IT Dir.	IT Mgr.'s	-	100,000		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
19	Gov	Establish IT Policy Framework and Policy Needs	Secure external consulting support to assist in the preparation of an IT Policy Framework as well as individual policies (identified separately). Review with ITGC the proposed IT policy framework and bring forward individual policies for approval and implementation.	IT Dir.	IT Dir.	HR, Finance, CLT, IT Mgr.'s	-	50,000		x	x		
20	Gov	Acceptable Use of Technology Policy	Update/revise or rewrite Acceptable Use policy, get approval, communicate and implement	IT Dir.	IT Dir.	IT Mgr.'s, HR, CLT	-	-	x	х			
21	Gov	Information Security Policy	Create updated Information Security Policy, get approval, communicate and implement	IT Dir.	Mgr., IT Infrastru cture & Security	Legal, Risk	-	-	х	X			
22	Gov	IT Governance Policy	Create a policy documenting how technology decisions are taken, standards defined	IT Dir.	IT Dir.	IT Mgr.'s	-	-	х	х			
23	Gov	Mobility Policy	Update/revise or rewrite Mobility policy ensuring appropriate distribution of smart / mobile devices to the staff that need them, get approval, communicate and implement	IT Dir.	IT Dir.	HR, IT Mgr.'s, Finance	-	-		x			
24	Gov	Cloud Computing Policy	After cloud strategy has been established, enshrine in policy the steps and due diligence required before implementing cloud solutions.	IT Dir.	IT Dir.	IT Mgr.'s, Legal, Clerks, Finance	-	-			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
25	Gov	Backups/Rest ores Policy	Ensure existing policy and procedures are documented and understood by departments and CLT, review and revise as necessary	IT Dir.	Mgr., IT Infrastru cture & Security		-	-		х			
26	Gov	Disaster Recovery Policy	After BCP and DR strategy is complete, enshrine in policy the DR requirements (incorporates KPMG audit recommendations)	IT Dir.	Mgr., IT Infrastru cture & Security		-	-			x		
27	Gov	Be agile and Fail Fast	Curate, monitor and acknowledge opportunities/projects which subscribe to agile methodology and/or principles. Identify project opportunities through ITGC project portfolio reviews.	IT Dir.	ITGC	IT Projects and Portfolio Mgr	-	-	×	x	x	x	×
28	Gov	Governance Framework Development - Contracted Resources	Support from an external consultant to support the implementation and operation of an effective governance program	IT Dir.	ITGC		-	30,000		х			
29	Gov	Technology strategy progress check-up	Use external consulting resources to provide an independent annual IT strategy progress checkup to independently report on IT strategy progress	IT Dir.	ITGC	IT Mgr.'s	7,500	-		х	x	х	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
30	Gov	Governance Framework Review	Undertake a review of the governance framework and make adjustments in support of more strategic decision- making regarding technology (e.g. renewed terms of reference/mandates, membership renewal, community participation etc.)	IT Dir.	ITGC		-	-			x		x
31	Org	Reallocate ATP budget to operating budget	Re-allocate existing ATP funding to operating budget to address staffing shortfalls in the IT Branch. Future technology projects requiring funding should be handled through the capital budget process.	CAO	IT Dir.	IT Dir., Procurem ent, HR	-	-		x	x	x	×
32	Org	Establish roster or Vendor of Record (VOR) arrangements for technology resourcing on-demand	Establish procurement vehicles (multi-year roster arrangements) for securing resources on-demand - areas such as Network, Technology Management, Security, Project Management, Business Analyst)	IT Dir.	IT Dir.	Purchasin g, HR	-	-		x			x
33	Org	Co-op Program - IT	Expand existing 1 term co- op to a full-term Co-op program to help staff the IT Service Desk function. \$15k currently funded, additional 30k p.a. required. Going forward, 45k required annually.	IT Dir.	IT Dir.	Mgr., Client Services	30,000	-		х	x	x	×

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
34	Org	Co-op Program – GIS & Data	Establish a new full-term co- op program to support the GIS and Data function.	IT Dir.	IT Dir.	Mgr., Business Solutions	45,000	-				x	x
35	Org	Implement time-tracking in IT Branch	To help City leadership understand IT resource availability and avoid over- commitment – the City must more effectively track time and then. Actively manage where IT staff spend their time. IT may be possible to use existing solutions (such as Eclipse) for this purpose.	IT Dir.	IT Dir.	IT Mgr.'s	10,000	-		x			
36	Org	Hire IT Client Services, Manager	As per proposed strategy – to build out the Solid Utility capability of the team and to free up the Infrastructure team from frequent interruptions and lead a range of IT Service improvements	IT Dir.	IT Dir.	HR	150,000	-		x			
38	Org	Contract resources - 2021	Hire contract resources required to support project delivery in 2021	IT Dir.	IT Projects and Portfolio Mgr.	HR	-	TBD		x			
39	Org	Contract resources - 2022	Hire contract resources required to support project delivery in 2022	IT Dir.	IT Projects and Portfolio Mgr.	HR	-	TBD			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
40	Org	Contract resources - 2023	Hire contract resources required to support project delivery in 2023	IT Dir.	IT Projects and Portfolio Mgr.	HR	-	TBD				x	
41	Org	Contract resources - 2024	Hire contract resources required to support project delivery in 2024	IT Dir.	IT Projects and Portfolio Mgr.	HR	-	TBD					x
42	Org	Hire Senior Solutions Analyst - Maximo	Position required to support Maximo, following project completion	IT Dir.	Mgr., Busines s Solution s	HR	110,000	-		x			
43	Org	Hire Senior Solutions Analyst - Cityview/EC M	Position required to support CityView and ECM products, following project completion	IT Dir.	Mgr., Busines s Solution s	HR	110,000	-			x		
44	Org	Hire Fire IT Specialist	Position required to provide dedicated IT support to Fire Services and partners	IT Dir.	Mgr., Infrastru cture Services	HR	90,000	-		x			
45	Org	Hire Infrastructure Analyst	Position required to support expanding cloud technology environment	IT Dir.	Mgr., Infrastru cture Services	HR	110,000	-			x		
46	Org	Hire Manager GIS and Data Services	Anticipated position required to support the expansion into Data service and expansion of GIS services	IT Dir.	IT Dir.	HR	150,000	-			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
47	Org	Hire Asset Control and Mobility Support specialist	Position required to support major expansion of mobile devices used by field workers as part of Cityview and Maximo projects	IT Dir.	Mgr., Client Services	HR	90,000	-				х	
48	Org	IT Director to CIO Role	With anticipated service improvements in IT, the expectation is that the City should transition to a Partner Player. At this time a CIO role, in place of the IT Director role, would be beneficial for the organization	Comm. Corporate Services	Comm. Corpora te Services	CLT	25,000	-				x	x
49	Org	IT Management mentoring program	Establish and operate an external mentoring program for IT Managers to help mentees develop and grow their management skills and capabilities to provide independent feedback and an environment in which to share and seek input from external mentors.	IT Dir.	IT Dir.	HR	-	30,000			x	x	
50	Org	IT Management Training program	Invest in management training for IT Management Team members to develop management and technology leadership skills	IT Dir.	IT Dir.	HR	-	20,000		х	x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
51	Org	Increase funding for IT Staff Training Program (Technical Training)	Increase existing budget for technology training in IT Branch to support investments required in an ongoing program to evolve and modernize IT staff skills - particularly with regard to Cloud adoption, data services, etc.	IT Dir.	IT Dir.	IT Mgr.'s	20,000	-			x	x	x
52	Org	IT Branch - Team Building	External facilitation to work on developing a strong team mindset, ethos and approach within the IT Branch – specifically work on breaking down barriers between teams and building strong team commitment. Alternative approach could be to work with HR department to facilitate the same.	IT Dir.	IT Dir.	IT Mgr.'s, HR	-	20,000		x	×		
53	Org	Digital Savvy Network	Establish a group (through identification and by actively seeking volunteers) to participate in a Digital Savvy group to advise and provide input on the modernization of IT services and solutions.	IT Dir.	Client Services Mgr.	IT Mgr.'s	-	-		x			
54	Org	Digital Education Program – Council	Digital education program (ride-alongs, site visits, presentations) for Council to communicate how integral to City operations technology has become and will be in future.	Comm. Corporate Services	IT Dir.	CLT	-	-		x	x	x	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
55	Org	Digital Education Program – Leadership and Management	Digital education program (externally facilitated) for leadership team to increase level of digital awareness, readiness for change and to equip them with the knowledge of how to effectively drive out technology enabled transformation	IT Dir.	IT Dir.	CLT and CLTD	-	60,000		x	x	x	
56	Org	Workforce Skills and Capabilities Assessment for IT Staff	Establish baseline requirements and conduct assessment to identify current skill levels (build skills matrix) and identify development opportunities - as input to training and development program	IT Dir.	IT Dir.	HR	-	20,000			x		×
57	Org	Professional Skills Development Program for IT Staff	Based on skills matrix and to satisfy professional requirements, create an ongoing professional development program.	IT Dir.	IT Dir.	HR	20,000	-			х	х	x
58	ITS	Communicate IT Strategy to the corporation	IT Director to work with Communications Division to develop a communications plan for the Technology Strategy, and ongoing communications around events, future plans and change initiatives	IT Dir.	IT Dir.	Comms	-	-	x	x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
59	ITS	IT Service Reviews	Establish a Director level regular (6 times a year) review process with each Director and business unit leads led by the IT Director to review work plans, IT service performance, issues, opportunities and anticipated projects	IT Dir.	IT Dir.	IT Mgr.'s	-	-	x	x	x	x	x
60	ITS	Define required IT Management KPI's and operationaliz e	Operationalize (and automate) the compilation and reporting of key performance management metrics for the IT Service (based on existing KPI's developed as part of audit requirements). Use dashboards to share performance with management and team. Visibly display metrics within the IT branch space.	IT Dir.	Mgr., Client Services	IT Dir., IT Mgr.'s	_	-		x	×		
61	ITS	Agile methodology training	Train IT leadership on Agile fundamentals - allowing the team to understand where and how to apply these important concepts	IT Dir.	IT Dir.	IT Projects and Portfolio Mgr	-	10,000			x		
62	ITS	ITIL Training	Comprehensive ITIL training for the IT Branch to lay the foundation for adoption of improved IT Service Management processes, start with IT Management team and roll out to the whole team.	IT Dir.	Mgr., Client Services	IT Dir., IT Mgr.'s	-	25,000		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
63	ITS	IT service management tools	Replacement of the City's existing ITSM solution "Spiceworks" with a robust, modern solution that can manage service desk and work processes across the department.	IT Dir.	Mgr., Client Services	IT Mgr.'s and staff	40,000	50,000		x	x		
64	ITS	Incident management processes	Formalize incident management handling processes; work with business units to define target service levels (classification of issue and urgency, response and resolution timelines) digitize into ITSM solution, develop reporting to monitor against targets	IT Dir.	Mgr., Client Services	IT Mgr.'s and staff	-	-		x	x		
65	ITS	Problem management process	Formalize problem management process	IT Dir.	Mgr., Client Services	IT Mgr.'s and staff	-	-			х		
66	ITS	Change management processes	Review and revise existing change management processes (created through a 2019 LEAN project)	IT Dir.	Mgr., Client Services	IT Mgr.'s and staff	-	-			x		х
67	ITS	IT asset management	Standardize on the tool / tracking of all IT assets in ITSM solution	IT Dir.	Mgr., Client Services	IT Mgr.'s and staff	-	-		Х	х		
68	ITS	Knowledge management	Build and share a common knowledgebase for use internally within IT Branch, with a mandate that all documentation be stored in the knowledgebase. Plan to share some knowledgebase content with users.	IT Dir.	Mgr., Client Services	IT Mgr.'s	-	-			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
69	ITS	On and Off Boarding Process Review	Review and revise on and off-boarding processes in partnership with HR, Facilities, Finance. Shared process reviews should be communicated through ITGC.	IT Dir.	Mgr., Client Services	HR, Facilities, Finance,	-	-		x			
70	ITS	Formalize out of hours services	Consider, staggering shifts to extend service hours, engaging a 3 <sup>rd</sup> party service, developing a call-out roster, developing higher level SLA's with those business units that require out of ours support. Bring a proposal forward to ITGC that makes a recommendation on future direction. Communicate outcomes.	IT Dir.	IT Dir.	IT Mgr.'s	TBD	-		x			
71	ITS	Establish Cloud Posture / Strategy	The City cannot ignore this importance trend and should formalize a strategy and policy around the adoption of cloud technology that identifies and mitigates concerns, provides clear guidance on when and when not to, how and how not to leverage cloud technology.	IT Dir.	IT Dir.	IT Mgr.'s, Legal, Clerks, Finance	-	30,000		x			
72	ITS	Expanded IT Service Catalog – promoting easier self- service	Expand the currently basic Service Catalog, to provide details available about what services and products are available and what steps to take to order them.	IT Dir.	Mgr., Client Services	IT Mgr.'s	-	-		x	x	x	

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
73	ITS	IT Task automation	Implement 2-3 IT task automation projects per year. Aggressively promote password re-set adoption. Expand self-managed permissions / access controls. Continue to evolve use of Microsoft Software Centre (self-service software installation).	IT Dir.	Mgr., Client Services & Mgr., Infrastru cture	IT Staff	-	-		x	x	x	x
74	ITS	TeachingCity partnership	Continue to explore opportunities to leverage TeachingCity partnership - with particular focus around data and smart city, ensuring sustainability in the deliverables. Run at a minimum 1-2 initiatives per year, beginning in 2021	IT Dir.	IT Dir.	Teaching City Coordinat or, IT Mgr.'s	-	-		x	x	x	x
75	Bus	Business Solutions Lifecycle	A continuation of the ongoing program to manage the Business Solutions Lifecycle including regular reviews of necessary updates, patches and upgrades to keep within maintenance and support, and to support required capacity for Business Solutions.	IT Dir.	Mgr., Busines s Solution s	IT Mgr.'s, Business Solution Team, Business Units	-	-		x	x	х	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
76	Bus	Maximo	Launch the Maximo solution, including Work Management and mobility services for a range of City assets (functional needs could be addressed through other projects)	Comm. Communit y Services	Maximo PM	IT Mgr.'s, Business Solution Team, Business Units	Budgete d	Budgete d	x	x			
78	Bus	Maximo – Ongoing Evolution	As with any large enterprise grade platform, the City must plan for ongoing evolution and enhancement of the Maximo platform (subject to approved funding)	Comm. Communit y Services	Maximo PM	IT Mgr.'s, Business Solution Team, Business Units	TBD	TBD			x	х	x
79	Bus	Road Patrol	Implementation of a Road Patrol solution within Maximo, or at a minimum that integrates with Maximo	Comm. Communit y Services	IT Projects and Portfolio Mgr.	Business Solutions Mgr.	TBD	TBD		х			
80	Bus	Asset Management / Decision support solutions	Implementation of Pavement Management, Bridge Management and other asset management solutions required to support more specific AM needs of specific programs.	Dir. Engineeri ng	IT Projects and Portfolio Mgr.	Business Solutions Mgr.	20,000	100,000			x	х	
81	Bus	Asset Modelling solutions: Traffic	Implementation of Traffic / Transportation modelling solution	Dir. Engineeri ng	IT Projects and Portfolio Mgr.	Business Solutions Mgr.	TBD	TBD			x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
82	Bus	Cityview	Launch the Cityview solution, including Building Permits, Planning and Licensing, digital drawing management, mobility services and online services. This project also includes data migration work.	Comm. Corp Services	CityVie w Project Mgr.	Project Team	Budgete d	Budgete d	x	x			
84	Bus	Cityview – Ongoing Evolution	As with any large enterprise grade platform, the City must plan for ongoing evolution and enhancement of the Cityview platform (subject to approved funding).	Comm. Corp Services	CityVie w Project Mgr.	Project Team	TBD	TBD			x	x	x
85	Bus	Business Systems Continued Evolution Assessment	Conduct an assessment and plan for the evolution of all key Business Systems (Maximo, CityView, Lagan etc.). Leveraging ITGC (and the respective Steering Committees), prioritize and manage feature-based enhancements balancing investment with the resources available to execute.	IT Dir.	ITGC	Project Team	TBD (as part of capital projects )	TBD		x	×	x	x
86	Bus	Agreements, Contracts management solution	Implementation of Agreements and Contracts management solution (currently managed in OLI).	Legal, Clerks	IT Projects and Portfolio Mgr.	Mgr., Business Solutions	-	-		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
87	Bus	Tax System Replacement	Replacement of the City's Tax Management solution, with a modern Tax management solution, including improved customer experience features	Comm. Finance	IT Projects and Portfolio Mgr.	Project Team	Budgete d	Budgete d	x	x			
88	Bus	PeopleSoft Finance Roadmap and Business Case	Conduct a review of current state and develop a roadmap for Finance System Enhancements and a supporting Business Case for the roadmap / implementation activities - with a focus on improving user experience and digitizing high volume transactions.	Comm. Finance	IT Dir., Comm. Finance	Project Team	-	100,000		x			
89	Bus	Finance Roadmap implementati on	Ongoing implementation of recommendations resulting from the development of the Finance Roadmap	Comm. Finance	IT Projects and Portfolio Mgr.	Project Team	TBD	500,000				x	x
90	Bus	HCM Replacement	As per HCM review and roadmap, implement modernized HCM solution corporately to include improved employee records (position management, progression, anniversaries, etc.), self-service for managers and employees simplified (and accurate) reporting and analytics, real time org chart	Exec. HR Dir.	IT Projects and Portfolio Mgr.	Project Team	500,000	750,000			×		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
91	Bus	Scheduling, Time and Attendance	Implement significantly improved (more efficient) payroll, time and attendance (online vacation, lieu requests, etc.), and scheduling management solution	Exec. HR Dir.	IT Projects and Portfolio Mgr.	Project Team	Inc. in 93	Inc. in 93			x		
92	Bus	Learning Management System & certification tracking	Implementation of a corporate learning management solution providing certification tracking	Exec. HR Dir.	IT Projects and Portfolio Mgr.	Project Team	Inc. in 93	Inc. in 93			x		
93	Bus	Health and Safety tracking	Implementation of a health and safety management solution	Exec. HR Dir.	IT Projects and Portfolio Mgr.	Project Team	Inc. in 93	Inc. in 93			х		
94	Bus	MS Access Decommissio ning Program	A large portion of the most active MS Access solutions at the City should be replaced by CityView or Maximo solutions. Once completed both of those projects have been substantially delivered, there should be a review to determine which MS Access solutions can be decommissioned.	IT Dir.	Busines s Solution s Mgr.	Project Team	-	-		×	×	x	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
95	Bus	Corporate Project and Portfolio Management solution	A corporate Project and Portfolio management suite of solutions are required for numerous teams (construction projects, technology projects, etc.) - this should include project management and planning, task assignment, collaboration and sharing, portfolio management and reporting and financial reporting.	IT Dir.	IT Projects Mgr.	Project Team	50,000	-			x		
96	Bus	Enterprise Content Management solution implementati on	Following recommendations of the City's RIM assessment and strategy, and following work to ready the organization, implementation of a corporate wide ECM (electronic content - document and records - management system) will be required. This is a major under-taking that brings institution-wide change. The City must ensure is sufficiently understood, committed to by leadership and staff, and resourced to be successful.	City Clerk, IT Dir.	IT Projects and Portfolio Mgr.	ITGC	250,000	1,500,00 0				×	×

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
97	Bus	Meeting management software (including report writing and approvals)	Implementation of a report authoring, meeting and agenda management solution	City Clerk	IT Projects and Portfolio Mgr.	Project Team	TBD	Budgete d	x	x			
98	Bus	Officer Enhancement s	Implementation of enhancements to bylaw officer solutions and mobile technology - based on audit and other findings	Comm. Corporate Services	IT Projects and Portfolio Mgr.	Project Team	Budgete d	Budgete d	x				
99	Bus	Officer Enhancement s (ongoing evolution)	Implementation of the next phase of enhancements to bylaw officer solutions and mobile technology	Comm. Corporate Services	IT Projects and Portfolio Mgr.	Project Team	TBD	TBD		x	x		
10 0	Bus	Parking - Plate Recognition	Implementation of vehicle based mobile plate recognition solution for parking enforcement	Comm. Corporate Services	IT Projects and Portfolio Mgr.	Project Team	TBD	TBD				х	
10 1	Bus	Parking Access and Revenue Control System	RFP to be released in 2020 to procure real-time computerized parking access and payment system.	IT Dir.	Parking	Project Team	TBD	Budgete d	x				
10 2	Infra	NG-9-1-1	Infrastructure upgrades, implementation and integration to Crisys to prepare for Next-Generation 911 services	Fire Chief	IT Projects and Portfolio Mgr.	IT Dir., Mgr., Infrastruct ure & Security	Budgete d	Budgete d	x	x	x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
10 3	Infra	Public Wi-Fi service delivery review and potential expansion.	Conduct feasibility study to review Wi-Fi needs, business model and recommend suitable delivery strategies for Public Wi-Fi at civic and community facilities, downtown, parks and open spaces.	IT Dir.	Mgr., Infrastru cture & Security		-	30,000		×			
10 4	Infra	Digital Meeting solution - socialization, training and best practices	Although the City has rolled out Skype, it has not been as broadly used as hoped. Before deploying Teams, revisit the Skype rollout to conduct a lessons learned, address best practices and communications needs, provide additional training and determine whether to grow adoption or procure alternative technology.	IT Dir.	IT Projects and Portfolio Mgr.		-	-	x				

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
10 5	Infra	Office 365 Implementati on	Initial migration of Email to Office 365 - including improved mobile email experience followed by potential expansion to incorporate Teams and other collaboration technologies (including SharePoint and OneDrive). Important that the City focuses upon change management for staff and that this work is aligned with activities recommended in the RIM strategy. Functional mobility requirements should also be considered as part of this work. This also includes access for non-office-based staff.	IT Dir.	IT Projects and Portfolio Mgr.	Mgr., Infrastruct ure & Security	40,000	50,000		×	×		
10 6	Infra	Modernized and standardized meeting room technology	Set a standard for board and meeting rooms (teleconference tech, TV screen, camera) and invest in standardizing meeting room technology - program over 3 years	IT Dir.	Mgr., Infrastru cture & Security		-	100,000		x	x		
10 7	Infra	Large file transfer solution	Review overall effectiveness of the "Too Big for Email" solution with a modern large- file transfer solution that is available to all (and integrated into the City's chosen collaboration solution)	IT Dir.	IT Projects and Portfolio Mgr.		-	-		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
10 8	Infra	Mobile technology platform to support mobile projects (Cityview, Maximo)	Ready the mobile platform (devices, connectivity, security, business solutions, and accessories) to support major projects	IT Dir.	Mgr., Infrastru cture & Security		30,000 (Lease)	-	x	x			
10 9	Infra	Review Device Mix options and determine future device rollout strategy	Move to a greater proportion of the computer fleet being laptops and mobile technologies to support increased employee flexibility. Review current mix and develop plan for rolling out increased choice of devices and a rollout strategy that more effectively meets the demands of business units, managers and staff	IT Dir.	Client Services Mgr.		TBD	TBD		x	x		
11 0	Infra	Review device Lifecyle management process	Review the current process for identifying (laptop, tablet, desktop, mobile) lifecycle replacement requirements, for ordering new devices and for distributing new devices.	IT Dir.	Client Services Mgr.	Mgr., Infrastruct ure & Security	-	-	x				
11 1	Infra	Develop Technology Roadmaps (Network)	Develop a 5-year roadmap, expansion and investment plan for Network evolution	IT Dir.	Mgr., IT Infrastru cture & Security	IT Mgr.'s	-	-		x	x		

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
11 2	Infra	Develop Technology Roadmaps (Compute)	Develop a 5-year roadmap and investment plan for Compute evolution (in the context of Cloud strategy work)	IT Dir.	Mgr., IT Infrastru cture & Security	IT Mgr.'s	-	-				x	
11 3	Infra	Develop Technology Roadmaps (Storage)	Conduct a data assessment, develop capacity need projections, identify stored data that is "stale" that can be archived, develop an archiving strategy. Build a 5- year plan for storage management	IT Dir.	Mgr., IT Infrastru cture & Security	IT Mgr.'s	-	-			x		
11 4	Infra	Business Continuity and Disaster Recovery Plan	Develop corporate business continuity plans (through conducting Business Impact Assessments), develop a comprehensive Business Continuity Plan to identify Disaster Recovery needs and Develop a formal Disaster Recovery Plan	IT Dir.	Mgr., Infrastru cture & Security	IT Mgr.'s	10,000	70,000		x			
11 5	Infra	Disaster Recovery Technology Implementati on	Implementation of DRP recommendations to support required DR capabilities to meet business unit business continuity needs	IT Dir.	IT Projects and Portfolio Mgr.	Mgr., Infrastruct ure & Security	50,000	-			x	x	

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
11 6	Infra	Secure a managed security service partner and continue to evolve an effective Security Program	Secure services of a Security Managed Services provider to operate your security program, freeing up internal staff from day-to-day duties	IT Dir.	Mgr., Infrastru cture & Security		100,000	-		x	x	x	x
11 7	Int & D	Integration Lifecycle	Integration updates and patches, upgrades and replacements to keep within maintenance and support	IT Dir.	Busines s Solution s Mgr.		-	-	х	х	x	х	х
11 8	Int & D	Corporate GIS and Data Strategy	Develop a corporate GIS and Data Strategy that assesses the maturity of the City's GIS and Data programs and recommends a roadmap for leveraging GIS and Data more consistently and effectively across the organization.	IT Dir.	IT Dir.	Business Solutions Mgr., GIS Staff, Engineeri ng, Planning	-	75,000			x		
11 9	Int & D	Property Information Tool	GIS based tool that aggregates data known about properties within the City (e.g. development, permit, bylaw, tax, parking history, nearest services, etc.)	IT Dir.	GIS & Data Program Mgr.		-	-			x		
12 0	Int & D	AVL and Telematics replacement	Implementation of AVL and telematics solution for GPS.				Budgete d	Budgete d	х	х			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
12 1	Int & D	TeachingCity - Data Program Partnership	Explore a partnership with TeachingCity to explore, demonstrate and help build the business case for a data program at the City.	IT Dir.	Busines s Solution s Mgr.		-	-			x		
12 2	Int & D	Datawarehou se	Establish a corporate Datawarehouse platform	IT Dir.	GIS & Data Program Mgr.		40,000	200,000			x		
12 3	Int & D	Dashboards and Analytics	Establish BI and Dashboard standards (PowerBI and ESRI GIS)	IT Dir.	GIS & Data Program Mgr.		-	-			x	х	
12 4	Cust	Customer Facing Lifecycle	Customer facing solutions updates and patches, upgrades and replacements to keep within maintenance and support	Communi cations and IT Dir.	Busines s Solution s Mgr.		TBD	TBD	x	x	x	х	x
12 5	Cust	CRM Upgrade	Upgrade of Lagan CRM system	Comm. Corporate Services	IT Projects and Portfolio Mgr.	Business Solutions Mgr.	Budgete d	Budgete d	x				
12 7	Cust	Building Permits online	To be implemented as part of the Cityview project	Comm. Dev Services	CityVie w Project Mgr.	Project Team	Budgete d	Budgete d		x			
12 8	Cust	Digital Drawing markup	To be implemented as part of the Cityview project	Comm. Dev Services	CityVie w Project Mgr.	Project Team	Budgete d	Budgete d		x			
12 9	Cust	Business Licences online	To be implemented as part of the Cityview project	Comm. Corporate Services	CityVie w Project Mgr.	Project Team	Budgete d	Budgete d		x			

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
13 0	Cust	Digital Services expansion roadmap	Working with the Web and Digital Steering Committee to identify and prioritize web and digital service roadmap	Comm. Corporate Services	Mgr. Corpora te Comms	Steering Committe e	-	50,000			х		
13 1	Cust	Digital Services expansion	Implementation of roadmap recommendations. Consideration should be given to community engagement. Initial results highlighted importance around; Proclamation Requests Computer Kiosks at City Facilities (public access to City website/services), FOI requests, Road-related, filming and event permits, Tax certificate (ability to download), City facility rental, Delegation requests to Committee/Council, Business licensing, Minor planning applications and building permits, More data via the Open Data portal)	Comm. Corporate Services	Corp Comm, Clerks	Project Teams	TBD	TBD			×	×	x
13 2	Cust	eForms program	More rigorous planning regarding the conversion of online forms into customer centric services enabled by digital forms. Web and Digital Steering Committee to manage and report to ITGC.	Comm. Corporate Services	Clerks & Comms	ITGC	-	-	x	x	x	x	x

ID	Cat	Initiative	Description	DRI	Lead	Assist.	Op.	Cap.	2020	2021	2022	2023	2024
13 3	Cust	Open Data Expansion	Assign leadership. Continue to grow and expand the Open Data program at the City (geo-spatial and non- geo-spatial data) for both citizens and staff.	Comm. Corporate Services	GIS & Data Program Mgr.		-	-			x	x	x

## **Appendix 3: Sample ITGC Terms of Reference**

#### Mandate

The **Information and Technology Governance Committee** (ITGC) is responsible for setting strategic directions for technology and technology services based on corporate and Council priorities. The Governance Team will determine technology funding and project prioritization and make decisions regarding large scale investments and strategic approaches. The Team will be responsible for monitoring the delivery of the technology portfolio and IT service delivery ensuring that service delivery is meeting the needs set out in the City's Corporate Strategic Plan and Branch Business Plans.

#### **Duties and Responsibilities:**

- Owns the Corporate Technology Strategy
- Accountable for developing / recommending annual IT Capital priorities and budget
- Oversight and monitoring of the IT Project Portfolio
- Agrees to and endorses the criteria for evaluation of technology projects
- Approves IT annual workplan and approves significant changes to the workplan throughout the year
- IT policy review, approval and recommendation
- Technical standards review and ratification from Technical Standards Team
- Approval of multi-year strategic work programs from Steering Committees (individual projects within the plans will be routed through the IT Projects Office)
- Strategic IT Key Performance Indicators (KPIs) monitoring (financial, resource and infrastructure utilization, standards)

#### **Meetings:**

Monthly meetings (suggested 1.5 hours)

#### Membership:

Membership and changes to the membership of the ITGC must be approved by CLT.

CLT + IT Director

At this stage in the City's journey, the most important function of the governance model is to keep the City focused on priorities – this will be simpler and more effective with a smaller group. At a later stage (perhaps after 24-36 months) the City may review the formulation of the group, once the frameworks to guide technology have been well established and decide to adopt new behaviours.

# Appendix 4: 2011 Strategy Completion Checklist

## **Business Technology Projects**

Focus Area	Status	Work (2011-2019)
Lagan CRM	Yes	Lagan – support of Phase 2, 3 and 4
		Lagan – Online Service Request
		Lagan – Back office system integration (OLI, forestry)
Work Mgmt	In Progress	Work Management Strategy and requirements definition
		Work Management Implementation (including GIS integration)
		Fleet system replacement (potential to evaluate reuse of WMS)
		Work Management Implementation (including GIS integration)
RIM	In Progress	Document and Records Management Assessment
		Document Management Implementation
		Document Management Implementation
		Information Management Strategy / Plan
Mobility	In Progress	Mobile Strategy and Workplan
		Mobile Solution Implementation
		Mobile Work Management Implementation
Dispatch	No	Fire / CAD Dispatch replacement (partnership w/ Whitby) (including AVL and Remote Access)
OLI	In Progress	Licensing System Implementation
		OLI enhancements and extension to additional business processes
FMW	Yes	Finance – review of budgeting, processes and tools
		Implement budget solution
PeopleSoft	In Progress	HRMS – Training Tracking and Licenses and Certification
		Finance – Procure to Pay
		HRMS – Time and Attendance (Lieu Time Tracking)
		HRMS – Succession Planning
		HR – Scheduling Solutions
Wi-Fi	In Progress	Public Wi-Fi33 (downtown, parks, city facilities)
Corp. Performance	No	Corporate Performance Metrics / Performance Reporting System
Online Svcs	In Progress	Expansion of Online Services

## **Technology Infrastructure Projects**

Focus Area	Status	Work (2011-2019)
MS Office	Yes	Office 2010 and Windows 7 deployment
		Office 2016 deployment
		Windows 10 deployment
UC	In Progress	Unified Communications Strategy & Planning
		UC implementation
Print	Yes	Print Consolidation Strategy
		Print Consolidation implementation
Integration	No	Integration Technology Strategy
		Integration toolset implementation
DR	No	Disaster Recovery Planning
		DR implementation

### Technology Upgrade Projects (Lifecycle)

Focus Area	Status	Work (2011-2019)
Lagan CRM	In Progress*	Lagan (2 Years)
Nakisa	In Progress*	Nakisa (2 Years)
Networking	In Progress*	Network Switch Upgrade (4 Years)
PeopleSoft	In Progress*	PeopleSoft HR (4 Years)
		PeopleSoft Financials (4 Years)
ESRI GIS	In Progress*	GIS (3 Years)
OLI	In Progress*	OLI (3 Years)
Telephony	In Progress*	Telephone System (3 Years)
CLASS	In Progress*	CLASS (3 Years)
Crisys	In Progress*	Crisys (3 years)

\* Technology upgrades have occurred at least once with respect to business systems but should adhere closer to the cyclical lifecycle recommendations

## IT Service Delivery

Focus Area	Status	Work (2011-2019)					
Partnership and Engagement	In Progress	IT Management team engage at management and director level more frequently, meeting with peers to discuss plans, strategies and current initiatives					
IT Governance Structure	Yes	ISSC established					
		Revised IT investment prioritization methodology					
		Run budget through ISSC					
Process Standardization	In Progress	Policy and Standards Framework					
		Change management					
		Security Framework and Policy					
		Infrastructure Lifecycle Plan development and lifecycle planning					
		Application Lifecycle Plan development and lifecycle planning					
		Service management					
Service Requests	In Progress	Service management solution					
		IT asset management					
Project Management	In Progress	Project selection					
		Project approval process					
		Project selection criterion					
		PM standard methodology					
		PM solution					
		Business case methodology agreement, adoption and operation					
Metrics	In Progress	Metrics established (financial, PM, service performance)					
After Hours Services	No	Review and implement response to after-hours service (corp needs to be approved by ISSC)					
Training	In Progress	Develop, approve and deliver an annual broad training plan					
		Bundling system training with project work (implementations and upgrades)					

## IT Organization (Human Resources)

Focus Area	Status	Work (2011-2019)
IT Planning, Standards and Policy Project Mgr	Yes	Assigned role (reallocation of existing resources)
Technical Administrator	Yes	Assigned role
Recruit for vacant BA positions	Yes	Roles filled
Project Human Resources (Backfill) for Projects	No	Backfills are nearly always unfunded
Library IT Resources Review	In Progress	Enhance relationship, knowledge mobilization and explore shared services
Security 'lead' in IT	Yes	Assigned IT security role

#### Legend

In Progress – Working on it

Yes – Completed

No – Not Completed
# Appendix 5: IT Staffing and Expenditure Comparison

### **Staffing Comparisons**

Municipality	Population (2017)	Туре	IT Headcount (FTE)	IT staff per 100k
Oshawa	170,071	Lower Tier	23	13.5
Whitby	135,566	Lower Tier	21	15.5
Richmond Hill	208,370	Lower Tier	34	16.3
Burlington	205,960	Lower Tier	36	17.5
Waterloo	113,520	Lower Tier	20	17.6
Greater Sudbury	164,926	Single Tier	34	20.6
Cambridge	129,920	Lower Tier	31	23.9
Kitchener	242,368	Lower Tier	61.6	25.4
Oakville	211,382	Lower Tier	57.1	27.0
Newmarket	84,224	Lower Tier	23	27.3
Barrie	153,356	Single Tier	42	27.4
Guelph	135,474	Single Tier	39	28.8

The following budget comparisons are provided as an indicator against municipalities that are leading and investing in technology.

## **Capital and Operating Comparisons**

2019	Burlington	<b>Richmond Hill</b>	Oshawa
Capital Budget	\$9,546,000	\$3,090,000	\$1,115,000
Operating Budget	\$6,963,097	\$8,009,900	\$5,513,667
2018	Burlington	<b>Richmond Hill</b>	Oshawa
Capital Budget	\$1,765,000	\$9,230,400	\$1,845,000
Operating Budget	\$5,246,892	\$7,618,900	\$5,220,306
2017	Burlington	<b>Richmond Hill</b>	Oshawa
Capital Budget	\$2,430,000	\$12,246,800	\$1,940,000
Operating Budget	\$6,018,367	\$7,114,800	\$5,081,024

## **Operating Breakdown – 2019**

2019 – Operating Breakdown	Burlington	Cambridge	Richmond Hill	Oshawa
Net Operating Budget	\$6,963,097	\$5,930,000	\$8,009,900	\$5,513,667
Total Staffing	\$4,221,829	\$3,675,300	\$4,648,100	\$2,498,380
Net Operating Less Staffing	\$2,741,268	\$2,254,700	\$3,361,800	\$3,015,287



**Baseline IT Assessment** 

Preparing for strategy-based growth.



Initial Findings Report – August 18, 2014





## Objective

- Executive Summary
- Findings
- Recommendations
- Supporting Data





**Diverse Systems Group** 

2



Undertake a baseline assessment of the City's core IT Systems and Management practices with a focus on:

**Governance:** reporting, strategic alignment and transparency;

**Portfolio Lifecycle:** number of systems, aging and issues severity;

**General:** staffing observations, contractors, technology utilization and value.





3



# **Executive Summary**







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## **Executive Summary**

- The "existing" systems and operational inventory appears to be stable, accurate and secure.
- Several core business systems require upgrading or entirely new solutions (Class, OLI, mobile communications, remote access);
- ITS strength appears to be maintaining infrastructure and installed systems versus delivering innovation and new business solutions.
- The demand for new IT based services and tools is not being met and the Governance ISSC function is broken.
- ITS department policies are impeding adoption of new services and technology modernization.
- City departments are reluctant to share data, reengineer processes and take full advantage of modern information resource opportunities.





5

## Four Basic "R" Questions





- Information demand has become pervasive;
- Change will be constant;
- Technology delivery is expensive;
- Self service is expected and must be effective;
- Effective technology deployment is transformational;
- Prioritization of opportunities is critical for business goals;
- Available financial resources will continue to be scarce.







# Findings





# Findings – General

- The ISSC doesn't function and has no transparency to the users;
- User requests (demand) far exceed the services (delivery) of ITS;
- Some key systems are quickly approaching end of life status;
- New projects lack direction and commitment;
- Industry "best practices" and "standards" are not being used;
- New business solutions are not being adopted effectively;
- Technology and business collaboration is weak;
- Almost no cross system data integration.







- The installed technology infrastructure is robust and stable
- The 2010 Strategic Plan was ineffective at creating change
- Many industry best practices have not been adopted
- Business solutions are being developed internally vs. purchased
- Policies do not support business needs
- Status and communications to all levels is weak
- New projects and upgrades are taking too long to deliver





## **Information Technology Services - SWOT**

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## **Strengths**

- Solid network infrastructure
- Three year desktop refresh cycle
- Utilizing major software vendors
- Stable / responsive staff
- Active backup strategy
- Broad applications inventory

## **Opportunities**

Oshawa

- Define a clear governance process
- Refocus resources on value roles
- Offload utility functions
- Manage a portfolio of services
- Collaborate and innovate with bus. units

Positive

- Explore Smart Cities concept
- Engage and share with other cities

## Weaknesses

- Governance process not working
- Not effectively using standards
- Still developing software in-house
- Policies are limited or out of date
- Lack of transparency with users
- No use of metrics or status reporting

## Threats

- Model increases reputational risk
- Business units develop own solutions
- Maintenance supersedes renewal
- Innovation fails to support strategy
- IT becomes a utility vs. an enabler
- Budget fails to keep up with needs

**Negative** 

Function becomes irrelevant

External Factors

Internal

**Factors** 

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## Recommendations







12

## **Recommendations Roadmap**

## **Action and Transformation**

## Near Term (next 6 months):

Address fundamental weaknesses and create building blocks for clear management of the ITS function.

## Medium Term Planning (6 months ~ 2 years):

Initiatives that will refocus IT outcomes around effective business solutions delivery, cost effectiveness and collaboration.

## Future State:

ITS is an enabler for an organization that delivers efficient value based services. Transitioning the IT function from technology manager to a business enabler and innovation leader





## Near Term (next 6 months)

- Undertake a stakeholder needs analysis;
- Move forward on backlog of positive return projects;
- Rework strategic plan to highlight business priorities;
- Develop policies that enable change;
  - Desktop, mobility, privacy, security, business usage
- Implement a clear and transparent governance model;
  - Clear accountability and processes
  - Effective transparency and reporting
  - Prioritize the demand and delivery inventory
- Revisit the 2010 ITS Strategic Plan to learn;
  - What worked/didn't work and why
  - Identify recommendations for delivering effective IT
  - Use updated outcome for internal ITS and Client familiarization
- Identify, select, start key industry operations and project practices;
  - Operations practices such as ITIL
  - Project / Program Management such as PMI/PMO







## Medium Term Planning (6 months ~ 2 years)

- Develop a systems roadmap including user metrics;
- Adopt a standard desktop software template;
- Implement a formal PMO role and processes;
- Create and maintain a systems portfolio roadmap;
- Contract or outsource necessary utility functions;
- Develop a skills inventory and gap analysis for roles;
- Identify opportunities for collaboration with other cities;
- Clearly align IT services and deliverables to city strategy and priorities through the governance process;
- Publish regular metrics and status reports for improved communications, collaboration and outcomes;
- Develop an onboarding process for new staff.







# Future State Strategy Based Considerations

- Refocus IT services for collaboration, business solutions, innovation and information by outsourcing utility functions such as: help desk, server management and networks;
- Create a Program Management Office role responsible for project control, metrics, reporting and budgeting;
- Examine mobility, cloud computing and outsourcing in all future business case studies;
- Place social media and web services content and design outside the ITS function;
- Develop a broadband and mobile strategy for all future city departments based on a self service model;





## New IT Business Model (Future State)



A new Information Technology paradigm focusing on solutions and partnering with the business drivers of the city.

## **IT Value Transformation (Future State)**





**Diverse Systems Group** 

Dshawa



# **Supporting Data**





## **Functions Interviewed**

- Information Technology Services
- Service Oshawa
- Development Services
- Finance Services
- Corporate Communications
- Community Services
- City Council (Roger Bouma)





**Diverse Systems Group** 

## **Governance Leadership - Best Practice**



## **Good Governance Benefits**

## Maturity, Predictability and Value;

- Scarce IT assets are assigned to the best corporate and business outcomes;
- Business demand requirements are visible and prioritized;
- The best long term delivery solution will be selected;
- Project staffing is aligned with company priorities;
- Training, transformation, business and customer planning is identified;
- Capital, operating budgets and costs/benefits are clearly measured;
- The process provides a new foundation for employee and business measurement.







- 1. Administration: policies, best practices, business process for technology solutions;
- 2. Tools: strategy, budgets, business case, program management;
- 3. Standards: software, hardware, services & maintenance;
- 4. Security: risk and compliance rules;
- 5. **Resourcing:** insource, outsource, contract & shared;
- 6. Collaboration: procurement, RFP's, vendor management and government associations.







## Thank you for your time!







То:	Corporate Services Committee
From:	Beverly Hendry, Commissioner, Corporate Services Department
Report Number:	CORP-17-34
Date of Report:	June 15, 2017
Date of Meeting:	June 19, 2017
Subject:	Internal Audit - Information Technology Function Review
File:	C-3100

#### 1.0 Purpose

The purpose of this report is to transmit the KPMG Information Technology Function Audit.

#### 2.0 Recommendation

That the Corporate Services Committee recommend to City Council:

That Report CORP-17-34 dated June 15, 2017 and Attachment No. 1 being the KPMG Information Function audit report be received for information and that the recommendations and management responses in the audit be endorsed as the basis for improving the information technology function.

#### 3.0 Executive Summary

Not applicable.

#### 4.0 Input From Other Sources

The Information Technology Function audit by KPMG was conducted with the involvement of the appropriate City employees.

#### 5.0 Analysis

On November 28, 2016, Council endorsed the 2017 Audit Plan. Six audits were part of the Plan, as follows:

- Overtime Follow-up Audit
- IT Function Review
- Work Order Management

## Report to Corporate Services Committee Meeting Date: June 19, 2017

- Cyber Risk and Maturity Assessment
- Recruitment and Retention of Staff
- Administrative Monetary Penalties (AMPs)

The first of the six audits are now complete with the submission of the KPMG Information Technology audit findings and recommendations.

The audit report includes eight recommendations (three high risk, four medium risk and one low risk) related to the following areas:

- 1. Development of a new Information Technology Strategic Plan (ITSP) (high risk)
- 2. Standardization of portfolio and project management (high risk)
- 3. Clarity around information and information systems ownership (high risk)
- 4. Updating of IT staff roles and responsibilities (medium risk)
- 5. Better utilization of automation and system tools (medium risk)
- 6. Clarity around the role of the Information Systems Steering Committee (ISSC) and project executive sponsors (medium risk)
- 7. Development of key performance indicators (medium risk)
- 8. Development of knowledge base and documentation repository (low risk)

#### 6.0 Financial Implications

There are no immediate financial implications as a result of this audit; however, a funding request will be brought forward to Council for the new ITSP in the fall of 2017 and a request for a summer student to aid the IT Help Desk will be included in the 2018 budget.

### 7.0 Relationship to the Oshawa Strategic Plan

This report responds to the Council-approved principle of financial stewardship, which underlies the Oshawa Strategic Plan. It also responds to the goals of Economic Prosperity – Ensure economic growth and a sound financial future, and Accountable Leadership – Ensure respect, responsiveness and transparency.

Ven Break

Helen Break, Director, Strategic Initiatives, City Manager's Office

Dave Mawby, Director Information Technology Services

Beverly Hendry, Commissioner, Corporate Services Department

Attachment

Item: CORP-17-34 Attachment 1



# City of Oshawa

#### **Internal Audit of the IT Function**

#### **Overall report rating:**

Yellow-red: Partial assurance with improvement opportunities

KPMG LLP May 4, 2017 This report contains 28 pages Appendices comprise 10 pages

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Document Classification: KPMG Confidential



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Ap	pendices	
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- A. Summary of IT organization structure
- B. ISSC structure and role
- C. Roles of a (Project) Executive Sponsor
- D. Staff involvement and documents reviewed

Distribution

To (for action):

• Dave Mawby, Director, Information Technology Services

Cc (for information):

- Steve Patterson, Manager, Systems and Security Operations
- Linda Mielwczyk, Manager, Applications Support

Sponsor:

• Beverly Hendry, Commissioner, Corporate Services

This report, together with its attachments, is provided pursuant to the terms of our engagement. The use of the report is solely for internal purposes by the management of the City of Oshawa, pursuant to the terms of the engagement, it should not be copied or disclosed to any third party or otherwise quoted or referred to, in whole in part, without our written consent.



## Section One

## **Executive Summary**

#### Conclusion

We have provided a grading of partial assurance with improvement opportunities (yellowred) for the review of the IT function at the City of Oshawa. Our review identified Information Technology Services (ITS) as a function is able to provide support for day-today operations and able to respond to requests or incidents that are raised, but will benefit from more proactive actions to better meet the needs of the business users. ITS recognizes this need and is currently implementing an approved, significant organizational change initiative alongside other improvement initiatives in order to ensure that the services provided match the needs of the Corporation.

We evaluated whether the current ITS governance structure and the Information Systems Steering Committee (ISSC) ensured stakeholder needs are being identified in the prioritization and execution of IT-related projects for the City. While ITS and ISSC structures have been defined, duties and responsibilities require further clarification as they are not fully understood or executed as described.

We noted that project scoring criteria, approved by the Corporate Leadership Team, has been established and IT-related projects have been prioritized by the ISSC on that basis. Projects have also been assigned Executive Sponsors from the Departments. As these projects are initiated, the duties and responsibilities of the Executive Sponsor on each project can be more clearly defined to emphasize their role in endorsing the project.

We assessed the scope of work of ITS and how the teams are organized and governed to support delivery and alignment with the City's Strategic Plan. We also assessed how ITS roles and responsibilities have been defined and assigned to support delivery, of IT services at the City. As a small team with a broad portfolio, staff are required to multitask and prioritize day-to-day operational tasks, project initiation and delivery, and support end users with incidents and requests. Future state consideration should be given to the separation of project management duties from operational support to allow for better focus and alignment of skillsets. ITS could also benefit from more robust knowledge management practices, changes to the Help Desk staffing model and leveraging of existing tools to automate or streamline work in areas such as incident management, security event management and change management.

Through interviews with stakeholder groups across the City, we assessed whether stakeholders felt their IT needs were being identified and met, and whether IT-related projects were prioritized, managed and executed in line with stakeholder expectations.



Stakeholders reported receiving good service on operational requests but expected more proactive support, communication and advice from ITS. The nature of support, communication and advice will vary by stakeholder groups and as such, should be further elaborated through undertaking a City-wide IT strategic planning exercise to develop the ITS strategic plan.

We have not benchmarked the City's ITS budget or resources against other municipalities given the different ways that ITS in such organizations can operate, however leading practices have been incorporated into our recommendations.

#### Background

This internal audit forms part of the Internal Audit Plan for 2017 for the City of Oshawa ("City" or "Corporation").

This review focuses on the organizational structure and governance in place across ITS to ensure it is positioned to respond efficiently and effectively to these demands, as well as risks arising from other internal and external factors.

The review includes an assessment of the key processes in place within IT and the team, and also considers the role of the Information Services Steering Committee (ISSC) and how the Committee supports the prioritization of IT-related projects.

	1 <b>.</b>	
Ub	lectives	5
		-

Objective	Description of work undertaken
Objective one	We assessed the City's IT organizational design and control practices
II Function Review	appropriate), covering the following activities:
	• Evaluated the IT governance structure of the ITS Branch and ISSC to assess whether accountabilities and reporting relationships for IT have been adequately defined, documented and communicated;
	<ul> <li>Assessed the scope of work of the IT function and how the divisions are organized and governed to support delivery and alignment with the City's Strategic Plan;</li> </ul>
	<ul> <li>Assessed how stakeholder needs are being identified by IT and how IT-related projects are prioritized, managed and executed;</li> </ul>
	<ul> <li>Assessed how ITS roles and responsibilities have been defined and assigned to support delivery of IT services at the City;</li> </ul>



Objective	Description of work undertaken
	<ul> <li>Assessed stakeholder views as to how their IT needs are being met.</li> </ul>

#### Areas of good practice

- ✓ Day-to-day operations support is provided by ITS to meet user requests. Stakeholders receive good service once the support ticket has been raised.
- ✓ Infrastructure and hardware are refreshed on a regular cycle in line with industry good practice.
- ✓ A position for the Manager, IT Project Planning and Portfolio, has been created and advertised to establish more effective and efficient project and portfolio management practices.
- ✓ Duties of the Business Analysts are being re-aligned to move towards the standard expectation of the role, including a focus on Departmental and functional specialization to ensure more in-depth understanding of stakeholder needs.

#### Areas for development

- As has already been identified, the City does not have a current Technology Strategic Plan.
- Information and information system ownership have not been clearly defined, documented and understood.
- Project management practices are not standardized and defined.
- IT job descriptions are not current and responsibilities have not been updated for the recent re-alignment.
- There is limited automation of day-to-day tasks (logging, patch management, ticketing) which results in inefficiencies and potential duplication of efforts.
- The Information Systems Steering Committee (ISSC) has not been able to fully discharge its duties and responsibilities as described in the IT Governance Framework, for example with regards to the ownership of a Corporate Technology Strategy and review of strategic IT KPIs, policies and technical standards. The role of the ISSC is not consistently understood by stakeholders across the City.
- Key performance indicators such as Help Desk performance (average time to resolution, % of calls breaching Service Level Agreements), network performance and availability targets have not been developed for ITS staff to monitor and report against.



• There is a lack of a centralized ITS documentation repository or knowledge base that is shared between the Applications Support Team and the Systems & Security Operations Team in ITS.

#### Recommendations raised

We have raised the following recommendations (high priority represents the most urgent and high risk category):

	High	Medium	Low	Total
Raised	3	4	1	8
Accepted	3	4	1	8

#### Acknowledgement

We thank the staff involved for their help in completing this review.

#### **Contact Information**

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## Section Two

## Recommendations

This section summarizes the recommendations that we have identified from our work. We have given each of our observations a risk rating as follows:

Priority rating for recommendations raised				
Priority rating for recomme High – (Priority One): Issues arising referring to important matters that are fundamental and material to the system of internal control. The matters observed might cause a system objective not to be met or leave a	Additions raised Medium – (Priority Two): Issues arising referring mainly to issues that have an important effect on the controls but do not require immediate action. A system objective may still be met in full or in part or a risk adequately mitigated, the	Low – (Priority Three): Issues arising that would, if corrected, improve internal control in general but are not vital to the overall system of internal control. These recommendations are of leading practice as opposed to weaknesses		
risk unmitigated and need to be addressed as a matter of urgency.	weakness represents a deficiency in the system.	that prevent systems objectives being met.		

#	Risk	Recommendation	Management response, executive and deadline
1	High	IT strategy The most recent IT strategic plan was completed in 2011. ITS (as well as the City) has undergone a number of changes since this time and there is a risk that the plan set out in 2011 no longer meets the needs of the City. <u>Recommendation</u> : The City should undertake a detailed IT strategic planning exercise to understand the requirements of the City's Departments and evaluate how they can be met through investment in technology. In conjunction with senior	Management agrees with the recommendation. A request for funding to support the development of an updated Information Technology Strategic Plan (ITSP) will be brought to Council in the fall of 2017. Owner: Bev Hendry, Commissioner, Corporate Services and CLT Due date: 2018 Q4


#	Risk	Recommendation	Management response, executive and deadline
		management, a 3-year IT strategic roadmap for addressing these technology requirements should be prepared for approval by Council. Progress against this roadmap should be tracked by ITS and monitored by senior management.	
2	High	<ul> <li>Portfolio and project management</li> <li>A. A standardized portfolio and project management methodology has not been implemented within ITS. As such, the approach applied is dependent on the member assigned to the project and the timings, dependencies and interactions between different projects (which are being tracked in an Excel spreadsheet) are unclear. The development and implementation of formal standards will be the responsibility of the Manager, IT Project Planning and Portfolio, a position that has been created following the restructure and is being advertised.</li> <li>Recommendation:</li> <li>The first priority of the Manager, IT Project Planning and Portfolio, upon joining the City should be the development of a portfolio and project management approach for ITS or IT-enabled projects. This should include setting expectations over status reporting at the project and portfolio-level, resource management, stakeholder communications. "business as usual"</li> </ul>	<ul> <li>A. Management agrees with the recommendation. The City has recognized the need to formalize and bolster project and portfolio management practices. To this end, the hiring of a Manager, IT Project Planning and Portfolio is already underway and the position will focus on the identified goals as a priority over the first six months. The development of the appropriate roles and responsibilities of the business stakeholders will also be included as a key element in the development of a new ITSP.</li> <li>Owner: Dave Mawby, Director ITS</li> <li>Due date: 2018 Q1</li> </ul>



#	Risk	Recommendation	Management response, executive and deadline
		support procedures as well as supporting the business with understanding the roles and responsibilities of the business stakeholders throughout the project lifecycle.	
		B. Business Analysts in the Application Support division work on projects, perform daily operational tasks as well as respond to incident tickets for their applications.	<ul> <li>B. Management agrees with the recommendation.</li> <li>With the addition of the Manager, IT Project Planning and Portfolio, the</li> </ul>
		Recommendation:	Manager of Applications Support and current
		Consideration should be given towards separation of project management tasks from the Business Analysts / Applications Support team. This should allow staff to focus specifically on projects or application support and maintenance work, as well as ensuring that skill sets can be better aligned to the work undertaken.	Business Analysts are currently collaborating to refine the position's roles and responsibilities. With the number of active IT projects it is expected that some project management duties may need to stay with the Business Analysts in the short term.
			Owner: Dave Mawby, Director ITS
			Due date: 2018 Q1
		C. Business Analysts have discretion to work on change requests that are forecasted to take less than two days without going through the formal project approval process, but time spent on such changes are not tracked.	



#	Risk	Recommendation	Management response, executive and deadline
		Recommendation: A Lean review of Change Request processes, approvals and tracking should be carried out. The nature of change requests versus incident-related changes should be clearly defined by ITS management and communicated to both ITS staff and the business. All change requests should still be logged on the service management system, reviewed and approved by management. Time spent should be tracked through the service management system.	<ul> <li>C. Management agrees with the recommendation. Staff will review and update the change request vs incident management processes through a Lean review and communicate them to our stakeholders. The ITS Branch is in the process of implementing a new service management system and will ensure that all change requests will be entered and tracked in the system.</li> <li>Owner: Dave Mawby, Director ITS</li> <li>Due date: 2018 Q2</li> </ul>
3	High	<ul> <li>Information and information systems ownership</li> <li>A. The concept of information and information systems ownership is not clearly defined, documented or understood. The City collects, processes and stores a large volume of data/information assets on technology systems; however there is a lack of clarity as to who owns the various information assets and which Branch is accountable and responsible for driving the Information Management strategy, policies and standards. There is also no end-to-end</li> </ul>	



#	Risk	Recommendation	Management response, executive and deadline
		visibility of information assets that are stored on multiple systems and how they are used and managed. <u>Recommendation</u> : Senior management should agree on accountabilities and responsibilities for Information Management. Those charged should then drive the creation of the City- wide strategy, policies and standards, supported by the Departments and Branches at appropriate times.	<ul> <li>A. Management agrees with the recommendation. ITS has been working to improve information governance and ownership. Progress has been made with the identification of key Corporate Leadership Team (CLT) sponsors. As part of a planned update to the ITSP, senior management will be engaged in order to define the appropriate accountabilities and responsibilities for Information Management at the City. This information will be a key factor in developing the appropriate service and resource levels required to implement the ITSP.</li> <li>Owner: Dave Mawby, Director ITS Due date: 2018 Q4</li> </ul>
		B. Some information systems (applications) have been assigned to named business owners but the roles and responsibilities of these owners have not been defined. This does not ensure that sufficient accountability is assumed by specific individuals to	



# Risk	Recommendation	Management response, executive and deadline
	make decisions pertaining to system and IT support requirements. <u>Recommendation</u> : All applications managed by ITS should be assigned to named business owners. The roles and responsibilities of business owners and ITS should be defined, documented and communicated to all relevant individuals. ITS, business owners and those charged with Information Management responsibilities should ensure accurate classification of the information stored on the applications and assess for criticality, security and retention requirements.	B. Management agrees with the recommendation. ITS will expand the list of application business owners to include all business applications and will confirm, document, and communicate the current responsibilities. Additional responsibilities as a result of the ITSP per recommendation A above will be implemented following the development of the plan.
		Director ITS Due date: 2017 Q4
	<ul> <li>C. There was an inconsistent understanding of the responsibilities of ITS compared with the business. For example, a user misunderstood that ITS had declined the purchase of a mobile communication device, however the Mobile Communication Device Policy states that approval is to be provided by their Department Head. In addition, a previous audit identified that the business was not aware of existing system functionality although they had signed off on the implementation.</li> </ul>	<ul> <li>C. Management agrees with the recommendation. In 2016, the ITS Branch implemented an intranet website 'My IT' to provide information and assistance on technology services and policies. This site will be reviewed and updated to clarify procurement processes and responsibilities.</li> <li>Owner: Dave Mawby, Director ITS</li> <li>Due date: 2018 Q1</li> </ul>



#	Risk	Recommendation	Management response, executive and deadline
		Technology-related policies should be clearly signposted to all staff on the Intranet. For all applications and ITS services, procedure documents should be documented to clearly set out ITS vs business responsibilities.	
4	Medium	<ul> <li>ITS staff roles and responsibilities</li> <li>A. Job descriptions for ITS staff are not current, with some descriptions dating back to 2001. With the recent reorganization, some staff do not have clear understanding of their current responsibilities and duties. We note that ITS has starting work with HR on updating the job descriptions.</li> <li>Recommendation:</li> <li>ITS management should complete the review of existing job descriptions and update them to reflect current duties and responsibilities. ITS staff whose roles have changed should be involved and informed to ensure common understanding.</li> </ul>	<ul> <li>A. Management agrees with the recommendation. The current staff compliment in the ITS Branch fall into 17 distinct job descriptions. In 2016, the Branch updated and/or created 6 of the 17. ITS will continue to review and update where necessary the existing job descriptions in priority order, starting with the Business Analyst job description currently underway, while recognizing that this work will impact resources in both ITS and HR and that additional changes may be required as a result of a new ITSP.</li> <li>Owner: Dave Mawby, Director ITS</li> </ul>
		B. The Network Security Manager is responsible for designing and implementing security procedures and systems to protect the City's	



#	Risk	Recommendation	Management response, executive and deadline
		technology. The current reporting structure has security-related briefings being provided by the Network Security Manager to the Manager, Systems and Security Operations, who then informs the Director, ITS as required. There is a risk that the Director is not informed of important security messages on a timely basis with the existing communications chain.	B. Management agrees with the recommendation. Staff will ensure that the Network Security Manager has indirect reporting to the Director, ITS and that regular security updates will be provided to ITS management.
		Recommendation: The Network Security Manager should have an indirect reporting line to the Director, ITS to escalate security issues as required. Security updates should be provided to both the Director as well as Managers (the ITS management) on a regular basis.	Owner: Dave Mawby, Director ITS Due date: 2017 Ω3
		C. The Help Desk is not constantly staffed during standard working hours as Support Analysts may be in the field resolving incident tickets. End users who are unable to speak to Help Desk staff then reach out to other members of ITS, bypassing the standard call intake process.	C. Management agrees with the recommendation. Staff will complete a Lean review of the Help Desk roles and responsibilities in order to improve live- answer availability during all business hours.
		Recommendation: A Lean review of Help Desk responsibilities should be carried out. Consideration should be given to revisiting the staff assignment to ensure there is at least one Support Analyst at the Help Desk to take calls or walk-ins at all times during the standard working	Recognizing that this change may negatively impact other services, particularly during the summer months due to the annual technology roll out and vacation schedules, ITS will include a request for a



#	Risk	Recommendation	Management response, executive and deadline
		day. During periods of low call/walk-in activity, the Analyst could assist with	summer student during the 2018 budget process.
		other tickets in the queue or update the knowledge base.	Owner: Dave Mawby, Director ITS
			Due date: 2018 Q1
5	Medium	<ul> <li>Utilization of automation and system tools</li> <li>The IT department does not fully utilize available tools effectively to support daily operational tasks. This has been identified in several areas:</li> <li>The service management system is not used by all ITS members to log and track incident tickets and service requests;</li> <li>IT change management records and supporting knowledge documentation</li> </ul>	Management agrees with the recommendation. The ITS Branch is in the process of moving to the new service management platform. The ticketing function has been migrated however the implementation of additional features and functions has been delayed due to current staff vacancies. It is the intention of the Branch to continue to further leverage
		instead of a searchable database or service management system;	the service management platform to improve services and develop reporting
		<ul> <li>The Security Information and Event Management tool is not properly configured to collect and correlate incidents and events from system logs;</li> </ul>	metrics. Lean process reviews will be completed as services are migrated to the new tool. ITS will focus on change management functions and
		<ul> <li>Patching of servers is manually undertaken.</li> </ul>	documentation.
		Recommendations:	Owner: Dave Mawby, Director ITS
		The City has existing tools and systems	Due date: 2018 Q1
		automate some of the manual tasks, including setting up workflows for	Staff have recently received updated training on the City's Security Information and



#	Risk	Recommendation	Management response, executive and deadline
		incident and change management processes. ITS management should carry out Lean reviews of existing manual tasks. Subsequently, ITS management should investigate the additional functionality and tools available within existing systems, agree upon a standardized approach in the usage of the various functionalities and train ITS users on how to efficiently utilize them.	Event Management tool. ITS will be requesting additional funds from the Annual Technology Projects budget in order to purchase additional licenses and implement additional monitoring features. Owner: Dave Mawby, Director ITS Due date: 2018 Q3 Tools are in place to automate the deployment of Windows updates and global 3rd party software updates to workstations and will be used to automate server updates and patches. Owner: Dave Mawby, Director ITS Due date: 2018 Q1
6	Medium	Role of the Information Systems Steering Committee (ISSC) and Project Executive Sponsors The documented mandate of the ISSC, which includes evaluation of technology projects and oversight of the technology portfolio, is in line with good practice. However, the duties and responsibilities of the ISSC are not being fully executed. See Appendix B for further details. Not all stakeholders interviewed, who were at the Manager or Director-level, were aware of the existence of the ISSC,	



#	Risk	Recommendation	Management response, executive and deadline
		its mandate and its membership. As a result, the agreed-upon process for	Management agrees with the recommendation.
		prioritization of IT projects through the ISSC is not fully understood by stakeholders across the City and may have contributed towards the assumption that IT projects are prioritized	In the short term, focus will be put on communication regarding the ISSC, its membership, roles and significance.
		at ITS' discretion. It is also unclear if ISSC	Owner: CLT
		communicating the status of requested projects to their respective Departments,	Due date: 2017 Q3
		or if this is carried out by ITS.	A review of the corporate IT
		We also noted that Executive Sponsors from the Departments have been assigned to each project, although given the current status of the project, their accountabilities and responsibilities can be more clearly defined, in particular with championing the project and engaging	including the mandate and membership of the ISSC, and the roles and responsibilities of the business stakeholders as noted above will be included in the development of a new ITSP.
		with senior management.	The coordination and
		Recommendations:	the IT Project Portfolio and
		The mandate and membership of the ISSC should be revisited and confirmed by CLT. CLT members should be tasked with communicating the agreed-upon mandate to their Departments.	standardized project governance documentation will be a key focus area for the new Manager, IT Project Planning and Portfolio.
		ITS should provide ISSC with adequate	Owner: CLT
		information and documentation to discharge their duties and responsibilities, and address any feedback provided.	Due date: 2018 Q4
		Clarity should be provided as to whether ISSC members are responsible for providing their Departments with updates on matters discussed and	



#	Risk	Recommendation	Management response, executive and deadline
		decisions made at ISSC, or whether this is carried out by ITS.	
		For each project, the accountabilities and responsibilities of the Executive Sponsor can be more clearly defined (see Appendix C for typical roles of an Executive Sponsor).	
7	Medium	Key Performance Indicators	Management agrees with the
		Key performance indicators (KPIs) have not been defined by ITS to establish standards for service delivery and track and monitor performance for compliance with those standards. Without agreed KPIs that are tied to service level agreements with the business, end users may not have a consistent understanding of the service delivery standards which then contribute towards user dissatisfaction.	Branch is in the process of moving to the new service management platform. The previous platform did not provide reliable metrics to enable performance or capacity reporting. The ability to develop and report on future KPIs is a key consideration as business processes are reviewed and
		Recommendations:	migrated to the new tool.
		We recommend KPIs be developed in collaboration with business service level agreements and approved by senior management. These should include both internal and external KPIs such as average time for incident resolution, number of defects raised on a system, aveilability and appacity targets. Tracking	Service levels and KPIs will be developed over time. Staff will develop an initial set of metrics related to incident case management. Owner: Dave Mawby, Director ITS
		and monitoring should be established and reported upon to provide ITS and non-ITS staff with visibility into the performance of ITS.	Due date: 2018 Q2
8	Low	Knowledge base and documentation repository	



#	Risk	Recommendation	Management response, executive and deadline
		During the review KPMG found limited documented knowledge retention, which results in reliance on specific staff members to support applications and infrastructure and a higher risk of core knowledge being lost as a result of turnover or retirements. There is no central repository that is used across ITS as a knowledge base (e.g. resolution steps for frequent issues) or for	executive and deadline Management agrees with the recommendation. ITS system documentation currently resides on the Branch's shared network drive. Staff will review contents and structure of the drive to ensure that the information is properly organized. Owner: Dave Mawby, Director ITS Due date: 2018 Q1 Staff will review systems documentation and develop appropriate standards and templates, and will identify
		maintenance of key documentation. <u>Recommendation</u> :	Owner: Dave Mawby, Director ITS
		ITS management should require staff to	Due date: 2018 Q1
		document key processes and retain them in a central repository where they can be shared between teams while maintaining version control.	Staff will review systems documentation and develop appropriate standards and templates, and will identify the appropriate centralized repository for the information.
			Owner: Dave Mawby, Director ITS
			Due date: 2018 Q3
			Staff will review current practices to ensure that case notes and resolutions are being properly documented.
			Owner: Dave Mawby, Director ITS
			Due date: 2017 Q4



# Appendices

# Appendix A: Summary of IT organization structure

In line with the objectives of the scope, we have assessed the current ITS structure and how roles and responsibilities have been defined and assigned to support delivery of IT services at the City. We also assessed if the future state IT function should evolve to better meet emerging or additional needs. The following table sets out our findings through inspecting documentation and inquiring with different stakeholders.

# Findings The current structure of ITS and planned roles and responsibilities are in line with other IT organizations. The Network Security Manager does not have a reporting line, direct or indirect, to the Director, ITS (Recommendation 4). Business Analysts have to fulfil operational support responsibilities, act as project managers as well as undertake "business analysis" (Recommendation 2). The Help Desk is not constantly staffed during standard working hours as

 The Help Desk is not constantly staffed during standard working hours as Support Analysts may be in the field resolving incident tickets. End users who are unable to speak to Help Desk staff then reach out to other members of ITS, bypassing the standard call intake process (Recommendation 4).



### Screenshot 1 – ITS Organizational Structure





# Appendix B: ISSC structure and role

In line with the objectives of the scope, we have assessed the role of the Information Services Steering Committee (ISSC) and how ISSC supports the prioritization of ITrelated projects. We have commented on our findings through inspecting documentation, and inquiring with different stakeholders.

#### Findings

- ✓ The mandate of the ISSC is in line with good IT governance practices.
- The mandate of the ISSC is not being fulfilled as members of the ISSC are not executing the duties and responsibilities set out in the IT Governance Framework (**Recommendation 6**).

**Mandate of the ISSC:** Chaired by the Director, ITS, the Corporate Information Systems Steering Committee (ISSC) is responsible for defining strategic directions for corporate information technology systems and services. The Committee will recommend IT funding and evaluation, and make decisions regarding large scale investments within the context of the enterprise IT applications and infrastructure services portfolio.

The Committee is designed to promote a collaborative and transparent approach to delivering technology strategy, recognizing the shared responsibility for successfully leveraging technology.

The Committee will assist in setting technology expectations and provide feedback to ITS regarding its role in supporting the City's Strategic and Business Plans.

# Duties and Responsibilities per the Governance Framework and whether they are currently executed:

Duties and Responsibilities	Currently Executed?
Own and manage Corporate Technology	No. There is no current ITSP.
Strategy	
Champion the IT strategy and processes and	No. There is no ITSP and IT
communicate with management and staff	processes are not sufficiently
	documented to allow ISSC members
	to communicate with staff.
Receive, review, and understand requests	Partial. Department/Branches can
originating from their Department/Branch in	submit requests directly to ITS
the context of departmental and corporate	bypassing ISSC members. In
strategy	addition, the scope of some



Duties and Responsibilities	Currently Executed?
	Departments are so large that ISSC members may not be able to adequately review requests in the context of the department's strategies.
Develop annual IT Capital Budget	No. ISSC does not develop the annual IT capital budget, although the Director ITS discusses the budget and takes feedback from the ISSC.
Establish and recommend the criteria for evaluation of technology projects	Yes. A scoring framework has been established for the evaluation of technology projects.
Evaluate and provide oversight for the technology project portfolio	Partial. ISSC evaluated and reprioritized the technology project portfolio in 2016. Oversight duties are not being discharged.
Review and endorse (where appropriate, recommend) IT policy review	No. IT policies have not been drafted and submitted for ISSC review.
Review and endorse technical standards, proposed by ITS	No. Technical standards have not been drafted and submitted for ISSC review.
Review and approve work plans and priorities of Corporate Solution Working Teams.	No.
Review and provide feedback on strategic IT KPIs (financial, resource and infrastructure utilization, standards)	No. Strategic IT KPIs have not been defined.
Establish Technology Working Teams as required	Partial. Technology working teams have been set up in some areas and for project-specific requirements.

The Project Governance Structure is shown on the following pages.



#### Screenshot 2 – IT Change Requests Process Flow





#### Screenshot 3 – IT Governance Structure





# Appendix C: Roles of a Project Executive Sponsor

• Ensure the project's strategic significance and promote support by key stakeholders.

The sponsor endorses and defends the project as a valued investment of organizational resources, an investment that serves the organization's strategic objectives.

• Support approval and funding for the project.

Organizations have more opportunities than funds and people to work them. The sponsor lobbies for the approval and funding of the project, including additional funding if required.

#### • Resolve conflicts that require senior management involvement.

The sponsor resolves conflicts that require senior executive involvement: funding, priorities, external commitments, cross-organizational boundaries. The sponsor strives to buffer the project team from political issues. Timeliness to close issues is critical.

#### • Be accessible and approachable.

The sponsor must be available to the project manager and other stakeholders on relatively short notice. The sponsor should be viewed as a stakeholder who is always willing to listen and get involved as needed – to be used as a sounding board and to provide advice and guidance.

#### • Support periodic reviews.

The sponsor approves the need and frequency of project reviews to appropriately assess the health of the project and ensures any significant problems identified are addressed immediately.

#### • Support post-project reviews.

The sponsor promotes the implementation of reviews upon project completion or following a major phase of a long-running project. A post-project review identifies what went right, what went wrong and where improvement can be made on future projects. The objective is to learn from project experiences so future projects can benefit.

#### • Encourage recognition.

The sponsor, working with management and the project manager, supports the timely recognition of noteworthy individual and team achievements.



# Appendix D: Staff involvement and documents reviewed

We undertook interviews in March and April 2017 with key stakeholders to inform this work including:

Name	Title
Bev Hendry	Commissionner, Corporate Services
Dave Mawby	Director, Information Technology Services
Steve Patterson	Manager, Systems and Security Operations
Linda Mielewczyk	Manager, Applications Support
Adam Abernethy	Network Security Manager
Nancy Kavanaugh	Business Analyst
Shelly Crosby	Business Analyst
Thomas Kalampukattu	Business Analyst
Ryan Coglin	Business Analyst
Timie Awoleye	Support Analyst
Glenn Simmonds	Director, Operations Services
Mike Saulnier	Manager, Operations and Waste Management
Mike Sluggett	Manager, Traffic, Streetlights and Parking
Lisa Brown	Manager, Business Planning and Operations
Laurie Jones	Manager, Programs and Facilities
Catherine Richards	Manager, Culture and Central Recreation Services
Steve Boyd	Deputy Fire Chief
Derrick Clark	Fire Chief
Jim Naumovski	Manager, Facilities Operations
Julie MacIsaac	Director, Recreation and Culture Services
Beth Mullen	Manager, Strategic and Business Services
Dru Chillingworth	Manager, Parks Maintenance Services
Stephanie Sinnott	Executive Director, Finance Services/Treasurer



Name	Title
Dave Lyon	Manager, Purchasing Services
Michelle Bretherick	Manager, Financial Reporting and Planning
Tim Dwyre	Manager, Taxation and Revenue Services
Jay Martin	Manager, Financial Services and Systems Development
Tracy Adams	Director, Corporate Communications
Mark Robinson	Director, Facilities Management
Jerry Conlin	Director, Municipal Law Enforcement & Licensing Services
Andrew Brouwer	City Clerk
Brenda Jeffs	Manager, Customer Service
John Turpin	Project Manager, Facilities Management
Kevin Alexander	Manager, Capital and Technical Services, Facilities Management
Warren Munro	Director, Planning Services
Susan Ashton	Manager, Development & Urban Design
Jerry Shestowsky	Manager, Administration and Accessibility Services
Mike Leonard	Chief Building Official
Kyle Benham	Director, Economic Development Services
Brett Murphy	Manager, Marketing and Investment Attraction
Patrick Lee	Director, Engineering Services
Anthony Ambra	Manager, Design and Construction Services
Melissa McCabe	Manager, Infrastructure Services

We received the following documentation over the course of fieldwork:

- IT organizational chart, including roles and responsibilities, and job descriptions
- Current IT Strategy and plans for future update
- IT Policies, standards, processes and procedures
- IT Risk assessment standards, methodology, processes, tools and current IT risk report/register



- IT outsourcing agreements and associated risk management, vendor/service level management documents
- List of technology-enabled projects: planned, current and those completed in 2016
- (IT) Project Management standards, methodology, processes
- Systems development standards, methodology, processes
- List of Committees/Bodies where IT matters are discussed (strategic and operational), and their Terms of Reference
- Application and infrastructure landscape



Item: CORP-20-17 Attachment 4

Survey Report ember 2019 - 21 November 2019

# Information Technology Services Plan Feedback Form

PROJECT: Information Technology Services Plan Connect Oshawa



# **Current Online Services**

1. How do you typically access our current online services?

Desktop	7 (29.2%)
Laptop	8 (33.3%)
Tablet	3 (12.5%)
Phone	6 (25.0%)
Other:	0

**2.** How often do you use City services online?

Online Services	More than once a day	Daily	Weekly	Monthly	A few times a year	Once or less a year	Have not used service
activeOshawa - online program and camp registration	1	0	0	5	7	1	10
Agendas and Minutes of Council and Committee meetings	0	1	2	6	6	2	5
Apply for a job	0	0	1	1	1	3	15
Apply for a marriage licence	0	0	0	0	1	1	21
Book a marriage ceremony	0	0	0	0	0	0	23
City of Oshawa website (oshawa.ca)	1	3	4	8	7	0	0
Community Events Calendar	1	0	5	6	10	1	0
Connect Oshawa engagement website (connectoshawa.ca)	1	0	2	8	8	1	3
Council and Committee Meetings Calendar	0	1	4	3	5	4	5
Durham Region Waste app	0	0	9	6	4	0	4



#### Information Technology Strategy Feedback Form

Online Services	More than once a day	Daily	Weekly	Monthly	A few times a year	Once or less a year	Have not used service
Interactive Maps to search for locations and places of interest in Oshawa	0	1	1	4	8	2	6
Live Chat	0	0	0	1	1	3	18
Occasional Use Parking Permit	0	0	0	1	1	1	20
Online pet licence	0	0	0	0	1	2	20
Open Data	0	0	2	0	1	6	14
Pay a parking ticket	0	0	0	0	1	5	17
Recreation facility computers	0	0	0	1	0	0	22
Service Oshawa Online (serviceoshawa.ca)	1	0	1	3	7	3	8
Snow activity reports	0	0	2	0	5	1	15
Subscribing to News and Alerts (oshawa.ca/subscribe)	1	3	1	2	3	3	10
Waste online services - collection information and large item collection booking	0	0	0	1	7	7	8
Webcasts of Council meetings	0	1	0	3	4	3	12
Wi-Fi at recreation facilities	0	0	2	8	3	1	9



#### **3.** What do you think of our current online services?

Online Services	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Dissatisfied	Unsure	Have not used service
activeOshawa - online program and camp registration	7	1	6	0	1	1	8
Agendas and Minutes of Council and Committee meetings	4	6	4	2	0	0	6
Apply for a job	2	3	2	1	0	1	13
Apply for a marriage licence	1	1	1	0	0	1	18
Book a marriage ceremony	1	1	1	0	0	1	17
City of Oshawa website (oshawa.ca)	11	6	4	0	1	0	0
Community Events Calendar	10	4	2	1	3	2	1
Connect Oshawa engagement website (connectoshawa.ca)	9	2	3	1	1	1	6
Council and Committee Meetings Calendar	4	6	6	0	0	1	6
Durham Region Waste app	11	2	2	0	0	1	6
Interactive Maps to search for locations and places of interest in Oshawa	7	3	3	0	1	1	8
Live Chat	1	1	3	1	0	0	17
Occasional Use Parking Permit	2	0	2	0	0	1	18
Online pet licence	2	1	1	0	0	0	18
Open Data	3	1	3	0	1	3	11
Pay a parking ticket	2	2	2	0	0	0	16





Online Services	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Dissatisfied	Unsure	Have not used service
Recreation facility computers	3	1	2	0	0	0	16
Service Oshawa Online (serviceoshawa.ca)	7	2	4	1	1	0	7
Snow activity reports	4	3	2	0	0	1	12
Subscribing to News and Alerts (oshawa.ca/subscribe)	8	3	2	1	0	1	7
Waste online services - collection day information and large item collection booking	7	6	1	0	0	2	6
Webcasts of Council meetings	2	3	3	1	0	1	11
Wi-Fi at recreation facilities	7	2	2	0	1	0	10

**4.** Please provide your comments or suggestions about any of the services listed above that you have used:

Not present in this list are communication methods for city council or response times from councillors or staff for queries. "Online" services should be a convergent point. That is, everything is included in the meaning of "online" including email, messaging, alerts, etc.

I appreciate the information being extended to engage in the activities that are taking place with regards to the regional, and municipal planning, as well as recreational in and around our community. Updates on closures of roads or services allow me to plan accordingly. The city news, that is provided is current and allows for options such as this survey, job postings, infrastructure plans, future as well as ongoing and past success or cancellation of projects. I'm happy with the services. Didn't actually know about some of them. I do now, thanks!

New OSCC55+ website still has some issues that were reported and should have been fixed by now. An example would be course names missing from the My Courses page. Only the first course has a name. The others are missing. Additionally, it can be difficult to find the course you are looking for. Short verbal surveys of people at seniors events could provide good feedback to the development team. Additionally, it would be great to be able to pay for renewed swimming and other memberships online on the ActiveOshawa site.

More information about what materials are recyclable on the website would be helpful. Love the ease of use for booking large item pickup and checking garbage day.



It appears that not all the events make it to your calendar as I see city events posted on other social medias that were not listed on your calendar.

I have used ServiceOshawa.ca and Oshawa.ca a reasonable amount of times since moving to Oshawa in 2016. I find the sites easy to use and easy to get around.

I am taking particular interest in this topic because it involves the Connect Oshawa website (connectoshawa.ca). I have a number of complaints about this site. 1. The Terms and Conditions (https://connectoshawa.ca/terms) are grammatically incorrect. This appears to have been corrected in t the past few days. I have made a number of complaints about this online and with city councillors. Other issues still remain. 2. The Terms and Conditions grand 3rd party service provider (Bang the Table) the right to modify or delete any content on the site "in its absolute discretion". These are the terms that govern the online feedback system. This is a conflict of interest with this particular ITSP as it covers the Connect Oshawa site itself. Bang the Table has "absolute discretion" to modify or delete any content that is going to be used to make decisions that affect future contract that it might have with the City of Oshawa. 3. Other sections of the Terms and Conditions absolve Bang the Table of any responsibility to ensure the Connect Oshawa site is functional, secure, error-free, accurate, reliable, of suitable quality to meet expectations, or meets any requirements. They have no responsibility to correct any software errors. The detail and exactness of this release of any professional responsibility was particularly annoying considering that a previous section granted them absolute power of any data on the site and wasn't even grammatically correct. 4. How is this online feedback used when making decisions for the city? 5. Do the city officials using this feedback understand that the data may have been modified by a 3rd party, may have been submitted by anyone on the internet, and was collected under the conditions described above? A city councillor sent met he fees paid by the City of Oshawa for these services. They are approximately \$22,000/year. I think these prices are a good value for this service. Collecting this information from the public is challenging in many respects. My overriding concern is how this feedback is used by city officials and whether they are aware of the limits of its validity that are inherent in any kind of online poll or feedback.



# **Prospective Online Services**

We are considering introducing new services online.

5. Which of the following prospective new online services is most important to you? Rank the 10 you believe to be most important of the list, where 1 is your most important selection. Please use each number only once.

	Rank
Apply for grants	7.82
Book appointments (e.g. inspections)	5.92
Computer kiosks at City facilities that would allow access City services	12
and websites	
Dispute a parking ticket	8.5
Event / filming permits	10.57
Expanded Open Data	9.44
Expanded public Wi-Fi downtown	5
Expanded public Wi-Fi in additional City facilities and parks	5.81
Find my plow - monitor snow-plow progress and weather conditions	6.47
Make a Freedom of Information (F.O.I.) request online	11.75
Make City payments online (e.g. fees, fines, taxes, etc.)	4
Municipal election voting	5.31
Online building permits (e.g. pool, deck, building, demolition)	9
Online business licences - apply and renew	9.67
Online fire permits (e.g. open air burn permit, fireworks, etc.)	10.57
Online planning applications (e.g. variance, severances, development	9.63
applications)	
Property ownership change notice (i.e. tell us of an ownership change)	6.89
Rent a City facility, sportsfield, ice	10.44
Road-related permits (e.g. excess load permits, curb or culvert	11.2
Submit all City forms onling (vs. downloadable P.D.F. forms)	6 38
Submit City Council and Committee requests online (o.g. delegation	10
submit City Council and Committee requests online (e.g. delegation	10
Submit proclamation request	12.67
Tax account online (or track account status, nowmant history, satting up	7
and altering pre-authorized navment plan)	1
Tax certificate	10 80
	10.09



## **Other Suggestions**

**6.** Are there any other ways that you wish to share with us about how we could use technology to improve customer service?

Councilor interaction/ request. Utility complaints, compliances being enforced where easment violations are unanswered by utility services such as the service boxes being left open, wires not being buried correctly and draped across fences or left on ground unprotected.

NO to municipality voting online, I'd rather see scan tron style machines (like city of Toronto uses) so that votes can be quickly tallied but a paper trail remains. I don't believe the extra convenience of doing it online is worth the security concern.

I am sorry but in both pages I don't know what the term in this survey 'Open Data' means. Does it mean opening data pages, getting data that's free or open, downloading pages, what does it mean? Also, on this page, it's very hard to pick out rankings when first one has to even pick the things that one might use in a year, and one has to scroll a lot to see them all. Until one picks ten out of 23, one can't know what the ranking is going to be so this form of survey is a lot of work. Either one uses pen and paper or one picks numbers randomly as I did and then has to change a bunch of numbers around by picking higher than ten so the number you want then gets freed up. Better to have them so one can see them all on a graph on one page with the ranking to the right so one doesn't have to scroll up and down to see what are all the items and then return through the list again to rank them all, which also takes time. Thanks.

The homepage of Oshawa.ca is a static page with limited functionality. For example, Windows 8 had a metro platform. Information was laid out, one click. Information presented easily. On Oshawa.ca I have to click too many times to search for what I want. Everything is compartmentalized. You have spend hours to navigate.

1. Rely more on mobile apps and less on the website. 2. Review the Service Oshawa site. It appears to be non-functional. See https://service.oshawa.ca/site/oshawav3/redirect-service-oshawa/1000151 "HTTP Status 500 - Could not connect to HTTP invoker remote service at

[https://lagan.oshawa.ca:443/lagan/remoting/AuthenticationManager]; nested exception is java.net.ConnectException: Connection timed out; connect" 3. It is too difficult to submit complaints regarding safety issues such as uncleared sidewalks. I am going to attempt to report any significant snow clearing issues I find downtown this winter and track how much time I spend.

# **Demographics & Community Engagement Evaluation**

Oshawa<sup>®</sup>

Thank you for participating. Your feedback is very important to us. We would appreciate if you could please complete this Community Engagement Evaluation form.

- **7.** How old are you? 0 12 and under 0 13 - 170 18 - 24 2 25 - 344 35 - 44 7 45 - 544 55 - 64 6 65+ 8. Are you an Oshawa resident, and/or Oshawa business/property owner? 23 Yes 1 No 9. If you answered yes to **Question 8**, what does your postal code begin with: 9 L1G 0 L1H – North of King St 5 6 L1J L1H – South of King St 2 LIK 1 L1L **10.** If you answered yes to **Question 8**, what ward do you live in / is your business/property located in: 4 Ward 1 Ward 2 6 3 Ward 3 9 Ward 4 1 Ward 5 0 Don't know **11.** How did you learn about this community engagement opportunity? Select all that apply. 1 0 City Facility City of Oshawa website 4 Connect Oshawa Website 15 Email 0 Letter/flyer 2 **Oshawa Express** 
  - 5 Social Media 0 Word of mouth

Oshawa This Week

0 Other

1

Poster

0



12. How could we improve future community engagement opportunities?

#### door to door

Oshawa and Durham region have a remarkable web sites, easy to search for current information, with opportunities to be informed and connect.

Improve Social Media. Follow the rules of Social Media ie: it does not turn off at 5pm.

Stop doing surveys where you ask the age and then lump all a whole category of people together at 65+. I'm personally trying to wake up governments and others doing surveys to say that it's insulting to break down the whole population by decades and then lump 35 years of ages together in 65+. It's an antequated survey idea that assumes all those people either don't work or think the same. Obviously the world has changed and we now know that this category has as many different needs or attitudes or opinions as the other decades. Why does 35 - 45 rate a category but 65 - 75 does not? Thanks.

There should be a better explanation of City Council meetings and agendas. I am particularly interested in this IT strategy, but I have no idea what is happening with this feedback, what happens next, or what other opportunities exist to find out more. I suppose I can get my city councillor to explain it, but more people might take an interest if City Council activities and events were more clearly described on the website.

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree
I understand how my I.T.S.P. consultation feedback will be used.	15	3	2	2	1
I have a good understanding of the I.T.S.P. consultation based on the information provided in the feedback form.	13	4	2	2	1
I feel the feedback form was a good opportunity to participate in the I.T.S.P. consultation.	17	3	2	1	0
I understand the next steps in the I.T.S.P. consultation and timing going forward.	13	0	5	1	2

13	Please	rate	the	following	statements.
10.	1 16036	Iaic	uie	TOHOWING	statements.



# Corporate Information Technology Strategic Plan



# **Findings and Future Directions**

October 18, 2019



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# **Executive Summary**

The internet and the smartphone over the last decade have changed people's expectations and interactions with technology.

Customer expectations of service are now heavily influenced by their interactions with leading digital firms such as Netflix, Amazon, Indigo, and with their bank or grocery store. People can pay taxes, renew their health card and buy their vehicle license sticker online. Increasingly the 88% of Canadians that bank online<sup>1</sup> expect to be able to interact with their City in the same way.

Staff too are influenced in the same way and they expect to be able to use simple and easy to use tools and technologies at work to submit requests and seek approvals, to book vacation to collaborate with people inside and outside the organization – to get work done - where and when they need to.

Underpinning all of these expectations are technology capabilities. Quite simply, it is impossible in 2019 to be an effective and efficient municipality without integrated technology anchoring and powering the organization. High-quality customer service, operational efficiency, and staff productivity depend upon it.

Perry Group Consulting was engaged to develop a future-looking Corporate Information Technology Strategic Plan for the City. This is intended to be a corporate-wide look at how the City can leverage technology to be a better, more effective organization - not an IT Branch plan.

Good strategy comes from fully understanding the current situation and developing clear actions to address key challenges and opportunities to move forward. So, we begin with a current state assessment. This report presents the findings from our current state assessment and outlines the suggested priorities, future directions and decisions required that will continue to be evolved in the next stage of the development of the strategy.

The City plans to bring the finalized Corporate Information Technology Strategic Plan to Corporate Leadership Team (CLT) and then on to the Corporate Services Committee.

The results of the current state assessment of the technology situation at the City suggest that there are a number of positives on which to build, including:

• While there are some areas for improvement and despite some recent annoyances (e.g. Surface devices and Wi-Fi connectivity), the City's technology infrastructure is largely in good shape, staff typically have modern devices, the technology is reliable and with recent changes staff can work flexibly and remotely.

<sup>&</sup>lt;sup>1</sup> Canadian Banking Association - https://cba.ca/technology-and-banking
- The IT Branch's responsiveness, and ability to react through its helpdesk function appears to be working well and is widely well regarded.
- The City has done some excellent work in the Customer Facing services area, in
  particular in the implementation of the Lagan CRM and in delivering web and
  integrated digital services such as the ability to submit service requests online,
  apply for road occupancy permits, request and renew pet licences and check on
  road closures. This is a strong foundation for future expansion of digital customer
  services.
- The City has made major commitments and investments to modernize core Enterprise systems – in particular through the Maximo and CityView projects and the recently live new Intranet.

However, despite these positives, more broadly speaking we see the overall technology situation at the City as challenging. We found that:

- There is greater demand than there is capacity for technology and businesstechnology projects at the City and existing IT governance processes are not able to effectively match or balance supply and demand; this is creating a vicious cycle of frustration at all levels, within the IT Branch, at CLT and within business units; this cycle must be broken.
- There are important IT Branch service management process improvements that should be made to the way that IT operates. Today there is too much ad-hoc, reactive work and insufficient long-term planning and strategy work. Common internal processes could be standardized and streamlined. Implementation of these recommendations will require resources to achieve in the short-term but will lead to efficiencies within the IT Branch over the medium-term.
- The IT Branch is significantly under-resourced compared to peers. Notwithstanding efficiencies that could be gained, there is significant scope for the addition of IT resources based on the City's current experience, future needs and based upon comparison with industry and municipal-peer benchmarks.
- Branches are looking for more help from the IT Branch in identifying how technology can help them be more effective – they are looking for the IT Branch to be a partner; but the IT Branch does not have the available resources to effectively fulfill this function. To address this, the IT Branch has re-structured and repurposed the two webmaster roles and some existing systems analyst roles and is using these resources to unsuccessfully attempt to fill this gap, however in borrowing from one area to address a gap in another results in neither function being fulfilled well.
- The City's Business Solutions space is the key area that has not been meeting the expectations of modern, simple and self-service experiences, and is the area where the City faces significant work over the medium-term. A number of

overdue, extremely large and significant, resource intensive and change management heavy initiatives such as LMS (CityView) and WMS (Maximo) are underway. Necessary tax systems replacement and CRM upgrades are likely to significantly tax the organization if they are tackled while LMS and WMS are also underway.

- Meanwhile, other major work is ahead too significant improvements to HR and workforce management processes within the HCM area will be essential for the City to be able to effectively manage its largest and most costly assets – people – and to reduce time spent on one of the most administratively intensive processes at the City – payroll and scheduling. The City currently lacks modern collaboration capabilities, relying on file shares and file forwarding – implementation of an ECM solution (also identified by the Information and Records Management Strategy) for enterprise collaboration, document and record management, improved search and discovery are much needed.
- Note that increasingly each of the projects that the City tackles are corporatewide initiatives that require the most effort and change management support for successful adoption. For these types of corporate-wide initiatives, CLT and business leaders understanding, ownership and commitment to such technologyenabled transformation initiatives needs to be developed further if the City is to truly be successful with achieving the desired business transformation.
- Data, Analytics and Visualization and systems integration are areas that represent a significant opportunity. The data space has been largely untapped at this stage, although some pilot work in the area of Open Data has started. Opportunities abound to measure and monitor, understand and optimize service delivery using data that the City already collects and will collect in future. Responsibility for this area is currently un-defined and responsibilities are in several Branches; work to drive activity in this area, beyond the GIS, is also largely un-defined and under-resourced (this issue has also been highlighted by the Information and Records Management Strategy).
- Effectiveness of project definition and delivery could be significantly improved, and projects need to be championed, led and resourced better to ensure achievement of agreed outcomes. The practice of funding project staff and backfilling project resources for project is only recently being introduced and has not yet become a standard practice.
- At the root of the problem beyond the funding and resourcing issues already discussed – we believe there is a need for Management and Council to decide what type of IT function and service the City needs going forward, what role the Branches have with regard to business transformation, and how the relationship between IT and Branches should be managed.

- In this context, particular questions regarding the role of the IT Branch with regard to the following areas need to be answered:
  - Solutions, Data and Technology Architecture
  - Business Analysis business process review and design assistance, requirements development, business case development
  - Project Management of Business Solutions projects
  - Leadership and coordination of GIS strategy and GIS work
  - Leadership and coordination of Data strategy, Business Intelligence and • Data Analytics work
  - Smart City
  - Innovation programs

This document surfaces ideas and suggestions in each of these areas.

At this stage of our work we have identified and suggest the following theme areas and key initiatives for the City to focus its technology work upon over the next 3-5 years:

- 1. Digital Services for Residents and Businesses (including Planning, Permits, Licences, Digital Plans, eForms, ePayments)
- 2. Fully Utilized Business Solutions, supporting full end-to-end processes (including Maximo, CityView, Agenda Management, HCM, Tax, PeopleSoft Financial and Asset Management and asset decision support)
- 3. Mobile Tools for the Mobile Workforce (including the rollout of Maximo and CityView mobile capabilities, also mobile technologies in Municipal Law Enforcement, Fire and other Branches)
- 4. A Modern Workplace for a Modern Workforce (including Intranet, Office 365, ECM, modernized fleet of devices and embrace of flexible and remote working)
- 5. Becoming Data Informed and Data Driven (including Data and GIS Strategies, AVL, Datawarehouse, Analytics and Dashboards, Open Data/Community Data)

In addition, the following key ideas, which are designed to create the conditions to ensure their successful achievement, are suggested;

1. Commit to a new mandate for the IT Branch to operate as a Trusted Supplier growing into a Partner Player (a concept which is discussed further in subsequent sections).

If this approach is accepted, then the City must:

Clarify the responsibility of Branches and business unit owners for leading business transformation, process design, change management and business solutions training, amongst other responsibilities.

Partner player

Trusted supplier

Solid utility



IT is integral to how we do

be a trusted supplier.

husine

**business:** IT organization is expected to closely partner with the business to help identify, plan and deliver significant

IT delivers critical functionality and

on budget, based upon the operating units requirements and priorities - plus be a solid utility.

services: IT organization is expected to deliver application projects on time and

s transformation initiatives - plus

- 3. Increase overall technology investment, seek out new sources of funding and prepare for a transition from capital to operating funding requirements.
- Increase the availability of IT Supply by building a high performing IT Team, establishing a stronger IT management team, elevating the IT Director role, investing in internal IT resources and using the market to augment internal resources.
- 5. Implement a revised governance model, at the CLT level that realistically works to effectively manage demand, with the goal of balancing supply and demand
- 6. Become a more tech savvy organization through education at the leadership level and improved training for the workforce.
- 7. Improve project outcomes through changes to the way that the City scopes, justifies, plans, executes, budgets and resources projects.
- 8. Focus upon quantifying and demonstrating business value achieved from investments in technology for the benefit of its customers (Council, staff, public).
- Implement a range of IT service and service management improvements to improve the efficiency and effectiveness of the team and to reduce the volume of reactive and unplanned work within the IT team.

# **1.Introduction and Background**

# **1.1 The Importance of Technology to Municipalities**

Why is Technology, and thus this Corporate Information Technology Strategic Plan, important to the City?

The City today is already heavily dependent upon technology. Technology is central to the City's ability to deliver services as diverse as collecting taxes, parking enforcement, dispatching fire crews, handling customer enquiries, and managing recreation program registrations. All of these services today rely on technology to operate effectively – and they would be significantly more costly to deliver without technology.

While email and smartphones keep every part of the organization connected, it is the business solutions such as Intelligenz that allow managers and staff to optimize program registration processes, or PeopleSoft and FMW that handle budgets and financial reporting.

Technology will play a major role in connecting separate parts of the organization – whether across departments, or from customer service representative to road or parks crew. Using common, integrated systems should ensure that inquiries flow from front



Figure 1: Connecting Customers and Staff Using Common Technology

counters to the department and to appropriate field staff for resolution.

Moving forward, technologies should support the "no wrong door" customer service approach – allowing customers to choose the channel (smartphone, web, telephone, face-to-face) through which they interact with the City. Common systems (as illustrated in Figure 1) should create a consistent view of the customer for customer service representatives and frontline, back office and field staff and allow for simple dashboards and data analytics to support Management and Council in the monitoring and oversight of service quality.

These tools working together can enable the City to maximize its operational efficiency.

Looking to the future, it is anticipated that the importance of technology will only continue to grow, and grow increasingly rapidly, in importance. More and more customers will expect to use their computers, phones and tablets, and perhaps voice

assistants to interact with the City, to make an inquiry, report a problem or apply for permissions. Increasingly sensors will be used to monitor critical infrastructure throughout the City and notify staff where problems are anticipated or have occurred.

Successfully managing the introduction and fully exploitation of these new technologies – allowing the City to deliver improved services, with less – is a critical organizational capability for the City.

# **1.2 The Importance of a Corporate Information Technology** Strategic Plan

So, given this ever-increasing importance of technology and its role in delivering municipal services, the Corporate Information Technology Strategic Plan is a crucial piece of work.

It should help the City (ask, and) answer, important questions about its technology:

- Is the Information Technology environment properly managed, maintained, secured, and able to support the needs of the City?
- Is the IT service cost effective?
- What are the City's future business needs?
- Is the technology environment, and our resources and management practices equipped to meet current and future business needs?
- Are business units equipped and in a state of readiness to drive forward business transformation?

Amongst the many opportunities that the City is bombarded with, the strategy must help the City determine its priorities and identify the key initiatives and activities that will support the City's strategic goals and objectives.

# **1.3 Oshawa Strategic Plan Linkages**

The City of Oshawa's 2015-2019 Oshawa Strategic Plan (OSP), "Our Focus, Our Future", affirms an emphasis on balancing the "wants and needs to be visionary, long-term thinkers and [a City that] makes fully informed decisions with all facets of society and future generations in mind"<sup>2</sup>.

Although we expect the OSP to be updated in the near-future, we would suggest that being visionary, long-term has strong links to the technology and data. Truly visionary government agencies have embedded the concepts of digital, smart and community data into their strategic planning work, and we would encourage the City as it continues to work on its next strategic plan to embed digital concepts and goals within the plan.

<sup>&</sup>lt;sup>2</sup> City of Oshawa's 2015-2019 Strategic Plan (<u>https://www.oshawa.ca/city-hall/resources/OSP\_Access\_2015\_2019.pdf</u>)

There are several important connections that can be made between the stated strategic goals and technology solutions either already in place or under consideration for the future.

#### Financial Stewardship

- Efficient and effective work processes are dependent upon the digitization of processes, the enablement of mobile work, the elimination of duplication and waste achieved through the implementation of digital solutions
- The adoption of digital services over alternative channels can lower overall service delivery costs (online services typically cost \$1 per transaction, phone cost approximately \$15 and face to face cost \$30).

#### Accountable Leadership

- Increased transparency around City operations through Open Data and Open Government programs
- Using data to support corporate performance management
- Sharing information with the community about performance metrics and targets.

## Social Equity and Cultural Vitality

- Accessibility services for the City's website and access to City services online and via Live Chat
- Online GIS web mapping and open data provide access to community assets
- Bang the Table as a means of facilitating community engagement through an online platform
- TeachingCity is a collaboration that can expand on the City's capacity to deliver things like augmented reality walking tours (on-going pilot), community engaged scholarship (City Idea Lab) and research designed to support a more healthy (Active Transportation for an Age-Friendly Community Research Study) and socially conscious community (Justice Hub, Indigenous Cultural Workshop).

## **Environmental Responsibility**

- GIS and mapping data collection and visualization does and will play a key role in building a virtual representation and understanding of City's environmental and built form
- Better data leads to more informed decision making which will allow for more exact measures to preserve and enhance natural assets
- Work order and asset management are crucial to the protection of natural resources and sustainment of a "rich natural environment".

Within the current City landscape, data and technology are implicit in delivering on corporate strategic objectives.

For future iterations of the City's OSP it is important for everyone involved to recognize that technology is no longer something that a single Branch *does* to an organization – there needs to be a deliberate cultural shift that takes place to help root digital tools and attitudes into strategic discussions and plans.

# **1.4 Acknowledgements**

Perry Group would like to acknowledge the cooperation and support of Council, Management, City staff and stakeholders throughout the development of this current state assessment.

# 2. Current State Assessment

Before developing any future looking strategy, it is important to take stock of the current situation. Where are we today? Does our current situation support our future goals? If not, how far away are we from where we want to be?

This section of the report presents our assessments of:

- a) The current state of the City's technology systems.
- b) The City's current approach to managing its technology.

# 2.1 Introducing the Municipal Technology Maturity Model (MTMM)

Perry Group's standardized Municipal Technology Maturity Model (MTMM) which is shown in Figure 2 below was the basis for evaluating the City's technology environment.



Figure 2: Municipal Technology Maturity Model

This is a generalized, conceptual municipal IT model, developed with Ontario municipalities over the last 10 years. The MTMM introduces several key concepts that are important for the City at this time, including:

- There are 4 main technology layers (labeled in Figure 1 as: Infrastructure, Business Solutions, Integration and Data, Customer Facing). Each requires discrete IT skill sets to be managed effectively. For instance, while technology infrastructure management is deeply technical, project management around business solutions projects requires project experience, change management and soft skills. Data architecture and data analytics skills are needed in the Data and Integration layer. An IT organization needs a breadth of the right skills in various domains to effectively manage the complete environment.
- The Infrastructure layer is the foundation for the entire technology environment. Infrastructure must be robust and reliable because it provides the basis for all other layers. Unreliable or inaccessible infrastructure undermines all the technology that sits above it.
   Appropriate policies, security, data protection and disaster recovery provisions should be in place. In an ideal situation, the IT team will need appropriate tools to help manage the environment including: a helpdesk request tracking system, a set of systems management solutions and automation tools (e.g. remote support, patch management, mobile device management) to simplify IT management tasks, increase productivity of IT staff and to enable employee self-service (e.g. password resets).
- A municipality should limit the number of corporate Business Solutions platforms it runs to reduce process and information silos. These business solutions provide the foundations for automated and streamlined business processes. They will gather data to drive analytics capabilities and underpin the effective delivery of online services.
- Business Solutions should be integrated allowing for data to be automatically passed between solutions (using integration technologies), thus reducing data duplication and errors, and ensuring auditability.
- The customer facing layer should deliver seamless, end-to-end online services that simplify the customer's experience of interacting with the City, reducing the number of visits to City Hall and facilitating self-service where possible. The IT architecture should typically build from the bottom up – infrastructure first, then business systems and so on.

These are some of the basic tenets that a well-planned, consciously designed technology environment should operate under.

# 2.2 MTMM Assessment Results

Perry Group reviewed the City's technology against the MTMM. The MTMM diagram in Figure 3 colour codes the results of the review.



Figure 3: MTMM Assessment Results Visualization

Whilst the green components in the diagram identify that there are a number of positives upon which to build there are also a number of gaps, risks and areas that require work. The following section highlights key points in each layer of the MTMM.

# Infrastructure

#### **Positives:**

- The technology infrastructure in general is seen to be reliable.
- The City's partnership with the Oshawa Power (OPUC) means that there is great connectivity to most City facilities, creating a solid foundation for the technology environment and for digitization.
- The City offers modern device choice options to staff (Surface Pro, iPhones, etc.) and has implemented a best-practice three-year lifecycle, lease model on devices.
- The City has recently implemented improved remote access options (in Direct Connect) which provides a solid foundation for remote, mobile and home working.
- The City has implemented follow-me printing which provides flexibility to staff and efficient paper and ink use.

#### Key Issues:

- Although the City has a good asset replacement lifecycle for devices, frustration exists in ensuring that new device needs particularly mobile needs are being addressed and ensuring that they are the right devices (mobile, laptop, etc.). This suggests that there is an opportunity to review the effectiveness of the current process.
- The assessment identified key risks and exposures related to Disaster Recovery, Business Continuity and additional work is required to develop a formal IT Systems Security program.
- The limited capability of the IT Service Management tools (Spiceworks) implemented within the IT Branch hinder the team's ability to deliver effective internal IT process management.
- There is a lack of an effective data / storage management strategy, which results in challenges to store, retrieve and efficiently archive content on file servers (note that this is also linked to the lack of an ECM solution, which has been flagged by the Information and Records Project Management project assessment).
- There are a lack of important corporate IT policies and standards to guide technology infrastructure provisioning and decision making (such as an Information Security Policy, a Disaster Recovery Policy).
- There is some evidence that indicates a lack of an effective planned lifecycle management around core IT infrastructure (e.g. lengthy core Switch lifecycles).
- The Boxer app (BYOD email app) widely viewed negatively by users.

# **Business Systems**

## Positives:

- The City has invested in a number of strong, Tier 1 business solutions that should be good foundations for future process digitization, these include: PeopleSoft, Lagan, eSolutions and ESRI.
- The City is investing heavily in modernizing existing systems with solid, modern industry leader solutions including CityView and Maximo.
- The City has replaced its recreation systems with a modern solution in Intelligenz and a new Intranet system has also recently gone live.
- Implementation of mobile technologies in MLELS appears to be working well and is a good template for future mobile initiatives.

## Key Issues:

- A significant proportion of the Enterprise applications the City relies upon are either in the process of being replaced (e.g. CityView, Maximo) or will need to be (e.g. HCM).
- A new roadmap and a series of enhancements to the City's Finance system (PeopleSoft) is required to fully leverage and modernize financial management processes.
- There is a key gap in the lack of an ECM (Electronic Content Management)/ Document, Records and Collaboration solutions, and attendant program, processes and standards to support their effective implementation and utilization.

- Critical expert systems for the City, including Manta Tax (the key source of tax revenue) must be replaced.
- An Agendas and Minutes solution is required.

# **Data and Integration**

## Positives:

- An extensive number of point-to-point systems integrations have been implemented allowing data to flow between various systems (including between Lagan, OLI, PeopleSoft, GIS, and Intelligenz), reducing manual data entry, time wasted and errors.
- There are small emergent examples of using data and analytics. For instance, Fire Services, Corporate Communications, Economic Development and Recreation teams have partnered to use Environics data to inform service delivery planning.
- There is a growing use of GIS across the City and specifically the adoption of GIS Collector app, driven from Engineering as a field data collection, verification and inspection tool.

## Key Issues:

- There are numerous opportunities to further leverage the GIS far more widely than it currently is, and a need to procure a new AVL solution to meet the requirements of the City.
- There is a limited ability for staff to search and discover unstructured content (files, documents), which is linked to the gap in ECM and the associated challenge of file shares with extensive and complex privilege management structures.
- There is no true corporate reporting, data warehouse or Business Intelligence platform to enable dashboarding and data analytics work.
- While there are numerous point-to-point integrations, there are no integration technologies in place to facilitate, standardize and simplify systems integrations.
- There has been limited work on data standards work to date.

# **Customer Facing**

## Positives:

- The City has a modern, responsive designed website 'outsourced' to a vendor partner, allowing for internal resources to be re-purposed and re-assigned (e.g. two Webmaster positions within IT Branch which have been re-assigned to Business Solutions).
- The website offers a range of core online services:
  - Service requests (integrated into the City's CRM system) and Live Chat customer service provided by Service Oshawa – both of which were and are industry leading solutions.
  - Road Occupancy Permits.
  - Road closures and construction work (map-based service).

- Animal licences.
- Find your garbage collection day.
- E-list registration for council/committee information.
- The City has implemented a cloud-based public engagement platform (connectoshawa.ca using Bang the Table) which is used frequently to solicit resident feedback on city initiatives.
- The City has implemented the Honk app for providing mobile parking payment services.

#### Key Issues:

- A key upgrade to the CRM system is required.
- The next wave of digital services will be dependent upon back-end systems such as CityView – to enable permitting, licensing and planning services, and Maximo – for efficient service request handling, road-based permits, etc.
- There is extensive work ahead to convert paper and pdf forms into digital forms and new integrated digital services.

A detailed summary of the work ahead for each component noted as requiring future work or at risk can be found in Appendix A.

# **2.2.1 Major Inflight and Planned Initiatives**

While the MTMM assessment identifies a number of areas requiring attention, we must acknowledge that a number of major initiatives are already underway at the City. These initiatives include:

- **Maximo**: Implementation of a comprehensive citywide computerized maintenance management system for all corporate assets.
- **CityView**: Implementation of a comprehensive, modernized, citywide land, property, permitting, licensing and bylaw management system.

In addition, the following major initiatives are planned for 2020

- **Tax System replacement**: replacement of the aged, self-supported Manta Tax system, with a modern solution.
- Lagan System upgrade: a key upgrade to the City's CRM platform, which supports the effective operation of Service Oshawa and has the potential to be a significant case management tool or platform used more broadly across the City.

There are additional initiatives that are known but not yet planned

- **HR Systems**: Implementation of a replacement (or major enhancement) of the City's workforce management systems, including employee records, payroll, time, attendance and scheduling, and learning management.
- **ECM:** Implementation of a corporate Enterprise Content Management system
- Agenda Management: Implementation of an agenda management (meeting agendas and minutes) solution.
- **AVL:** Implementation of a new AVL solution.

As well as numerous other solutions identified later in this document.

We will comment that it is challenging that so many major initiatives are potentially underway at the same time. All of these projects are high-profile and high-risk initiatives.

Maximo and CityView systems implementations are two extremely large and impactful transformation initiatives that will have a significant institutional level impact on the City's workforce, while the replacement of the Tax system is the major revenue source for the City and Lagan the foundation of the City's effective customer service interactions with the public.

We are concerned that tackling all of these significant and corporate-scale initiatives at the same time leaves little room for error.

# 2.3 IT Service & Management Practices Assessment Results

This section looks at the feedback that we received from staff on the current state and the practices employed in managing the IT environment and IT services.

## 2.3.1 IT Survey Results Summary

An online survey designed to better understand staff's perspectives on IT services was active between July and August 2019. The survey went out to all staff and a total of 279 responses (231 completed) were received.

The following is a summary of key findings:

#### Demographics

- A good cross section of respondents was achieved staff (62%), supervisors (19%), Managers (13%), CAO/Director roles (6%).
- Front line staff within the organization rate themselves as the least confident in their ability to use technology and the CAO/Director level identifies as the most comfortable. This seems contrary to evidence derived from workshops, interviews and conversations held through the strategic planning process.

#### IT Tools

- When rating IT services, network access and stability were rated largely as satisfactory although several comments (42) to open ended questions suggested that there were issues with network access and speed, particularly in relation to both public and private wi-fi connectivity within areas of City Hall and other City facilities (e.g. the Arts Resource Centre). Other areas of concern were noted to be the dependability of some hardware (printers, mobile devices) and remote access.
- Overall, 40% of respondents use their personal devices for work related tasks, the majority of which were managers and supervisors.

#### **Business Systems**

- None of the core business systems met the satisfaction target set by Perry Group (80% satisfaction). Respondents were least satisfied with Intelligenz (a recent implementation that is still wrapping up some loose ends), OLI (being replaced with CityView), Manta (to be replaced), and Spiceworks (which the IT Branch would like to replace, but for which there are no funded plans to do so).
- GIS and eSolutions (website and intranet) were closest to meeting satisfactory levels.
- Several comments (15) received indicate that PeopleSoft was not user friendly, complicated to use and slow (or incapable based on the current configuration) to perform necessary tasks such as reporting. A similar number of comments received (13) seem to suggest performance and training issues with Intelligenz, however, this is a recent implementation and may require additional attention to ensure the system is working optimally and staff understand the associated processes and functionality.
- It is worthwhile to note that staff were also very dissatisfied with the online staff change checklist. This issue was validated through the many conversations we had throughout the organization. There is an opportunity to review how both IT and HR process resource changes in order to streamline how this information is collected, managed and administered (this was also noted in the Information and Records Management Assessment)

#### **GIS/Web Mapping**

- Overall, 57% of respondents who use GIS/mapping tools are satisfied with the CAO/Director level being the most satisfied and supervisors being the least satisfied.
- Some comments (< 10) in this area focused on the need for more training on existing GIS/web mapping capabilities and more rigor around the frequency with which data is updated and maintained.

#### **IT Services**

- Overall, 75.5% of respondents are satisfied with the reliability of the technology they use.
- Respondents also noted they were either satisfied or very satisfied with IT service delivery. The overall knowledge possessed by IT staff and the timeliness of responses were noted to be the highest scoring factors.
- Some comments received (< 10) noted that IT could improve in better coordinating issues management, hardware deployment and providing service outside of business hours.
- Overall, 64% of respondents agree that IT can anticipate their technology needs, however, some comments received (< 10) suggest that further engagement and discovery is required to fully understand the business needs to address at the Branch level.

#### Communication

- Respondents prefer to contact the IT Help Desk by phone followed up by email exchanges. Online, 'self-service' interactions with the Help Desk were used least frequently as this capability is not widely publicised or promoted.
- The CAO/Director and staff roles feel they know who to contact in IT to solve a technology problem where Managers and Supervisors are least confident. Qualitative data suggests that some staff will frequently by-pass formal channels and contact individuals in IT that have helped them in the past.
- Respondents are mostly satisfied with how well IT communicates major system issues, however they also felt that more information should be shared with respect to "communicating IT plans and activities".

#### **New Requirements**

• The top four technology needs noted by respondents are mobile technologies, HR system/scheduling, document management and collaboration tools.

#### Training

- Overall, 47% of Supervisors feel that they have not been adequately trained in the technology they use with much of the knowledge assembled to date through informally "learning as you go".
- The top five areas where respondents would like to receive more training were; Intelligenz (recently implemented), GIS, PeopleSoft Financials, Microsoft Excel and PeopleSoft MMS and HR.

#### How are we Doing?

- Overall, 69% of respondents (against a target of 80%) are satisfied with IT with CAO/Director roles being the most satisfied and Managers being the least satisfied.
- In general, the overall comments suggest that IT is doing well to resolve technology issues 'in the moment' but further work is needed in the areas of training provision, mobile technologies, funding and leadership and better understanding user requirements.

## 2.3.2 IT Management Practices Summary

Next, we worked with IT leadership to look at the current state of IT services and the IT management approach at the City. Using a combination of self-assessments and consulting team assessments the following areas were rated.

#### 2.3.3 IT Governance

IT governance is defined as "the processes and structures which inform, direct, manage, and monitor how the organization makes the best and most effective use of technology."

Just as with broader corporate governance, IT Governance is intended to ensure that the right people are making the right decisions, at the right time, with the right information.

The following table identifies the typical IT Governance activities put in place by municipal organizations to help effectively guide their technology and transformation programs and compares to the City's current state.

Typical Structures and Processes	City Current State
Executive IT Steering Committee	Partial. The City has established an Information Systems Steering Committee (ISSC) that is responsible for project intake, evaluation and project portfolio oversight. The group is not an Executive level group it is a Director/Manager level group. The ISSC reviews and makes recommendations forward to CLT on priorities, IT budgets and other key IT decisions. While a lot of work has been put into establishing processes, the group is widely regarded as ineffective.
Supporting Committees	Partial. There are a number of 'solutions teams' that have been put in place to guide planning and work around key systems. For instance, there is an External Website Team which appears to be leading on Web and Digital work but is not integrated to overall technology / digital governance. Their role, membership and responsibilities are clearly defined and formalized.
	There are other teams such as the Intranet Solutions Team, the Intelli Solutions Team and a GIS Solutions Team. There was an Open Data Team at one point, but this group is no longer meeting regularly. The presence of these groups is good, but their role and membership should be more formalized.
	There are also a number of key areas, including Information and Records, Data Management and the Enterprise Resource Planning (ERP), for instance, where Solutions Teams or Working Groups could be beneficial.

Typical Structures and Processes	City Current State	
Clear and consistent IT investment process, including project prioritization	Partial. In support of the ISSC process there is a formal intake process for projects that require technology investment. There is an agreed evaluation process for all technology projects submitted through the process. However, there is no formalized business case required, and project goals and outcomes are not clearly articulated.	
Project portfolio management	Partial. The newly established Manager, Projects and Portfolio is responsible for establishing and evolving the portfolio management practice within IT, including resource management activities – but the practice is in the early stages of being established. Project Steering Committees and Project Teams are established, Project Sponsors are identified.	
Consistent / repeatable project delivery process	Lacking. While there are experienced leaders that deliver successful projects, practices are not fully embedded and there are no dedicated IT project managers within the IT Branch as IT staff manage and deliver the projects. The City has recently assigned a dedicated PM role to oversee the Maximo and CityView projects. While guidelines, templates and best practices exist, there is not yet a formalized project gating or review process. Best practices are sporadically applied to IT infrastructure projects. Overall, there is a lack of strong project delivery engine within the City.	
Corporate IT policies	Partial. While municipalities tend to be somewhat lax in regard to IT policy setting, an IT policy framework for a municipality should address the following essential topic areas. We have marked with a checkmark the policies that the City currently has in place.	
	<ul> <li>IT Governance Policy ✓ (partial/outdated)</li> <li>Acceptable Use of Technology Policy ✓</li> <li>Information Security Policy</li> <li>Privacy Policy</li> <li>Change Management Policy</li> <li>Mobility Policy ✓</li> <li>Cloud Computing Policy</li> </ul>	

Typical Structures and Processes		City Current State	
Corporate IT policies (cont'd)		<ul> <li>Backups/Restores Policy</li> <li>Disaster Recovery Policy</li> <li>Incident Response Policy</li> </ul>	
		Numerous other policies should also be considered:	
		<ul> <li>BYOD policy ✓</li> <li>Protection from Malware Policy</li> <li>Physical Security Policy</li> <li>Access Control Policy</li> <li>Disposition of Technology Policy</li> <li>Remote Access</li> <li>IT Procurement Policy</li> <li>Encryption Policy (Databases, mobile devices, etc.)</li> <li>Third-Party Remote Access Policy (vendors and support organizations)</li> <li>Data Management and Data Sharing Policy</li> </ul>	
Corporate IT standards, including architecture		Lacking. No formalized architecture designs or architecture principles have been defined to guide decision making.	
There are some documented pro procedures in place (e.g. for Hel Management) and some practice documentation (e.g. for PeopleS		There are some documented processes and procedures in place (e.g. for Help Desk, Change Management) and some practices and standards documentation (e.g. for PeopleSoft)	

Overall, despite the investment of time and effort into the operation of ISSC and its supporting processes, the City's technology governance model is not working as effectively as we would like – we would suggest that it is operating at the wrong level in the organization to make the strategic decisions required.

While CLT does review and approve the priorities recommended by ISSC, it would be preferable for CLT or Executive leadership to be more actively involved in priority setting – and making the tough decisions about which initiatives may be deferred.

For various reasons (including competing demands, executive direction, changing political priorities, unplanned work) the work that the IT Branch focuses upon is sometimes not in complete alignment with the priorities set by ISSC. Reducing the amount of unplanned and un-sanctioned work that the IT Branch works on will make more time available to focus on chosen priorities.

The fact that the City is attempting to execute many major transformation initiatives at the same time suggests that portfolio and resource management efforts are not working as effectively as we would like.

#### 2.3.4 ITSM Summary

ITSM refers to the practice of IT Service Management – that is the collection of best practices that an organization should typically have in place to efficiently and effectively operate the IT service. The summary below provides a specific drill down on the key ITIL best practices that we would expect to see in operation in an organization the size of Oshawa.

ITSM Processes	City State
IT Service Desk	Partial. The IT Operations team provides technical support to the organization. There is a high degree of admiration and respect for IT Service Desk throughout the City and the service is widely well regarded (as seen in survey results). Staff in this area respond quickly, work well with their colleagues to resolve ad hoc issues and provide good quality customer service. However, a more structured and tiered approach to IT Service Desk management would be beneficial in reducing the project interruptions and unplanned work that the IT Operations team currently experiences.
Incident Tracking and Incident Management	Partial. Incident logging is handled in Spiceworks but there is no conformance to SLAs, very limited and manual reporting, and no integration with knowledge management. This is an area that can be developed to help realize greater efficiencies and support continuous improvement.
Change Control Management	Partial. IT currently tracks changes made to systems with work being supported by the current IT ticket management system (Spiceworks) and informal communication between team members. There is evidence of strong communication outward to the organization in support of planned changes to systems, however, there is no formal change advisory board to support better communication within the IT Branch. The connection between systems and operations groups within IT is a vital requirement to ensure that changes to systems and infrastructure minimize downtime and limit unplanned disruptions to business operations. More

ITSM Processes	City State
Change Control Management (cont'd)	should also be done to standardize change management processes, formalize the discussions within IT and develop policies and procedures that focus efforts on proactive planning and analysis of change work.
Knowledgebase	Partial. Spiceworks and other document stores are used to keep documentation, but a formal knowledgebase is not in place and not available to users.
Problem Management (repeated issues)	Lacking. No formal problem management process in place, partially because the current system (Spiceworks) does not support this process. The benefit of problem management for the City, would be to reduce the likelihood and impact of incidents by identifying actual and potential causes, and managing workarounds and known errors.
IT Asset and Configuration Management Database (CMDB)	Partial. Asset inventory is not comprehensive (e.g. core infrastructure is not included) and can be out- of-date. The City also needs to track incidents and problems related to an item and track its relationship with other similar items for planning changes – this requires a CMDB that contains configuration items. E.g. application server. All Cis should be controlled by a formal Change Management process.
IT Service and Product Catalog	Partial. A high-level service catalog is available on the City's Intranet.

The assessment indicates an overall lack of discipline in the application of processes and procedures prescribed by ITIL and other ITSM best practice frameworks within the IT Branch. These frameworks provide guidance on how to operate effectively and while 'implementing ITIL' is not the goal, a certain level of discipline and due diligence is required to ensure that the team doesn't 'trip itself up' in the course of daily activities.

Attempts have been made to implement a number of these practices but sustaining them has been challenging. The justification from the team is that an overall level of busyness within the Branch precludes the application of best practices; which we fully understand.

However, investing in these processes and practices would lead to a more coordinated and effective use of resources ultimately saving the time to 'fix things' after issues occur.

# **2.3.5 Other Areas**

The following notes summarize observations in the attendant areas.

Topic Area	Comments
Financial Management	Budget review regularly occurs in relation to project management and at the branch level (supported by formal processes managed by Finance) with concerns escalated through to CLT. Currently there is no clear approach to cost recovery for IT services or standards on where source budget is drawn to support IT projects. Most fall under IT Capital Projects, however, there are examples of project funding driven exclusively through branch budgets outside of IT. There are no existing methods with which to track realized value or ROI from technology projects and services.
IT Procurement	While procurement processes are defined and procurement support is good, contract, risk and supplier relationship management are areas that could be more formalized and enhanced. Repeated references made to extended delays in receiving technology products suggests that enhancements to tracking and/or communication between IT and the business with respect to purchasing should be improved. Extending reviews to the performance of contracted services and outside delivery partners would help provide additional context aside from cost tracking.
Project and Program Management	IT has invested resources in formalizing project and program management capabilities. A standard project management framework is used, refinements to the intake process are underway. Project raking and prioritization is largely driven through ISSC although this process is challenged by a limited internal number of resources to deliver on an ever-growing list of technology projects. Further focus should be placed on resource management which can help identify and track deployments and better support interdependencies between projects. Improvements are also underway with respect to enhancing project performance reporting. This area is a key to improve the communications and overall relationships between the business and IT.
Architecture and Roadmaps	Currently, there are no frameworks or documented approaches to help manage the City's business system, network or data infrastructure. Although the City is currently replacing several key systems, IT capacity is focused on supporting the implementation projects, leaving few (if any) resources to help plan and strategize for future iterations of this work. Technology architecture in cities is complex, often woven together by a myriad of interfaces and integrations. As a result, it is critical that efforts are made to map these

Topic Area	Comments
Architecture and Roadmaps (cont'd)	connection points as well as the overall technology environment. Codifying the city's most important data, developing a roadmap for future lifecycle replacements (both hardware and software) and creating guidelines and standards for which they should operate are vital to the overall sustainability of infrastructure and the most optimal deployment of resources in support of this goal.
	There is a lack of clarity with regard to 'ownership' of business systems and accountability for changes – particularly around PeopleSoft. A more collaborative and collegial approach to planning, managing and executing initiatives in this space would be beneficial. Working Groups or Solutions Teams in some additional areas (e.g. ERP) could be helpful in this regard.
Business Systems Management	The recent system replacement projects (Intelligenz, Maximo, CityView) have reinforced conventional practices used by IT to gather business requirements and form multidisciplinary teams with the business in support of solution implementation. These projects should be leveraged to help document these practices to support similar programs of work in the future. The City's procurement process helps guide the acquisition of technology, however, more can be done to refine and tailor the procurement process to more directly support technology acquisition. Further, ISSC provides a forum whereby decision making on projects can occur (in concert with the project teams), but a more formal mandate should be considered to help elevate some of these decisions up to the executive level when needed. A lack of resourcing within IT and lack of discussion at CLT has led to adoption of technology without the necessary feasibility studies / business cases or a detailed and complete understanding of the full operating impacts. This fact, when coupled with the lack of dedicated Business Analysts (BA's), Project Managers (PM's) and/or Relationship Managers to projects furthers the comprehension divide between IT and its business partners.
Data Management	Our review along with that conducted through the Information and Records Management Strategy (I&RM) development process has determined that data management is not a current focus of the organization. There are backup and recovery activities occurring however, more needs to be done to formally tailor and document this process in support of varying business objectives. Auditing and retention functionality available within business systems is largely unused. Quality controls are ad hoc and undefined and few

Topic Area	Comments
Data Management (cont'd)	staff within the City acknowledge custodianship over their own business data. The I&RM will provide for more detail with respect to creating a more data-savvy organization that works to both leverage and protect 'data as an asset'.
Business Continuity Management	There are no Business Continuity (BC) or Disaster Recovery (DC) processes currently in place. This is a significant risk for the organization as outages and disruptions can limited and even negate all staff's ability to do their jobs effectively. BC and DC planning is a staged process that could be out tasked. That said, it would still require a sizeable commitment of time from internal resources to help document solutions, architecture and integration maps then define how and when interventions would need to occur in support of them. This is a high-risk area that is deserving of immediate attention.
Training	The City has a relatively strong network of 'super users' within Branches that provide system training to their peers. They also serve as an ideal resource to support requirements gathering with respect to implementation projects as well as the testing phase associated thereto. Aside from this, there is no formal program or funding to support technology training for staff. Often cited as an area of deficiency, staff require more training – both on enterprise systems, IT processes and digital tools available to them (e.g. Skype). Technology training would promote a more digital-savvy workforce and help realize the latent potential of investments made into enterprise systems and digital tools. This is not an IT-only decision to be made. Systems and tools are used in support of business processes, therefore, a corporate review should occur to determine the right level of training based on the specific needs of every branch.
IT Security	A technology security plan is currently under development and there is evidence of strong efforts put forward to manage identities and user accounts across the organization. Access controls for systems are in place and network security measures exist (firewalls, network segmentation, redundancy etc.). More work needs to be focused on documenting these processes and establishing formal standards and policies for both IT and the business to adhere to. Access and system privileges are unique to each system and provided for either by IT or the business. As a result, more formalization is required around roles and responsibilities. IT security is a corporate issue. The risk of data loss and other security vulnerabilities can occur from anywhere within the organization. Although IT provides for security measures and promotes best practices (e.g. rules on use of USB drives) risk

Topic Area	Comments
IT Security (cont'd)	still exists simply by way of staff perform their daily tasks. Cybersecurity is an area deserving of regular and frequent conversations throughout the organization so all staff are made aware of many pitfalls that can occur within a digital workplace.

#### 2.3.6 Technology Resourcing

The current organization chart for the IT Branch is shown below.



Figure 4: Current IT Organization Structure

The current headcount of the IT Branch is 23 FTE, with two temporary FTE secondments to support the Maximo project. The headcount of the IT Branch in 2010 was 22 FTE.

Since 2010, 2 FTE's have been re-purposed from Webmaster to Systems Analyst roles. However, during a period in which the City has seen some significant change and growth in its use and dependence upon technology, and while other communities have been investing in technology – the City's overall IT Branch complement has changed little.

As a result of the low levels of resourcing within the IT Branch, many of the team are doing double and triple duty, covering too many areas of responsibility to be effective, moving between areas without being able to apply sufficient focus and attention to tasks and activities. One comment from the IT Strengths, Challenges, Opportunities and Risks (SCOR) session struck us; the team feels that because of the level of the demand from business units and limited capacity within the Branch to meet demand, that many IT projects reach 90% completion and then staff are forced to move on, with plans to come back later (which often doesn't happen) – unfortunately leaving loose ends (lack of documentation) and projects unfinished (limited or ineffective handover to Branches).

Beyond the resourcing levels, discussed above and as part of the benchmarking section in this report, the key issues that we note in relation to the IT organization structure are as follows:

- The recently created Manager, IT Projects and Portfolio has no direct reports and thus no resources to assign to actively explore, evaluate or manage projects; this role continues with operational responsibility for some applications and is actively project managing a number of projects
- 2) The current Manager, Applications Support has a large span of control, particularly considering the active role this person takes in leading many of the Business Solutions projects.
- 3) A number of roles within the Applications Support team have been recently retitled Senior Business Analyst. While we understand the intent of renaming this role is to ask the incumbents of these positions to work more with business units as Business Analysts and to assist in relationship management, in practice these roles are being asked to: a) cover too much ground (act as solutions analysts, business analysts, project managers, relationship managers), and b) to influence strategic direction from too low of a position in the organizational hierarchy. Solutions Analysts may be a more suitable title for these as well as the Systems Analysts roles in the Application Support team. In short, the City requires dedicated Business Analyst roles within the IT Branch to help improve relationships with other business areas.
- 4) The Systems and Security Operations team lacks formalized structure around the Service Desk function, resulting in an informal distribution / allocation of reactive work – which in our view, provides a continual influx of unplanned work that disrupts committed resources to effectively undertake project work.
- 5) Key staff in senior roles in the IT Branch are eligible to, and plan to retire in the very near term, some in the medium term. Succession plans are largely non-existent and insufficient.
- 6) The following roles which we would expect to find within comparative organizations are missing from the Oshawa IT Branch:
  - a. Business Relationship Management
  - b. Service Desk Manager or Team Lead
  - c. Program Management
  - d. Project Manager
  - e. Business Analyst
  - f. Architect (Data / Solutions)

- g. Data Analyst
- h. Vendor / Contract Management

It is also worthwhile noting that GIS resources are currently distributed in a number of pockets across the organization (in Planning, Engineering, Parks and in IT Branches). A more coordinated, centralized resource base may provide the key to leveraging GIS more effectively and expanding the City's data focus.

Finally, we note that a lack of consistent culture, management styles and priorities within the IT Branch is undermining effective delivery of IT services. It is clear that IT staff are looking for stronger leadership in alignment with clearly articulated Branch priorities. When asked for input, IT staff noted that they are looking for *"structure, leadership and accountability within IT"*.

# 2.3.7 IT Service Gaps

Based on our assessment and feedback from business units there are a number of key gaps that should be addressed moving forward:

- Formalized IT support outside of normal business hours is a requirement of many business units (Rec, Fire, etc.). The IT team currently provides this service based on the personal goodwill of management and staff, rather than a formalized model of support.
- Improved IT training is a strong requirement across the organization for both core IT capabilities (Office and other productivity solutions) and for business solutions
- While some staff within IT have the job title Business Analyst in actuality they have very little time available to apply to that work, because they are also responsible for supporting business solutions
- Business Relationship Management is a gap
- There are no dedicated Project Management resources within IT
- The City has not allocated Data and Analytics Leadership responsibility and/or resources to Data and Analytics
- There is a need for specialized support for specific high needs areas, including Fire Services, the IT Branch doesn't currently have sufficient resources to address these requirements. Many other Ontario municipalities (e.g. Burlington, Guelph) fund or co-fund dedicated resource allocations, such as these, through departmental fund transfers. Dedicated staff are hired by IT to be part of the IT team and are physically located with those service areas that they support.

## 2.3.8 Benchmarking

As a general rule we use benchmarking cautiously. Municipal service offerings, delivery models and funding vary significantly between organizations – all of which have an undeniable effect on resource needs and allocation to technology.

Furthermore, in our experience, comparison to other municipal organizations with technology issues of their own, does not necessarily point the way forward. In certain situations, we fear that benchmarking can reinforce the acceptance of a less than satisfactory situation.

By and large we have found that Ontario municipalities underspend and understaff technology compared to municipalities outside of Ontario. Based on our work with municipalities in the Prairies and Western Canada, investment and staffing is typically significantly lower in Ontario than other provinces.

# Financial

## **Capital Budget**

The City has an annual fund assigned for Annual Technology Projects (growth and new technology) which is allocated at the discretion of ISSC (based on ranking) and subject to the approval of CLT. The budget is set at \$500,000 for 2019, 2020 and going forward.

The annual and 10-year IT capital budget also contains additional lifecycle funding for planned replacement or implementation of technology infrastructure and business solutions.

In 2019, the IT capital budget was set at \$1,445,000, of a total Capital budget of \$62,448,000 – representing 2.3% of the total capital budget. Note that some business-technology project funding comes from outside of the IT budget and is not reflected here.

The 10-year capital budget identifies funds for software (Lagan, PeopleSoft, Fire Dispatch) and hardware upgrades as well as for the implementation of Document Management and Meetings/ Agenda Management systems, although we suspect that funding will be insufficient for the ECM.

Note also that additional funds for significant capital projects, such as WMS (Maximo) or LMS (CityView) are funded separately through other capital funds – so the City's Capital spend on technology is higher overall – as a result of the major implementation work that it is undertaking.

#### **Operating Budget**

In 2019 the City's IT Branch operating budget was \$5,513,667 of a total \$153,098,586 City operating budget. IT represents 3.6% of the City's operating budget. However, this operating budget includes all maintenance for all software used across the City. In addition, approximately \$100,000 is for telephony charges (long distance calls) and \$114,000 for photocopying services – removing these costs see's the IT Branch operating costs at 3.45% of the total budget.

#### Benchmarking

Comparative metrics for IT expenditures are available, but these are largely based on and structured for private sector spending, nonetheless public sector organizations do participate in these benchmarking groups.

Gartner's State and Local Government IT spending average for 2018 is 4.3% of total budgets<sup>3</sup>. Combining the City's capital and operating expenditures the City spends 2.9% of its total budget on the IT Branch (again noting that separate capital investment for WMS (Maximo) and LMS (CityView) are underway).

Other industries invest significantly more in technology than the public sector. The financial and banking industry, with which government online services may be compared, invests upwards of 8-10% of their operating expenditures in technology<sup>4</sup>.

In our experience municipalities typically allocate between 1 - 4% of operating expenditures to technology, a level that we suggest should be more within the 2.5 - 5% range.

Capital spending is of course necessarily influenced by each organization's lifecycle stage and so arbitrary targets are perhaps a less relevant yardstick than the expected return on technology investment; depending on the state that an organization is in we have seen municipalities spending as much as 10% of their capital budget on significant technology transformations.

Proportional spending is a relatively crude assessment that only indicates whether an organization is in the right ballpark. Ultimately, investment and expenditures should deliver value as measured by business value creation, improved operational effectiveness, organizational productivity and reduced unit costs of IT.

#### Staffing

Metrics for IT staffing in the municipal sector are extremely variable. Our research with municipalities in Ontario suggests that municipalities typically deploy between 0 - 5% of their staff to IT. Although not always the case, municipalities with better performing IT functions tend to have a higher proportion of IT staff.

Gartner's benchmarks for 2018 suggests that an average of 4.0% of total staff are dedicated to IT in state and local governments across North America<sup>5</sup>.

<sup>&</sup>lt;sup>3</sup> Gartner Research – https://www.gartner.com/en/documents/3895271/it-key-metrics-data-2019executive-summary

<sup>&</sup>lt;sup>4</sup> Gartner Research – https://www.gartner.com/en/documents/3895271/it-key-metrics-data-2019

<sup>&</sup>lt;sup>5</sup> Gartner Research – https://www.gartner.com/en/documents/3895271/it-key-metrics-data-2019-executive-summary

Comparing raw numbers of IT staff (and ratios of IT staff to populations) with other organizations based on our recent research indicates that Oshawa is below most of its comparators and peers in regard to its resourcing of the IT function.

Municipality	Population (2017)	Туре	IT Headcount (FTE)	IT staff per 100k
Oshawa	170,071	Lower Tier	23	13.5
Whitby	135,566	Lower Tier	21	15.5
Richmond Hill	208,370	Lower Tier	34	16.3
Burlington	205,960	Lower Tier	36	17.5
Waterloo	113,520	Lower Tier	20	17.6
Greater Sudbury	164,926	Single Tier	34	20.6
Cambridge	129,920	Lower Tier	31	23.9
Kitchener	242,368	Lower Tier	61.6	25.4
Oakville	211,382	Lower Tier	57.1	27.0
Newmarket	84,224	Lower Tier	23	27.3
Barrie	153,356	Single Tier	42	27.4
Guelph	135,474	Single Tier	39	28.8

We recommend that municipalities allocate between 2.5 - 5% of their employee base to IT staff – with the expectation that the IT operating group will also be augmented by external resources, third party providers, contractors and consultants to support the delivery of major initiatives.

Oshawa staffing levels are toward the low end of the Perry Group guidelines at approximately 3.1% (based on current staffing levels of approximately 742 permanent employees and 23 IT staff).

It is also worthwhile noting that total staffing numbers reflect only full and full-time permanent staff and do not include the large number of part time (672), temporary, contract and seasonal staff for whom IT also provides support.

The IT Branch also provides services to a number of arms-length and partner organizations, including the following groups of which not all staff supported (OSCC staff are \*) will be included in the City's staff numbers:

- The Oshawa Executive Airport
- The Robert McLaughlin Gallery
- Oshawa Senior Citizens Centres \*
- Tribute Community Centre
- Oshawa Public Libraries

While we recognize that there are broad and consistent resource needs across the whole City there is undeniable scope, justification and demand for additional IT resources.

Increasing internal IT staffing to 3.5% would increase the IT complement to 26 FTE, to 4% would mean 30 FTE and to 4.3% to achieve the Gartner average would see the addition of 9 FTE's for an IT Branch with 32 FTE.

# 2.4 Over commitment: Balancing Supply and Demand Factors

# 2.4.1 IT Capacity

One of the key messages that the consulting team consistently heard from every level of the organization was that there is simply more demand for technology and technology driven business initiatives than there is supply. That IT can't keep up with the demand.

We heard numerous complaints that it was not possible to get to many of the initiatives suggested by Branches on the ISSC list; and that many of the potential initiatives have been on the list for multiple years (small projects in particular are prone to this treatment). Upon review of this list we can confirm that there are a significant number of pending projects carried forward year over year, but also that the projects that the City is tackling are large, multi-year endeavours.

Over a two-week period in late September, early October 2019 the IT team recorded their time allocated to five broad categories. This short snapshot was intended to provide some insight into where IT time is allocated – ongoing time tracking will be a valuable tool for the City to monitor efforts to shift work allocation in future.

While we acknowledge that a snapshot of such a small window of time can provide misleading information, and also note that this time tracking was under-taken at a critical point in the new device rollout program, we feel that it does provide some useful insight. We would also encourage the IT Branch to continue tracking time going forward.

The following table provides the results of the time tracking for the whole IT team.

Activities	% of time
Supporting Existing Technology - Incidents, Troubleshooting, Service Requests - Regular Maintenance (patches, backup, minor software updates, etc.)	33.4
Assigned Projects - Projects on the ISSC Project List	26.8
Administration - Internal Meetings (IT Management, team meetings, 1 on 1's, etc.) - Administration (Timesheets, vacation requests, expenses, PO's) - Staff Supervision	17.9
Ad-Hoc Projects / Change Requests - Not on the ISSC Project List	14.4
Out of Office - Leave, Sick, Lieu, etc.	7.6

The snapshot suggests that just over 3/4's of the Branch staff time is allocated to operational activities, leaving a quarter of the time of IT staff is available to be allocated to projects on the ISSC list. Note that this time includes the 1 current staff member from Engineering seconded full-time to the Maximo project.

Using the 23 FTE's in the IT Branch and the one current seconded project resource as the baseline, this equates to 6 FTE's or 1500 days in IT to dedicate to ISSC priority projects. This may sound like a lot of days; however, with 2 people allocated full time to the Maximo project it is easy to see how little capacity there is for significant projects. Two more projects of that size and all of the IT capacity is consumed.

This data bolsters the contention that there is insufficient capacity to do many of the projects that the City would like to do and is attempting to do, let alone do them well.

Of course, the other side of this situation is that lean business units also don't have the necessary time or resources available to allocate to projects.

This is a common case in most municipalities with which we work – but more extreme and starker in the City's case.

As in any economic model, there are two options available to balance the equation:

- 1. <u>**Reduce Demand**</u>: The City can reduce demand by creating disincentives or barriers to slow or reduce demand for technology.
- Increase Supply: The City can create more capacity on the supply side by adding resources (internally or externally), using 3<sup>rd</sup> parties, partnering to increase the capacity to deliver.

In our view it appears that the City has focused, either intentionally or not, on reducing the demand side of the equation by having the IT Branch control IT spend and IT resource allocation:

- By adopting a largely centralized IT resource model
- By constraining IT staff growth since 2010
- By adopting a centralized allocation of IT resources to projects through ISSC (although it appears that ISSC is largely ineffectual at constraining the demand side factors)
- By centrally controlling device purchases through IT
- By adopting a centralized IT budget to fund technology projects, and software licensing

On the supply side the City has done little to increase capacity; but more recently the City is:

- Beginning to use other funding sources to fund projects (e.g. Building Reserve)
- Beginning to plan for funding of some resources on projects (although full funding for backfilling project resources in the business unit or in IT is not a standard practice)
- Transferred the website to Corporate Communications therefore IT repurposed two webmaster positions to Systems Analysts
- Seconding one staff from Engineering to work solely on the Maximo project
- Seconding one staff from Facilities Management Services to Project Manage Maximo and CityView large enterprise systems

We note that successive IT reviews and strategies in 2010 (Prior & Prior), 2014 (Diverse Systems Group), and 2017 (KPMG – IT Function Audit and KPMG Cybersecurity Audit) have identified challenges with technology and some have recommended resource additions. The City has made little if any changes as a result.

If the goal is to achieve more, to deliver more, to increase throughput, then going forward the City must do a better job of coordinating and controlling demand but must also address supply side factors (by adding more capacity) if it is going to meet expectations of management and staff, of council and the community.

# **2.5 Organizational Tech Savviness**

An organization's ability to effectively leverage technology is not only a reflection of their technology team's capabilities. In fact, this is not the primary characteristic of those organizations that are most successful.

The primary characteristic of digital success is the awareness, the curiosity, and the willingness of an organization's leadership to drive forward business strategies that leverage technology, alongside their willingness to invest their attention, their effort and their resources.

Becoming more tech savvy and more tech capable as an organization is about embracing the opportunity to transform business processes, not about IT being applied to unwilling business partners.

In our opinion, CLT and the leaders across the organization need help to become more tech savvy – so that they can provide more active leadership to Council, the organization and the workforce. At this point, Branches and CLT have looked to the IT Branch for help, but as discussed earlier the IT Branch is not positioned to provide this support.

Investing time into Digital Education is one recommended approach that we believe could help CLT members and leaders across the organization understand the potential and learn about what makes for success in the Digital realm; positioning them better to lead the City's digital transformation.

Other organizations, such as Brampton and Barrie have positioned CIO's as part of the Executive Teams, to help bring that expertise and savvy to the table, ensuring that the technology and organizational implications of technology are well represented and discussed at the most senior level in the organization.

# 2.6 Organizational Approaches to Business Transformation Projects

## **2.6.1 Project Lead Times**

Large projects take a long time to come to fruition at the City. OLI replacement and WMS implementation projects were identified as important needs in the 2010 IT Strategy. That strategy also identified the importance of ECM. In 2019 OLI replacements (LMS) and WMS projects are now finally underway, ECM is not yet – because the Information and Records Management Strategy and plan, practices and resources to roll it out are not in place.

The lead time for key projects such as these at the City is so long as to be measured in decades. The opportunity cost incurred (improvements that are deferred) while such major technology projects are lined up are significant and compound year over year.

Communication relating to the ISSC project list is not conveyed effectively as many Branch staff have indicated they aren't sure whether their projects were moving forward or, in some cases, being actively worked on. The default method for the organization to make final determinations as to what technology projects received a green light seems to be once per year during the budget planning process.

#### **2.6.2 Project Outcomes: Balancing Quality and Quantity**

While there is some frustration as to the amount of project work that is completed annually, the other question is of the quality of delivery. The City is delivering many

business-technology projects – but is the City achieving the outcomes targeted, when projects are hurriedly implemented in an under-resourced manner?

Unfortunately, there are no formally defined business cases that clearly articulate the project goals and business outcomes for many of the technology initiatives, thus measures of desired outcomes are not available.

## **2.6.3 Big Bang vs. Agile**

The City has a tendency toward bundling major pieces of work together – creating very large corporate wide implementation projects – that take huge corporate energy and that assume a significant amount of risk.

The IT industry has recognized that big-bang, large scale projects are not typically successful (see the Federal governments Phoenix project and other IT industry debacles) and has moved to adopt agile approaches that break projects into smaller initiatives and deliverables, that get working software into the hands of staff rather than working on massive specification documents. That focus on iteration and gradual evolution of products and solutions.

The City should be learning from these approaches, breaking projects into smaller components where possible, moving to a product not project mindset. The Maximo project has recently adopted a more agile approach to development work – but this is an extremely large and important project to be experimenting with a new methodology.

#### 2.6.4 Project Resourcing

In our opinion, the City, compared to peers, is under-resourcing business-transformation projects. Projects are proven to be far more successful when staff can be dedicated to the project – not working off the side of their desk.

The City is doing itself a disservice, by under-estimating project and resource costs, which make it incredibly difficult to successfully deliver projects that realize the planned goals and objectives. A common mistake appears to be often repeated at the City in setting a budget and then trying to fit the project within the budget – rather than fully understanding and scoping a project need before seeking the complete funding required. It also appears that project contingencies are not included as a matter of course.

#### 2.6.5 Sponsorship vs. DRI

If you are sponsored to run a marathon, your sponsor doesn't run the marathon with you. A more active role than sponsor is needed to lead change.

When working on projects across multi-disciplinary teams, it is important to assign accountability.
Apple uses the term "**Directly Responsible Individual**" (DRI) to refer to the one person with whom the buck stops on any given project, task or activity.

Every project is assigned a DRI who is ultimately accountable for the success (or failure) of that project. Success is not the completion of the project or implementation of the solution, it is the achievement of the desired business outcomes (as stated at the outset of the project) - improved customer experience, new capabilities, or in increased efficiency.

The Directly Responsible Individual is responsible for providing the vision and leadership for the project. The DRI has a very active/proactive role to play - not as a figurehead, but as someone that is guiding and evangelizing the realization of the business capabilities as well as eliminating the barriers that impede their achievement.

DRI's can cascade. A DRI may assign tasks or activities, making others the DRI for those tasks and activities, but DRI accountability rolls up. A DRI may assign a task, but not the accountability - so the overall project DRI is always a single person.

### **2.6.6 Products vs. Projects**

A common approach to technology that we see at the City, and in many municipalities, is that the organization establishes a project team, purchases and partially implements a new solution. The project team breaks up, moves on to other projects and the product languishes, without plans for ongoing evolution and enhancement.

In these situations, the City has invested in a product, and digital products can and should evolve over time; but products need ongoing dedicated effort to grow and develop.

Think about how the iPhone as a product, that emerged without cut, copy and paste, has evolved over its lifespan. Innovation is often borne out of a continual grinding out of small enhancements and improvements over a period of time – innovation through iteration – and we have seen many municipalities make major progress through adopting this approach – Guelph, Burlington, Windsor and Kitchener for example have been evolving their Land, Permitting and Property Management systems over many years, through dedicated teams of people (2-3 people per system).

Today, save for PeopleSoft, the City allocates one person (Business or Systems Analyst) in IT per system. This allows the City to provide the base level service, keeping the service up and running – not evolving the product over time. Changing the City's focus to a more product centric mindset, which invests resources into core platforms and that evolves important City platforms (CMS, CRM, ECM, ERP, LMS, GIS and WMS) over time is a key strategy that would benefit the City - this must be backed up by resource allocation.

# 2.7 Expectations of IT

We observe that there appears to be a lack of clarity in regard to the roles and responsibilities of the IT Branch and those of the Branches, or a clear endorsement of those at CLT level. At the heart of this is a key question:

### 2.7.1 What Type of IT Function does the City Want and Need?

Based upon its research the IT Research firm Forrester has identified three types of Information Technology organization<sup>6</sup>, as outlined in the diagram over the page in Figure 5.

This model illustrates a progression in sophistication and capability of IT organizations based on the defined mandate and role of the IT group.

- For some organizations, the Leadership Team funds, resources and mandates IT to a somewhat limited role; to be a **Solid Utility** – with the primary objective for the group to keep unit costs low and deliver reliable basic core IT services. Other teams in the organization take responsibility for projects and transformation activity.
- In other organizations, Leadership looks to the IT group to provide the solid utility service <u>and</u> for them to use their experience and expertise to lead corporate and departmental solutions projects. In this mode the IT Branch becomes a **Trusted Supplier** – trusted to execute on key corporate applications projects.
- 3. Finally, other organizations see the IT Branch as a transformation engine. They look to the IT Branch to work with business leaders and business units to identify and implement business transformation projects as a **Partner Player**. IT is a true partner working at the Executive table, actively contributing to major business transformation initiatives.

<sup>&</sup>lt;sup>6</sup> https://www.forrester.com/report/IT+Capability+Maps+Help+CIOs+Manage+IT+Like+A+Business/-/E-RES56872#



### 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.

#### Figure 5: 3 Types of IT Organization

So, where does Oshawa's IT Branch fall in this scale?

While we note that there are some current frustrations with Surface and Wi-Fi reliability, which are undermining the levels of satisfaction – and while these issues point to improvements that can be made to IT Service Management practices - we see these as a short-term blip.

The staff survey results (discussed earlier) indicate a broad satisfaction with core IT services. It is our assessment that the IT Branch generally fulfills the Solid Utility role reasonably well, with widespread satisfaction with the core commodity services of an IT department (e.g. helpdesk, PC provision, telephone, network reliability, email).

We believe that the IT Branch had in the past been seen as a Trusted Supplier, taking the lead on corporate and departmental application projects – but in recent times more responsibility for leading business solutions projects has been passing to the Branches – with varying levels of success.

When the IT Branch does run projects, it typically has run projects off the side of the desk, as the Branch has no dedicated Project Manager or full-time dedicated Business Analyst roles (current roles called Business Analysts are fulfilling more of the role of Systems or Solutions Analysts). The IT Branch has only recently begun to develop a Project Management Office capability. In our view, the IT team is not structured nor resourced to be an effective Trusted Supplier.

Moreover, more recently the responsibility for the delivery of two major corporate application projects – namely Maximo and CityView – is being Project Managed from

outside of IT (notwithstanding the fact that IT is a key stakeholder and contributor to these projects) – accountability for both these projects is not as clear as it should be.

So, interestingly the trajectory of responsibility is away from the Trusted Supplier mode for IT.

It is evident to the consulting team that the City currently lacks what we would term the corporate "project delivery engine" that we see practiced by other successful municipal organizations. Such a "delivery engine" is a broadly understood and repeatable methodology and practices that ensures that those organizations can be confident that investments made in business transformation supported by technology reliably achieve the expected outcomes and returns on investment.

Looking to the top of the pyramid, while the IT Branch is not currently fulfilling the Partner function today, based on our discussions with each of the business units, and members of CLT – there is a strong desire for IT to be more of a partner with business units, to provide more help and assistance to the organization as a whole to identify the strategically important opportunities to apply technology to City challenges and business problems.

The common phrase that we heard from teams that we met was "we don't know what we don't know". There is evidently a strong need and desire for more help from IT to illuminate the opportunities, to highlight the options and possibilities and to help execute on initiatives.

But, as we have noted above, the City appears to be turning in another direction, moving IT more toward the Solid Utility role – rather than expanding the mandate of the Branch.

There is an evident mismatch between the expectations of the Executive, the business units and the way that the IT Branch is currently mandated, resourced and funded.

Fundamental to the future, we believe that Council and CLT must determine what type of IT service and thus IT Branch it wants and needs. What is the role of IT in the organization to be and what should the role of the Branches/ Business Units be?

Once determined, the organization must commit to the chosen model, support and reinforce the model through decision making and by leading by example. Increased investment in resources to make the chosen model work effectively will undeniably be needed.

# 2.8 Current State Summary

In summary, the important issues that the MTMM assessment identifies are that:

• While the MTMM assessment indicates that the City's **Infrastructure layer** is largely in good shape, recent performance challenges with the introduction of

new devices and changes to City Wi-Fi should remind the City and the IT Branch of the importance of planning and testing, due diligence and discipline in the deployment of new technologies.

- Particular focus is needed from the IT Branch to improving its ITSM practices and procedures, continued investment in an effective Security program, alongside work to define Business Continuity and Disaster Recovery requirements and measures as well as IT Policy and Practices are critical due diligence activities that must be resourced and tackled.
- Embracing cloud technology is an important industry trajectory (a true paradigm shift that is not going away) and the City must rapidly educate itself and establish a formal open-ness and approach to the adoption of cloud services and solutions.
- The **Business Solutions layer** is where the City faces the most work over the short- to medium-term. Extremely large and significant, resource intensive and change management heavy initiatives such as LMS and WMS are underway and cannot afford to fail having waited so long to move forward. Work in the HCM area will be essential for the City to be able to effectively manage its largest and most costly assets people, and to reduce one of the most administratively intensive processes payroll and scheduling. Tax systems replacement and CRM upgrades are likely to significantly tax the organization beyond its capacity if tackled while LMS and WMS are underway.
- The **Data and Integration layer** represents a significant opportunity that has been largely untapped at this stage. Opportunities abound to measure and monitor, understand and optimize service delivery using data that the City already collects and will collect in future. Responsibility for this area is currently un-defined, and work to drive activity in this area, beyond the GIS, is also largely un-defined and under-resourced.
- The City has done some excellent work in the **Customer Facing layer** and in delivering some digital services, creating a strong foundation for future expansion of digital services. It is interesting to note that this is founded on the basis of working with a vendor partner that has considerable expertise in the domain, outtasking specific functions at a cost to the City but allowing the City to move faster and be more flexible; perhaps this is a model that can be replicated elsewhere.

The IT management practices review tells us that:

• There is greater demand than there is capacity for technology and businesstechnology projects at the City and existing IT governance processes are not able to effectively match or balance supply and demand; this is creating a vicious cycle of frustration at all levels, within the IT Branch, at CLT and within business units; this cycle must be broken.

- An estimated <sup>3</sup>/<sub>4</sub> of IT Branch time is allocated to operational work, leaving just <sup>1</sup>/<sub>4</sub> of the resources available for project work.
- We have identified important IT Branch service management process improvements that should be made to the way that IT operates. Implementation of these recommendations will require resources to achieve in the short-term but will lead to efficiencies within the IT Branch over the medium-term.
- Even with efficiencies achieved within the IT Branch, there still remains significant scope for the addition of IT resources based on the City's current experience, future needs and based upon comparison with industry and municipal-peer benchmarks.
- CLT and business leaders understanding, and ownership of technology-driven transformation projects needs to be improved.
- Effectiveness of project definition and delivery could be improved, and projects need to be championed, led and resourced better to ensure achievement of agreed outcomes. The practice of funding project staff and backfilling project resources for projects is only recently being experimented with, not a standard practice.
- Meanwhile, Branches are looking for more help from the IT Branch in identifying how technology can help them be more effective; but the IT Branch does not have the available resources (or skills) to address these needs and is asking various existing resources to fill this gap.
- Training and change management has been identified as a major gap that the City must address.
- Looking to the future there is a need for CLT to determine what type of IT function and service they want and need going forward. In this context, particular questions regarding whether the IT Branch should provide the following services to the City need to be considered and future directions agreed:
  - Solutions, Data and Technology Architecture
  - Business Analysis business process review and design assistance, requirements development, business case development
  - Project Management of Business Solutions projects
  - Leadership and coordination of GIS work
  - Leadership and coordination of Data standards, Business Intelligence and Data Analytics work
- The role of IT with regard to important programs being led elsewhere in the organization should also be defined.
  - Smart City initiatives
  - TeachingCity and Innovation projects
  - Audit and Lean reviews

This assessment should provide a common baseline, one that likely confirms the City's IT and Management understanding of the current situation. Now, what should the City do with this information?

# 3. Setting Strategic Directions by Resetting the IT Delivery Model

# **3.1 Determining the Type of IT Function the City Needs**

We believe the City's leadership must make an important decision about the type of IT function it wants and needs. What should the mandate for the IT Branch be going forward?

# **3.1.1 Options and Considerations**

The three archetypes for IT functions presented in the earlier section were:

- **Solid Utility**: The IT organization is expected to provide cost effective-dial tone reliability with transparent costs.
- **Trusted Supplier:** 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.
- **Partner Player:** 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.

These three archetypes suggest a logical progression in maturity, capability and investment.

An IT organization should attain and sustain Solid Utility status before it can progress to becoming a Trusted Supplier. An IT organization cannot be a Trusted Supplier if it cannot deliver the basics – in other words "keep the lights on". IT must be a Trusted Supplier before it can progress to becoming a Partner Player and so on.

While considering what type of IT service the City needs, it is also important to reflect upon the City's business model for delivering technology.

We understand that the current IT business model is based on a centralized, sharedservice model which, while effective at managing constraints (limited budgets and resources), is not meeting the wide range of varying expectations held by the organization.

Centralized models are typically the most effective models at minimizing costs – which may be the primary factor that drives the City. Based on our experience, sometimes strictly "cost effective" strategies employed to fund an IT model are antithetical to actual intent. A lack of growth and investment into an IT model can actually lead to real limitations on the actual capabilities designed to better understand and serve the organization better and more cost-effective manner.

In considering the gap between expectation and needs, alternative business models may be considered. The alternative options that we see being available to the City are:

- 1. Do nothing status quo continue as is, with a baseline funded and resource centralized model that keeps IT costs low and struggles to meet expectations
- 2. Continue with a centralized business model, adding more funding centrally to increase delivery capacity to better meet expectations
  - a. Increase the Annual Technology Fund
  - b. Add Capital funding to allow for more contract and consulting resources or utilize existing Annual Technology Fund to fund contract staffing
  - c. Add more internal staffing to the IT Branch to support identified needs
  - d. Add additional funding centrally to support high-need areas
- 3. Continue with a centralized business model, allowing Departments to add additional funds to top-up funding and resourcing as required to support Department specific needs
  - a. Assign dedicated resources to support high-need areas (funded or cofunded by departments)
  - b. To fund projects and additional purchases
- 4. Consider selective decentralization of some IT functions namely business solutions management and evolution allowing Departments to justify and fund additional resources in their department
- Consider extensive decentralization of IT functions with the IT Department focusing on the Solid Utility function – allowing Departments to justify and fund additional resources in their department

If Council and CLT wants to see a change in the role that the IT Branch plays and wants improvements to technology project outcomes, we suggest that the status quo is not an option.

Interestingly, in those organizations where IT teams consistently aren't able to meet the expectations of business units, over time, we see a trend toward selective or extensive decentralization of IT services. In these scenarios, overall IT costs typically increase significantly, coordination is made more complex and we see more waste; which we assume the City would prefer to avoid.

Given the financial environment at the City, we would suggest that an approach that combines aspects of option 2 and 3 is the appropriate model for the City to pursue.

# **3.1.2 Suggested Direction**

So, what type of IT function should the City target?

As noted, it is our opinion that the IT Branch is currently resourced more as a Solid Utility than as a Trusted Supplier. The absence of Project Management and true Business Analyst resources within the IT function is the key factor in this assessment. Given the important role of technology to drive efficiency, productivity and customer service, we believe that the City should strive for the IT Branch to operate as a Partner Player.

We would suggest that the first step to achieving this is to solidify the IT Branch's Solid Utility capability by implementing efficiency and productivity improvements around the IT Service Management practices and expanding staffing dedicated to the service desk function – releasing Infrastructure staff to more effectively manage the core IT infrastructure.

Next, we suggest that the City invest in the 'project delivery engine' – Business Analysts and Project Manager's, and other capitally funded contract resources to help scope, plan and execute projects more effectively – attaining the Trusted Supplier mode.

# **3.1.3 Key Questions re: Roles and Responsibilities**

In relation to questions regarding which services the IT Branch should provide it is recommended that the City re-sets the mandate for the IT Branch to include the provision of the following functions:

- Solutions, Data and Technology Architecture
- Business Relationship Management
- Business Analysis business process review and design assistance, requirements development and business case development
- Project Management of Business Solutions projects
- Leadership and coordination of GIS work
- Leadership and coordination of Data standards, Business Intelligence and Data Analytics work

These suggestions imply that:

- 1) The IT Branch will use consulting effort and allocate management resources and effort to the establishment and maintenance of architectures and supporting guiding principles and standards
- 2) The City will need to establish and allocate staff resources to the Business Analyst function within the IT Branch
- 3) The City should review its distribution of GIS resources, develop a GIS Strategy and as part of that work consider establishing a centralized GIS function with program leadership dedicated to generating value in partnership with Branches outside of IT
- 4) The City should allocate required resources (perhaps aligned with the GIS team) to lead, establish and resource a Data Program function within the IT Branch

Looking pragmatically, there is much work ahead. So, we would suggest that other areas currently outside the responsibility of the IT Branch continue to be led by other teams, but with active participation and partnership supported by formalized governance and performance-based processes.

### Web and Digital

The Corporate Website and community engagement websites should continue to be managed by the Corporate Communications function and aligned with the City's customer service strategies. However, it should be noted that Corporate Communications assumed responsibility of two external websites without additional staff and are also under-resourced as per the 2018-2021 Communications Strategy.

Digital initiatives such as IT Branch representatives should participate, support and partner with this group in the development and delivery of digital initiatives.

This work should align with the Architectures and Business Solutions work. It is suggested that the City expand the remit of the Website Steering Committee into a Web and Digital Steering Committee (which would operate as part of an overall technology governance framework) as a means of coordinating an annual Web and Digital work plan, which would in turn be coordinated and aligned with the overall technology work plan.

#### Innovation

Technology is a central component, of course, to innovation – but innovation can also be independent of technology. The IT Branch should support, participate and catalyse innovation work, but Council and CLT must determine where leadership for the Innovation program lies.

Furthermore, there are a wealth of opportunities to work with TeachingCity in and around technology and data programs to bring community innovation and the education community to bear to City challenges and opportunities. While the IT Branch should work with the TeachingCity program to develop a framework for ideating, testing, piloting and then operationalizing ideas, the leadership of the TeachingCity program is appropriately managed elsewhere.

#### **Smart City**

Again, the IT Branch has a key part to play in Smart City and should actively be involved in discussions and planning around Smart City – particularly with regard to architecture, standards and principles that will make Smart City initiatives inter-connect and integrate.

But leadership of a Smart City strategy and coordination of Smart City program should be coordinated elsewhere at this time, while the IT Branch addresses its progression to the Solid Utility and Trusted Supplier role. In the meantime, Council and CLT must determine the suitable program leadership model for this program.

# **3.2 Managing Supply and Building a High Performing IT** Function

The City needs to achieve a suitable model of technology delivery, with expanded Supply capabilities and with clearly understood roles and responsibilities. A high performing technology team is critical to the City's ability to be an effective organization.

### **3.2.1 Organizing Internal IT Resources**

A common functional approach to organizing IT teams across leading municipalities in Ontario, and the roles and responsibilities assigned to each team, is shown below.



Figure 6: Conceptual IT Branch Org Chart

### IT Leadership – CIO / IT Director

- IT strategy and planning
- IT governance
- IT performance measurement and reporting
- IT financial management (budgeting)
- IT Business Relationship Management
- IT Policy and standards

- Risk and compliance management
- Vendor and contract management (in partnership)
- Technology Training and Education program coordination

### Client Services Team

- Incident Management -1st level technical support (including knowledge base management)
- Identity Management User account management (AD and systems) (creation, deactivation, group membership)
- Request Fulfillment for standard services including: Productivity software support, Device (PC, laptop, tablet, phone) and peripheral (scanner, printer, etc), Software access provision and package deployment, A/V support, Mobility support
- Asset management, license management, inventory, procurement incl. fulfillment and onboarding
- Service catalogue management

# **Technology Services Team**

- Responsible for Technical Management (Infrastructure design, build/ acquire, test, operate and discontinue)
- Technology architecture (including standards and roadmap)
- Network (WAN, LAN, Wi-Fi) Telephony, mail, messaging, unified communications
- File and print infrastructure
- Computing platforms (including servers, workstation, tablets, etc.)
- Remote access and mobility technology
- Cloud infrastructure solutions
- Security defense (e.g. firewall, IPS, a/v, malware, spam),
- Data Centre
- Backup and restore management
- Disaster Recovery operation (IT Service Continuity Management)

# Business Solutions, GIS & Data Team<sup>7</sup>

- Responsible for Applications Management (Business Systems design, build/acquire, test, implement, operate and discontinue)
- Solutions architecture (including standards and roadmap)
- Systems planning
- Systems integration and middleware (incl. with business partners, customers, and agencies)
- Enterprise and expert applications
- Web and digital solutions
- Cloud business solutions
- GIS technology and data architecture

<sup>&</sup>lt;sup>7</sup> Note that some organizations are investing heavily in the GIS and Data function and operate that as a separate program or team within the technology function

- GIS technology design
- GIS systems planning and management
- Integration of GIS and non-GIS systems
- GIS data acquisition and exchange
- GIS operations including GIS core data management, mapping and analytics on-demand
- Enablement of divisional / departmental GIS analytics, mapping and reporting
- GIS education and training program
- BI framework, Data warehouse management, and Master Data Management,
- Enterprise Dashboards, Enablement of divisional / departmental analytics and reporting

# Strategy, Planning & Project Delivery Team

- IT strategy and planning
- Project portfolio management including intake of technology projects and governance support
- Project management for technology projects
- IT resource management and planning
- Monitoring and reporting across the IT project portfolio
- Responsible for IT Business Analysis function including: IT Business Cases, Business Requirements (including process/data models)
- Selection Criteria/Build Specifications, Test Plans to verify user requirements

Broadly speaking, this points to a need to strengthen the Management layer and fill out each of the teams within the IT Branch, allowing the IT Director and Managers to operate at a more strategic level.

# **3.2.2 Clarifying Branch Responsibilities**

With the IT function responsible for the activities identified above, Branch responsibilities would be in the following areas.

- Ongoing engagement and active partnership with IT through a Business Relationship Management program
- Partnering with IT in the planning for <u>all</u> technology solutions that store City data or are accessed across the City's network
- Active project accountability, leadership
- Commitment to adequately resourcing initiatives and ongoing systems with power users and Subject Matter Experts (SME)
- Simple business system configuration and end-user workflow configuration (not including user lifecycle events)
- Understanding and keeping up-to-date with business systems capabilities and how to leverage the capabilities
- Driving the utilization of business systems in business areas and aligning systems to business needs
- Business systems testing (upgrades, software changes)

- Business process ownership, design and re-design
- Leading adoption and change management programs in support of systems implementation
- Leading the delivery of training for business systems
- Data stewardship, data management and data editing activities
- Data analysis, analytics and reporting
- GIS data management
- GIS exploitation / utilization
- Participation in vendor relationship management in partnership with IT

Note: Coding & development work, technology procurement (software, hardware and services) and systems architecture work should not occur in departments, excluding any formally agreed exceptions.

### **3.2.3 CIO vs. IT Director**

Dependent upon Council and CLT's decision about the type of IT service it thinks the City should have in place, if the City is looking for a trusted supplier and partner player in the long term, then we believe the City would benefit from a CIO role (as is in place at Burlington and Barrie, Markham, Richmond Hill and Brampton).

What's the difference between a CIO and an IT Director? The following table outlines the typical differences in the functional responsibility between an IT Director which is typically focused more on operations and inward focused, compared to a CIO that is more outward focused.

IT Director/Manager	CIO	
Typically, a member of the middle	Typically, a member of the executive	
management team who executes and	team (or at least plugs directly into	
controls	corporate strategic decision making) to	
	influence and inspire	
Central focus is on maintenance and IT	Primarily focused on business	
Operations	opportunities and drivers	
Business area and IT (inward) focused	Focused on the enterprise and how	
	technology can be leveraged to meet	
	strategic objectives	
Process and procedure focused (how to	Strategy and execution focused (what to	
perform)	perform)	
Works with the intent to provide stability	Critical in times of change, focused on	
at all cost	positive disruption and collaboration as a	
	means to drive innovation across the	
	organization	
Generates tactical plans strictly focused	Engages the corporation to develop and	
at the project or program level – typically	execute strategic technology plans	
requires outside strategic assistance		

IT Director/Manager	CIO	
Aims to complete projects and	Aims to implement projects, but extends	
deliverables on time and within budget	vision to managing and improving related	
	outcomes	
Focused on the tech first	Customer-centric	
Responsive to demands, reactive in	An evangelist for technology and the	
nature	business who works to create new value,	
	proactive in nature	
Budget focus is on sustaining operations	Budget focus is split between innovation	
and utility	and operations (bimodal)	
Typically, avoids risk or seeks	Is open to manageable risk as well as	
opportunities within given technical	working with outside partners to deliver	
capacities	on value that cannot be fully supported in	
	house	
Develops regulations, process and policy	Relies more on engagement, training and	
to control behaviour	collaborative activities to sponsor and	
	support change management	

### **3.2.4 Investment in New IT Resources**

Given the results of the benchmarking and the recommended directions outlined above, we would recommend that the City increase supply by investing in internal technology resources.

We would suggest that the City plan to incrementally invest in expanding the IT service by up to 2 FTE per year for the next 4 years. Assuming some baseline growth in the overall headcount of the City, this would take the City to approximately 4% of its FTE base (using the current 742 as the base) being IT resources – within the recommended Perry Group range.

While work remains for the consulting team to work with the City to determine and recommend the optimum IT organization structure for the City, the first two priorities for internal FTE additions at this stage would be:

- A new Client Services Manager, reporting to the IT Director and responsible for Service Desk operations, reducing the pressure and interruptions to the Infrastructure team, freeing them to work directly on projects and due diligence around operations (note that a number of the Support Analysts would move from the Manager, Systems and Security Operations)
- A Project Manager / Business Analyst, reporting to the Manager, Projects and Portfolio

The intent of these immediate role additions is to a) stabilize the ability of the City to provide the Solid Utility service, and b) to improve the ability of the City to deliver a small number of projects more effectively.

Other activity to secure a year-round co-op placement to support the Client Services function could also be pursued and would also be intended to stabilize the Solid Utility service capability.

As part of the 2020 budget process the City must ensure that any new technology projects going forward must capitalize short term backfill and project resource needs as part of the project budget. For each project, the City should consider – does this project have the following roles assigned and truly available to dedicate the amount of IT time required to actively participate in the project at the level that is required:

- Project Manager
- Business Analyst
- Business Lead / Subject Matter Expert
- Technology Lead

Subsequent work on this strategy will recommend a long-term organization model for the IT Branch.

### **3.2.5 Resource Augmentation and Utilizing External Expertise**

The reality of modern IT, particularly with small municipal teams, is that maintaining the necessary skills and capacity to plan, implement and manage all the City's increasingly complex technical environment and burgeoning project demands in-house is impractical. To do so would mean hiring an unfeasible number of additional IT staff.

Smart IT organizations approach this challenge by relying on a team of in-house IT staff with strong internal connections and understanding of the organization's business needs, who in turn work with a network of trusted partners, vendors and solution providers to deliver the required services.

Similar to the way that the City approaches road building and road maintenance, relying on construction firms with road building expertise - the emphasis is on "getting projects done", or "project throughput" rather than on IT staff necessarily implementing the technology themselves.

This is a hybrid model of IT service delivery, that combines internal IT and business skills with market-based expertise and services. Ultimately, it means that the IT Branch, the IT Director and Manager's begin to work more as coordinators or orchestrators of IT service delivery – which will be executed by a combination of internal staff and external providers.

To effectively operate in this way, the IT Branch and its leadership and management needs to develop new skills around contract negotiation and vendor relationship management, contract management and dispute/conflict resolution.

The City's goal is to increase speed, agility and project throughput by using the right mix of resources and skills for the job at hand. Several approaches are common in municipalities for augmenting internal IT resources, including:

### **Capital Funding Contract Staff Positions**

Projects are proven to be successful when staff can be dedicated to the project – not working off the side of their desk.

To achieve this level of dedicated attention to projects municipalities commonly use contracting for short term staff (1 to 2-year contracts). Costs for staffing contracts are 'bundled' into the total capital cost of the project. Thus, when projects are approved the appropriate staffing to execute the project is also approved.

Contract staff may be used directly on the project but are more typically hired to backfill IT or subject matter experts in business units, freeing up internal staff to work on projects. This allows the City to retain the accrued project learning and expertise, and to offer development opportunities to internal staff.

### Vendor of Record (VOR) – IT Resources on-Demand

Because of the regular need to bring in additional IT and subject matter business resources to support project activity, numerous municipalities (e.g. Richmond Hill, Guelph, Mississauga) have embraced a roster or Vendor of Record (VOR) model. In this approach, the City would have an arrangement with one or more firms that can supply experienced Project Manager, Business Analysts, network or security specialists, GIS experts and other technical resources to the City, on-demand at pre-set rates.

Funding for a VOR resources are also included as part of a project capital request and this can enable the City to quickly ramp up resources to lead major projects.

#### Service Providers: Out-Task Some IT Services

While wholesale IT out-sourcing is extremely uncommon in the municipal sector due to the complexity of municipal business, the City should adopt selective out-tasking as a strategy to augment internal resources – reducing the need to add new IT staff.

Because of the increasingly commoditized nature of IT infrastructure, this is an area where out-tasking can have the highest value and impact. In fact, the City already does this in a number of places, one specific example is in the way that it manages the rollout of its devices – relying on a service provider to purchase, configure and deploy new devices to staff, and also collect and return the machines that have reached the end of the lease.

Although we acknowledge that there is some overhead to managing these types of contracted and managed services, there is great scope for additional use of this model, and we would encourage the City to investigate options.

One particular area that municipalities are increasingly leaning on managed services is in the area of managed IT security services. This is one area in which it is challenging for organizations with small IT teams to keep up with all of the threats that exist or to build the team with the skills and capacity necessary to effectively manage the program.

In this model the IT Branch will be the orchestrator of IT service provision, matching the needs of the organization to service delivery – either provided internally by IT staff or by 3<sup>rd</sup> party expertise. Who provides the service should be entirely transparent to City management and staff.

### Use External Expertise to Plan, Design and Set Strategies

Setting strategies before tackling projects is critically important to successful outcomes (measure twice, cut once). Fully exploring possibilities before diving in is essential. In this area, there is clear value in engaging experts in the right measure, at the right time.

Consultants with deep domain experience and with experience in developing strategy and implementing solutions can help to guide the City in developing plans that properly leverage systems' capabilities to address business challenges.

### Leverage Strategic Partnerships

Although the IT Branch is capable of designing and building great solutions, it doesn't always mean that it is always the right approach. Looking forward, strategic decisions are needed regarding whether the City is best suited to build and deliver a solution or whether another partner (in the public or private sector) may be better suited to address a need.

In fact, the City's partnership with Oshawa Power (OPUC) is one such example. By partnering with Oshawa Power, the City has saved significant costs and achieved much higher levels of service.

Some examples of municipal partnerships around technology include around Public Wi-Fi with different municipalities adopting a couple of different approaches to partnership.

Some have built their own Public Wi-Fi networks, committing their own resources and time to the work. In this area, Mississauga has partnered with Sheridan College, due to their expertise in providing Wi-Fi to over 20,000 students at campuses across the GTA. Sheridan provides and supports the Wireless Mississauga service. Burlington has partnered with the local telco – Cogeco – which now provides public Wi-Fi in City facilities and in parks and other civic spaces.

In both Mississauga and Burlington, partnerships with organizations with strong expertise have allowed citizens to receive a great service, from providers with deep expertise, whilst IT resources can focus on other areas that are core competencies for them.

Given the pressures on internal IT resources that have been identified, the City should think strategically around the opportunities for partnership as it considers technology opportunities. Working with its post-secondary educational partners, Oshawa Power and others are good ways to share costs and work effort.

Continuing to work, as the City already does, with the Region and other municipalities in the Region to piggy-back on purchases and explore opportunities for joint project implementations is another example where the City can gain value through strategic partnerships.

# **3.2.6 Personal and Organizational Development in the IT Branch**

In striving to build a high performing IT function, we suggest that the City should plan to invest in personal and organizational development work within the IT Branch.

This would likely be in the form of various programs, including:

- 1. External mentoring programs for leaders and management in the IT Branch
- 2. Education and training programs for leaders and management in the IT Branch
- 3. Team development and team building work with a focus upon accountability and building stronger collaboration

# **3.3 Demonstrating Value from Investments Technology**

For some at the City, the connection between service delivery and the technology that supports it is not as clearly understood as it needs to be.

The City makes investments in technology and business transformation projects to achieve specific business outcomes – improved customer service, increased staff productivity. The City should invest in initiatives that will provide the biggest return on investment.

Going forward, clearly defined **business** outcomes should be identified up front as part of defined business cases and their achievement measured as part of a benefits realization program.

In the interim, as the City builds the capability and capacity to identify, track and measure business benefits holistically across the portfolio, we suggest that the City develop a series of case studies that demonstrate and highlight the business value that has been achieved from technology investments (e.g. CRM, fibre partnership with OPUC, tax billing, mobile parking).

We also suggest that the City invest time and effort in helping Council understand the importance and impact of technology through a series of on the ground show and tell sessions that help them understand how important technology is to frontline service delivery.

# **3.4 Managing Demand: A Functional Governance Model**

### **3.4.1 Decision Making Responsibility**

The City does not repave all its bad roads every year, it has to prioritize. The same is true of its technology and business transformation projects.

Fundamentally when you have more to do than you have capacity (funding and resourcing) to do it, you need to prioritize. In doing so, many great opportunities and smart and innovative ideas have to be eschewed.

The City has built prioritization tools and mechanisms to assist in the selection process, but the results of the prioritization process are often questioned. Ultimately, these are tough choices, and someone somewhere has to decide what you are going to do.

Ultimately, we believe that these are key business decisions about corporate strategic priorities – and we recommend that CLT be actively involved in setting technology priorities. We don't recommend that these decisions can be delegated to a lower level Steering Committee – such as ISSC.

Some municipalities have chosen to have their CLT team operate as the City's strategic technology decision forum. Other organizations, such as Whitby have established a sub-group of the Executive Team to provide the governance oversight.

In Whitby their T3 (Technology Transformation Team) group is their Executive governance team, which is made up of the CAO, 2-3 Commissioners and the Head of IT. This group is responsible for setting technology strategy and priorities, technology policy and monitoring progress against strategic targets.

A similar approach could be suitable for Oshawa, whereby CLT and the IT Director could form a similar group.

The terms of reference for this group is included in Appendix 2.

In support of the work at the governance group, most municipalities establish a series of working groups or Steering Committees to plan and prioritize the roadmaps for key systems and programs. As such cross-functional groups are typically established at the Director and Manager for key enterprise platforms (Finance and HR - ERP, Work and Assets – WMS, Information Management – ECM and Collaboration, GIS and Data).

# 3.4.2 Improving the Technology Project Intake Process – Learning More before deciding to Commit

The IT Branch and ISSC operates a project intake process. This is a good start, but we suggest that it is revised in a number of ways so that the City can collect more intelligence and conduct more due diligence before it commits to projects and budgets:

- 1. The City should revise the idea and concept development stages to spend more time to fully understand the business problem intended to be solved, considering the true user experience and customer impact
- 2. Develop business cases for technology projects that clearly capture the business goals and business outcomes that will be achieved
- Develop project budget estimates that adequately estimate the resource requirements to allow for effective resource matching (and budgeting for contract resources where necessary)

# **3.4.3 Managing Technology Portfolio Investments**

The City should more carefully consider where it invests its effort and resources. Just like any portfolio it should spread its investments wisely.

Run, Grow and Transform categories are typically used to help organizations understand and manage their technology investment effectively.



A recommended ratio of projects across these portfolios is 60:20:20.

What we notice is that the City is, at this point in time, heavily over-indexed on Transformative type projects (e.g. Maximo and CityView), which means that Run and Grow projects are likely being deferred. Balancing the portfolio more reasonably would be prudent.

The City also must be realistic about what it can achieve within any given year. Working with one client recently, 32 new projects were requested in the annual budget process, when the previous year the client had only completed 10 projects. Over-committing

creates unrealistic expectations, stress and poorer outcomes, and a compounding effect where more and more projects are piled on to an already over-burdened team.

Looking at previous performance as a predictor of future performance is a valuable yardstick of how many projects of what sizes can be achieved within a single year.

So, we recommend that the City conduct a review of previous years and set a reasonable target of the number of projects that are achievable in future years (based on past history this may be in the order of 10 - 12).

We suggest that the City adopt the targets for the three categories at the 60:20:20 ratio as the way of building a balanced annual portfolio with the Governance group.

### **3.4.4 Understanding Available Capacity**

The City needs to better understand what resources (in IT and business units) it has available for projects. IT staff have for this project recorded a snapshot of their time allocations to project and operational work. This data will be valuable over time as the City focuses upon activities to reduce the amount of time consumed with operational and unplanned work, re-directing effort to increase the throughput of run, grow and transform projects.

Going forward a more robust method of tracking time will be required, and IT Management must ensure that this data is complete and consistent as it will be a key tool in matching resource capacity to the proposed project portfolio.

### **3.4.5 Selecting Projects**

The City has built a ranking scheme that it uses with ISSC to help it prioritize and support the selection of projects for the City. While such ranking schemes are a best practice tool to guide decision-making, they are never perfect and at best can provide guidance for decision makers.

We suggest that working with the proposed Governance Team the ranking scheme is used and adjusted over time to support the prioritization and selection work.

# 3.5 Becoming a More Tech Savvy Organization

While we have focused on the IT Branch, the role of Commissioners, Directors and Managers in Branches is equally important to championing digital and achieving success with technology.

### 3.5.1 Increased Business Leadership Tech Savvy

To become a more tech savvy municipality that better leverages technology, the current and future leaders of the City need to understand technology, the potential of digital and how to successfully implement technology and digital enabled change. This does not mean that leadership must understand at a technical level the details of the technologies, it also doesn't mean *"being good with computers"*; more that they have a good conceptual understanding about what it means to be a digital organization, and how to be successful implementing digital and technology driven change and capabilities.

We suggest that a digital/technology education program should be instituted at the City to help leaders and managers fully understand and embrace the potential of technology and understand what it takes to realize the promised benefits.

### **3.5.2 Business Leadership for Business Transformation**

While the IT Branch *is* responsible for helping business unit's implement technology driven change; technology and digital thinking needs to be at the heart of business strategies for each business leader - technology cannot be an afterthought or an add-on, it must be central to the achievement of business outcomes.

Furthermore, moving from paper-based to digitized processes involves persistent organizational as well as technological change for each business unit and for IT. Such change is a genuine transformation – work practices and processes change, interactions with customers change, job roles and expectations change as a result of the implementation. Active leadership from business leaders and managers is critical to the success. Leading from the front and leading by doing are key. Leaders shouldn't ask staff to use systems, if they are unwilling to use the systems themselves.

When working on initiatives across multi-disciplinary teams, it can be difficult to know who is accountable. Apple uses the term "**Directly Responsible Individual**" (DRI) to refer to the one person with whom the buck stops on any given project, task or activity. The City could borrow this concept and terminology in technology program and modify Executive Sponsor to Directly Responsible Individual.

Every project should be assigned a DRI who is ultimately accountable for the success of that project. So, for the implementation of the corporate HR system, while there are numerous stakeholders throughout the organization, the DRI is indisputably the HR Director. Note that success of that initiative should not be measured simply by the completion of the project or implementation of the solution, it is the achievement of the desired business outcomes – reduced number of payroll errors, reduced time spent processing timesheets, ability to easily and quickly generate workforce metrics (headcount, vacancy rates, etc.) - that must be identified before the project starts.

The Directly Responsible Individual is responsible for providing the vision and leadership for the project. The DRI has a very active/proactive role to play - not as a figurehead sponsor of a project, but as someone that is guiding and evangelizing the realization of the business capabilities as well as eliminating the barriers that impede their achievement.

# **3.5.3 Digital Education and Training for Staff**

Since the mid-2000's municipalities have typically neglected training. Train the trainer has become the de-facto mode of delivering training because it is cheap – not because it is a good model. Rolling out new collaboration technology – Skype, for instance – without the requisite guidelines.

At this time no one in the organization has clear accountability for technology training, and no resources are specifically allocated to it.

The following roles and responsibilities regarding training is a model that the City could adopt, if funding and resources allow:

Area	Description	Role / Responsibility
Corporate training needs	The development of a corporate technology training requirements analysis identifying training needs across the organization.	IT Director/ Executive Director HR
Technology training program design and development	Development of a training program informed by corporate training needs requirements and that reflects the delivery preferences of staff – e.g. Lynda.com, offline, self-study, lunch and learns	IT Director/ Executive Director HR
Corporate Training – Standard Productivity Suites	Coordination and delivery of training around productivity suites – e.g. Office, Adobe	Coordinated by HR in partnership with IT as part of corporate training program
New technology product	Coordination and delivery of training around productivity suites – e.g. Office, Adobe, Skype	Coordinated by project team, following training delivery standard
Business Solutions Training	Initial and ongoing training in the use of business systems	Departmental SME's with support from vendors and project team members

In addition, the City should ensure that new staff being recruited to the City have requisite technology skills by modernizing job descriptions and ensuring that staff in key roles – such as Directors - have the modern technology and digital skills required to lead digital transformation. One idea to consider is a concept called reverse mentoring – where an experienced senior staff mentors a new member of staff in business acumen and in return the new staff mentors the senior staff in modern technology skills.

Another concept that aligns well with TeachingCity, is for the City to harness the energy and knowledge of the student body to help with digital evangelism, digital handholding and education. Using intern and placement programs the City could use these groups to help raise the level of digital comfort and acumen within the organization.

### **3.5.4 Digital Savvy Network**

The City should also recognize that there are many staff at the City, outside of IT, who are digital and tech savvy – people who have grown up with or who have grown comfortable using and working with technology, and thus are constantly looking for ways to apply technology to their day-to-day work.

The City could harness this energy, enthusiasm and knowledge by establishing (on a volunteer basis) a Digital Savvy Network of staff.

This could be an informal and fluid group that could be an important contributor to pushing the IT Branch to adopt new technology faster and will be actively involved in identifying new technologies. The City's IT and business leaders could get into the habit of asking: "What does the DSN think about this idea?", "Have the DSN been involved in testing this idea?".

The goal is that this group of tech savvy people should become the IT Branch's best friends and the IT team should actively cultivate their relationship with them.

The IT Branch could work with this group to:

- Introduce and (beta) test new solutions and capabilities with the group, before broader rollout;
- Seek feedback on IT services and solutions to identify opportunities to improve the quality and experience of those services for tech savvy and all staff groups;
- Encourage (online and offline) discussion amongst the group on new service ideas, opportunities and needs;
- Encourage them to evangelize new products and services with their peers in departments.

# 3.5.5 DRI – Leadership from the Top

When working on projects across multi-disciplinary teams, it can be difficult to know who is ultimately responsible. As note previously, the notion of assigned a "directly responsible individual" (DRI) to projects can cut down on the paradigm of deferred responsibility which can often be associated with large scale technology implementations that involve cross-functional teams. We recommend using this concept and terminology to support future Digital and Technology programs at the City.

Every project can be assigned a DRI who is ultimately accountable for the success (or failure) of that project. Success is not simply the completion of the project or implementation of the solution, it is the achievement of the desired business outcomes - improved customer experience, new capabilities, increased efficiency, improved reporting and data management and so on.

A DRI should report directly to the highest level of IT governance and/or be a member of CLT as they can represent the project both from a technology and business perspective. DRIs do **not** need to be technologists, they need to have the ability to work

with technology partners (IT Branch + 3<sup>rd</sup> parties) to understand what barriers and opportunities are associated with realizing business outcomes and then translate them to their peers. An active DRI supported by a PM and project team should be able to:

- Promote engagement and collaboration on projects to ensure varying perspectives and requirements are met early on
- Help co-create the project mission and charter and reflect on it **regularly** (with big projects the 'why' can often be forgotten remind people!)
- Document roles and responsibilities and make changes as they happen
- Support project resiliency and respond calmly to setbacks and course corrections
- Translate progress across the organization and to Council and CLT
- Build frameworks and collect data to analyse project performance
- Expertly communicate and find the answers you don't have
- Be open to feedback but make decisions when the time comes to do so
- Inspire trust that you are driving the project lead by example
- Think strategically but stay close to the details (task level)
- Assign new DRI's to cover the areas you can't, but ensure they report back to you as the project DRI is where the buck stops!
- Pick up loose ends and predict where resource issues, budget and performance might lead to barriers
- Be open, transparent and ready to arbitrate against competing business needs
- Leverage strategic relationships across the organization in support of the project
- Think about the future state install a framework and plan to measure success following the project
- Facilitate and document the learning from a project to help sustain continuous improvement and inform future projects

# 3.5.6 Pre-Implementation Work: People, Process then Technology

Given the pace of technology, it's easy to be sold on the prospect of new tools driving digital transformation. Clearly, we realize that technology plays a critical role in generating value, but technology is very ineffective without the underlying processes and people to support it. We have seen far too many technology projects fail because

there wasn't an adequate amount of attention paid to people and process. Real value and a return on investment is realized when all three facets are in unison – this needs to start and be maintained throughout the life of a project and following implementation. Too frequently in organizations, projects begin without an adequate understanding of what it is and why it's important. Project management methodologies and the DRI model can help focus efforts to undertake the necessary work up front to define and codify the five W's. These questions need to



be answered collectively, by those that will ultimately manage, use and consume the technology.

People are the key here – frankly nothing will work if the resources are either unavailable or uninterested. People need to see value in change so it's important to never loose sight of the outcomes. Change management is the driver to ensure that people are in place to support a process but, most importantly, they are also motivated and empowered to do so. A change management process should be part of any major technology project to some degree. It can be as simple or as complex as a project group determines necessary, but ultimately, there needs to be pre-work completed in order to determine who and how people will be engaged throughout the engagement. This starts with selecting the right people as contributors to the project work but also should include a plan of regularly communicating the prospective changes to others outside the immediate project team. Everyone from front-line users to decision makers within the organization need to be considered - because at the end of the day, if technology is not used effectively, processes break down and people become demotivated and more likely to 'do it their own way'.

Some suggest that any process supported by technology should also be able to function in the absence of said technology. Clearly, we *want* automation, we *want* to get away from manual paper processes, however, there is some value in this notion. By looking at a business process (or mapping one that doesn't exist) void of technology, a team can better understand the key attributes that will ultimately make it successful. Technology should simply enhance, automate and make life easier for the people supporting it.

In general, we recommend spending more time to set-up and position projects for success rather than racing to the project. Yes, this can take more time to manage, but it's a valuable investment that will lead to more engaged people and more refined processes that can optimally be improved by technology and automation.

### **3.5.7 Procurement Processes**

Truly understanding the problem you are trying to solve using people, process and technology is really essential. Often, the municipal procurement process can compel RFP's to be overly prescriptive and limiting. This is not to say that procurement by-laws should not be followed, it's simply to suggest that external implementation partners often have a multitude of approaches used to fully understand civic technology problems and methodologies that best apply to the characteristics of an organization. In order to be agile and responsive to the real challenges that can be mitigated by using technology, the City should leverage the experience and knowledge of outside partners to help contextualize the issues at hand and customize a plan to address them. In short, RFPs should provide enough detail to account for the need through a description of the symptoms of a problem but be open and flexible on the way in which it's addressed.

The procurement process can also be adapted to better fit the procurement of technology. Frequently, standard municipal processes and templates are used for everything from salt to roadwork to consulting services to computers. Few organizations

in the private sector possess the complexity and diversity of operations as governmental organizations. Effective procurement needs to be tailored to the needs of the ask, which are vastly different between Branches.

Some municipal organizations are investing more time in collaborating between legal, purchasing and IT areas to ensure that regulatory measures are met but that other considerations specific to technology are also baked into the RFP. Requirements around support and maintenance become far more complicated when considering cloud solutions. SaaS solutions present municipalities with great opportunities to innovate through external partnerships but they also require a more stringent adherence to vendor management in order to ensure negotiated terms are realized through implementation projects.

Agencies from all levels of government (<u>Canada</u>, <u>Ontario</u>, <u>Guelph</u>, <u>Brookfield White</u> <u>Paper and case study</u>) are also now experimenting with 'challenge-based procurement' models. These pilots intend to give better access to external proponents by entrenching them within municipal operations to gain a better understanding of the problem area(s). They can also provide greater accessibility to smaller firms who may be able to deliver on projects in a nimbler and more cost-effective manner. These pilots are not without risk; however, they are gaining popularity in support of what appears to be a watershed moment for government procurement in general. This is something to monitor and actively look for projects that may lend themselves to such an opportunity.

### 3.5.8 Multi-Disciplinary, Co-Located Teams

It is important to remember that projects, initiatives and solutions are developed and delivered by teams – not by Steering Committees. Thus, it is important that the City build effective product and project teams that combine business subject matter experts, project management, business analysis, and technical expertise, alongside frontline users of systems to support the execution of projects and product enhancements.

Co-locating teams and ensuring that teams meet frequently (daily huddles, retrospectives) are demonstrated to improve team cohesion and project outcomes. The concept of entrenching technology staff (at least for a period) within the operating areas is another deliberate decision made by many organizations to both build better relationships between IT and the business and also better define the business problems that could be solved, in part, by technology.

Skunkworks teams are another model that can help facilitate multi-disciplinary problem solving around real problems. Essentially, these tend to be smaller projects that include IT and select business partners who employ design-thinking methodologies to innovate and positively disrupt an existing or new process. It is recommended that these loosely structured teams follow a PM protocol, however, after problem definition they can be almost entirely be focused on prototype development and testing. These (often entirely seconded) teams need to embrace and be supported by a 'test and learn' culture as experimentation and failure is a reality of such work. If cultural change can be managed

to support a skunkworks team, they can lead a re-imagining of legacy and radical transformation that is difficult to conceive of introspectively.

### **3.5.9 Agile Approaches**

More modern 'Agile' approaches to project management are also being used effectively by many organizations including municipalities to speed delivery and improve project outcomes<sup>8</sup>.

### Agile

Agile is an iterative approach to project management and solution development that helps teams deliver value faster and with fewer headaches. Instead of going all in on a big bang launch, agile teams deliver work in small, but usable, increments. Requirements, plans, and results are evaluated continuously, so teams have a natural mechanism for rapid response to change.

We would encourage the City to incorporate Agile techniques into its project management toolkit and use these to inform the way it approaches projects. Specifically, applying the minimum viable product approach, using an iterative solution delivery approach – breaking larger deliverables into shorter sprints, actively involving the user, showing concepts not explaining concepts, and co-locating project teams are key factors that the City should be utilizing.

<sup>&</sup>lt;sup>8</sup> https://www.pmi.org/learning/library/apply-agile-methodology-nonsoftware-enterprise-projects-9273

Some projects are well suited to Waterfall approaches, while others are well suited to Agile approaches.



Figure 7: Contrasting Agile and Waterfall Methodologies

The IT Projects and Portfolio Manager should play a lead role in establishing the methodologies applied, training teams and team members, and assisting management and staff in applying the methodologies consistently to manage projects. Agile requires an acceptance that projects will be managed in entirely new way. Users will have greater transparency into the evolution of products. This is new to many as waterfall techniques often didn't release a product to users until the testing phase. Being able to provide input along with seeing a representation thereof throughout the project is a valuable way to support engagement throughout as participants can see how their inputs directly lead to improvements built within a system. Given that this is a relatively new discipline for the City, it is recommended that use of agile start with a smaller project so contributors can help refine a framework that can be repeated in the future. In our experience, effective use of agile to support project management can lead to better outcomes as well as enhance two-way communications and better relationships overall between IT and business areas.

# 3.6 Technology Investment / Spending

# 3.6.1 Increased Technology Investment

Given the long-term funding needs for IT, the City should review its Technology Fund to determine an appropriate annual allocation, while also considering how appropriate

reserves can be established to fund future technology investments including those arising from lifecycle replacement – particularly around major systems, such as PeopleSoft.

### **3.6.2 Investment – Funding Sources**

To facilitate the increased investment and ongoing support of technology the City should also look to alternative funding sources outside of the IT envelope. It is in the ongoing operations of technology that the City faces the toughest challenge. For every new technology implemented, new demands are placed upon the organization to support and maintain the technology. The City should continue to explore a range of alternative funding sources to support technology investments that have been pursued successfully by other municipalities. These include:

- **Development Charges** supporting technology investments related to growth e.g. fire mobile technology, traffic light pre-emption, public Wi-Fi provision. Note the City of Vaughan has made changes in its Official Plan to address the need for public Wi-Fi in City facilities.
- **Building Permit Reserve** used to directly fund permitting technology and indirectly fund upstream and downstream technology and process improvements that contribute to improved permitting process e.g. planning application processing technology
- **Gas Tax** used to fund technology projects related to Asset Management e.g. City of Waterloo received an FCM award for investing over \$700,000 of gas tax funds into its asset management systems
- **Departmentally Funded Technology and Resources** e.g. in Burlington additional corporate IT staff have been paid from the Fire budget, providing additional resources to support Fire, but centrally managed and coordinated resources.
- **Grants and Challenges** e.g. Smart City Challenge, FCM Asset Management, Community Improvement
- **Growing revenues to offset technology costs** e.g. Advertising linked to digital services
- Services Surcharges (specifically on B2B services) to fund implementation of digital services e.g. building permit or planning application 'surcharge' diverted to a fund to support the implementation of digital services that reduce costs for those using the service through for instance reduced plan printing and visits to City Hall.
- **Technology Levy** some municipalities have introduced a levy to fund investment in community technology. For example, the Town of Caledon has introduced a "broadband levy" to address improved internet services in their community<sup>9</sup>.

<sup>&</sup>lt;sup>9</sup> https://www.caledon.ca/en/business/Internet.asp#broadband

# **3.6.3 Transition from Capital to Operating**

Another major change that will have an impact on the City's technology budgets; technology expenses are beginning to shift from capital to operating budgets.

In recent years, the technology industry has rapidly moved from a buy to a rent model.

As cloud services have popularized subscriptions, almost all IT software and services are now shifting to a subscription basis, so there is no hiding from this new business model. This has the benefit to the City of lowering the up-front capital investments required to get technology up and running, but it shifts costs to ongoing operating budgets – and a potentially higher total cost of ownership.

The City must prepare financially for this transition as IT operating expenses should be expected to increase substantially as subscription fees increase as a proportion of overall IT costs.

Capital funding will still be required to support project implementations (professional services, staffing), hardware and other technology procurement, but it is reasonable to assume that much of the City's software expenditures will gradually transition to subscription and thus operating accounts over the next 5 years.

# 3.7 Summary

In this section we have intentionally focused on how IT is governed, managed resourced and funded because we believe this is at the heart of the challenge that the City faces. By addressing the underlying factors to establish the right engine for delivery of technology solutions and business transformations, the City will create a much needed business transformation capability.

The next section turns attention to the work that the tuned engine needs to tackle.

# 4.Key Technology Themes and Initiatives

We believe that focusing upon delivering great experiences (for customers and staff) should be the key driver for the City's technology strategy. Council in particular was interested in opportunities to improve customer experiences through the implementation of digital technologies.

The City's workforce and community should be fully empowered by modern technology, digital solutions and capabilities. If we view both groups as key customers of our technology and digital solutions, the goal should be to build great, self-service experiences for them.

# 4.1 Digital Services for Residents and Businesses

The City is in the customer service business and its goal as a service provider is to provide easy to use, simple services. In today's world, residents used to banking and buying products and services online, also expect to be able to access government services from their smartphone or their tablet any time and from anywhere.

So, in future customers should be able to visit the City's website to easily and quickly:

- Report a problem and track its resolution (receiving updates along the way);
- **Make a booking** (e.g. recreation programs, facilities and rooms, inspections, event);
- Make a purchase (e.g. parking exemption, garbage tag);
- Make payments and manage accounts (e.g. pay an invoice, pay a ticket, set up a direct deposit, review a tax account, request a tax certificate);
- **Submit applications & drawings** and track the application progress (e.g. Development Applications, Permits, Licences, etc.);
- **Submit digital forms** which remember information that has been previously provided (a customer's address) and validates information before submission to reduce errors (e.g. grants, delegations, etc.).

We expect that increasingly the community will use digital services as the best and preferred way to interact with the City.

This doesn't take away from the important role of Service Oshawa and the face-to-face and telephone-based services that they offer. The City will continue to offer choices to customers to interact using their channel of choice. The expansion in digital services reflects the fact that there are many in the City (92% of Canadians have access to the Internet at home, 76% have a smartphone) who simply prefer to interact using the smartphone or the web.

### An Illustration of the Digital Plan and Build Process

Let's imagine how a Digital service for Planning and Building would work.

Kevin is building a new home on a lot in City. He goes to the City's website to review what is required before he starts. An easy to use wizard steps him through the process and he realizes he needs a minor variance before he can begin the build.

Kevin starts a minor variance application online, fills an online form, which validates the data he enters, to supply the City with the required information. He attaches drawings of his proposal from his architect and pays for the application with his credit card before clicking submit.

City Planning staff receive notification of the application, they validate that the correct details have been provided and start a series of workflows which allocates tasks to City staff required to review the application.

Details of the application are automatically published on the City's website and those that subscribe are notified of its receipt.

Kevin is emailed a copy of a sign that must be printed and shown onsite. The sign has simple details of the application and a QR code that allows anyone passing by who is interested in finding out about the application to scan the code and be directed to more details of the application on the City's website.

A few days later, Kevin uses his smartphone to check in on his application and sees that it is due to be discussed at the next Committee of Adjustment (COA) meeting. He wants to be there, so he adds it to his calendar.

The COA approves Kevin's application and he is good to go.

Next Kevin needs a building permit for his new build.

He logs back into his City account on the website and initiates a building permit application - using the information that he previously submitted for his minor variance application. He adds additional drawings and required information to complete the permit application, again pays for and submits his application.

This time Building staff are notified of the permit application and they begin the process of reviewing the permit application. They use the same system as the planning team so they can easily review the details of the minor variance request.

Once all reviews and tasks are completed satisfactorily the City issues the building permit - emailing a permit to be printed by Kevin and posted at site - this too has a QR code on it.

A month goes by and Kevin's contractor is now on site and has completed the footings work. They require an inspection of this work before they can proceed. The contractor uses his smartphone to login to the City's website and book the next available inspection.

Stephanie, the building inspector for that area is notified of a new inspection the next day. The following day she heads to site and conducts the inspection. She uses her connected tablet to review the details of the application and record the results of the inspection, completing a checklist of tasks, taking photos and making notes. At the completion of the inspection she marks the inspection as completed, with a pass. The system automatically emails Kevin and his contractor the results of the inspection and work on site can proceed.

Although this presents a stylized and simplified example, this is the actual way that Plan and Build services in some municipalities across Canada and in many municipalities across the world work. This is the vision for the way services at the City could and should work.

# 4.2 Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions

However, before the City can deliver truly great end-to-end digital services as the Digital Planning and Building example above back office processes must be digitized so that staff manage internal workflows and approvals digitally – as the City is doing with the Maximo and CityView projects, for example.

### What do we mean by Digitized Processes?

Well designed, standardized and digitized processes are the foundation of a well-run municipality, and Business Solutions enable the operation of digitized processes.

A process is a series of steps taken in order to achieve a particular goal or objective. Processes codify the way that the City handles a permit or a request, a complaint or a license, issues bills and receives payment for taxes or grant applications - ensuring that each request is handled the same way.

In the best case, processes are designed to be efficient and to take advantage of modern capabilities. Technology-based business solutions enable processes to be digitized, automated and enable staff and management to manage processes at scale, for example, to process tens of thousands of recreation program and summer camp bookings, or thousands of permit applications each year.

Today, too many of the City's processes are paper based and manual, or run using Excel, which acts as an anchor upon the City's operational efficiency, inhibiting productivity and hampering the ability to deliver improved services and experiences.

When processes are digitized into robust business solutions, all necessary transaction processing - workflows, tasks, notifications, quality checks and validations and approvals - can be carried out digitally, using a computer, and can happen anywhere (in the office, at a work-site, in a truck at the side of the road, or from home).
Offline steps (manual interventions such as checking a paper file or getting a physical signature) are largely reduced to the point of elimination.

Business solutions are shared across departments and branches so that tasks initiated or completed in one area can automatically trigger a task in another, such as a change in a permit status (in Building) which could trigger the processing of a preapproved payment (in Finance). In such a situation, payments can be processed faster, improving City cashflows.

The digital process chain provides complete visibility of the process throughout the City – authorized staff can easily check on the status, review previous actions or find out required information, without needing to search for a paper file. Systems manage the routing and workflow of processes, including escalating items to senior staff and management when exceptions are encountered, or where performance falls below defined levels of service.

Digitization allows management to track team and workgroup processes and monitor Key Performance Indicators that provide insights to improve process effectiveness, or to support more effective allocation of City resources.

Today, still too many of the City's processes run using paper and pen or excel spreadsheets – and not in digitized systems (timesheets are filled on paper, permit applicants come in to City Hall in paper format, other licences and permits for filming or patios require applicants to download a form, fill in the details and bring the form into the City).

Two of the City's major business solutions (WMS and LMS) are in the process of being replaced. But the City must recognize that in each case the initial project is the start of a long journey. Full realization of the benefits of WMS and LMS can and do take many years to be achieved – and multiple iterations and follow on phases of work. Once the WMS has been implementation a constellation of other needs around Asset Management and Decision support will need to be addressed.

Significant enhancements have been identified as broad corporate needs around HR process management, and a similar roadmap around Finance Systems enhancements is required. A number of aging systems must be replaced or upgraded – such as the City's Tax Management system and the CRM system. Other systems gaps include ECM, Agenda and Minutes Management, enhancements to parking and enforcement solutions.

# 4.2.1 Mobile Tools for the Mobile Workforce

Just as a FedEx ® or UPS ® driver uses a mobile device to track delivery of your parcel and get your signature, City staff that work out of the office should have access to similar technologies to collect data, track work orders, complete inspections, access asset history, view drawings and to conduct surveys.

Mobile will be central to the realization of the full benefits of Maximo, CityView and Officer projects. Mobile and field staff will be connected into the digitized business processes discussed above. Using mobile technologies (including connectivity and security, devices, and business solutions) to access the City's information while mobile. This will allow a customer request (about a downed sign, for instance) to be directed to a field crew and their completion can be tracked by back and front office staff.

#### Mobile Increases Customer Responsiveness and Satisfaction

A stop sign has been knocked over. A passing customer takes a photo of the downed sign and sends a request to the City for a repair. The notification is received, automatically categorized, geo-located and recorded in the City's customer request management and dispatched to the City's work management system (Maximo) for resolution. The work management system automatically dispatches a request to the nearest crew in the area who receive it on a laptop in their work vehicle. As an emergency work order, they head to the site and erect a temporary stop sign. A couple of days later, the sign crew visits the site and replaces the stop sign. They take a picture of the fixed sign and the customer receives a notification on her smartphone that the issue has been resolved.

# 4.2.2 A Modern Workplace for a Modern Workforce

If the City is to be a more modern, digital organization, then it must also make available simple and easy collaboration capabilities for staff – enabling staff to do their best work by using the tools best suited to the job. They should be able to work from anywhere at any time and those experiences should be simple, easy and embrace self-service.

The modern workplace would include:

- Increased use of mobile friendly devices laptops, tablets providing individuals and teams with choices of devices that best meet their needs;
- Digital meetings real time meeting notes, improved and broader adoption of web meetings, screen sharing;
- Team messaging and chat helping co-workers connect and interact in real time;
- Shared project collaboration spaces helping internal teams work together, track projects, assign tasks, share document, but also enabling improved collaboration with partners, vendors, and the community;
- Improved document collaboration, versioning, co-editing;
- Large file transfer and sharing;
- Easier presentations in City meeting and board rooms with standardized technology in each;
- Increased adoption of remote and flexible working enabling staff to work from the office, from a partner's office space, from the side of the road, from a coffee shop or from home.

Importantly the City's culture must embrace these technologies, and the workforce must be trained and comfortable using the technologies - making it commonplace to take advantage of them.

# **4.2.3 Becoming Data Informed and Data Driven**

Today, information that the City holds in key systems (such as PeopleSoft) is difficult to access in a timely manner. Those that manage large and long running capital projects find it challenging for instance to monitor project budgets against actual expenditures – typically resorting to maintaining their own tracking systems in Excel.

Further, as the City increasingly digitizes its processes and uses business solutions to manage its workflows and work assignments it will collect more data about the services it provides, the way staff work, the impact of policy decisions. Thus, Council and the City's leadership, management and staff will use data to make decisions that help optimize resource use and reduce service delivery costs and complexity.

So, moving forward the City should expect to

- Use data from the City's CRM to demonstrate the potential of data analytics and visualization
- Establish a data strategy and evolve data best practices at the City
- Establish master and authority sources of data that all at the City and in the community can rely upon
- Use data, analytics to inform decision making and to help optimize our application and use of resources;
- Embed GIS / spatial understanding into more of the City's processes.
- Use dashboards and performance measures to monitor and communicate performance internally and to the community

#### Using Data to Optimize for Community Benefit

City Fire officials in London were determined to reduce residential fires in the City. They turn for help to data collected over the years on residential fires. Spatial analysis identifies a number of hot spots in the City with a higher propensity for residential fires. The combination of this insight with data about the type, severity and cause of fires and other demographic and socio-economic data, allows Fire officials to identify important characteristics of fires in these hot spots – such as unattended cooking and smoking. This information helps the Fire department target its resources more effectively – with concentrated communications and advertising, fire prevention education and inspections – the City achieves a 10% reduction in residential fires, significantly reducing loss of life and property in the City. So, the five core areas of opportunity that we think it is important for the City to pursue are:

- 1. Digital Services for Residents and Businesses
- 2. Digitized End-to-End Business Processes supported by Fully Utilized Business Solutions
- 3. Mobile Tools for the Mobile Workforce
- 4. A Modern Workplace for a Modern Workforce
- 5. Becoming Data Informed and Data Driven

# 4.3 Key Projects

So, what are the key projects that will support achievement of these themes? The following are the initiatives that have been identified as the key projects at this stage.

- Initial Maximo Deployment + subsequent Maximo Evolution Stage 1, 2 and 3
- Road Patrol solution (Minimum Maintenance Standards mobile inspections solution, to be integrated with Maximo)
- Additional Asset Management and Decision Support solutions (e.g. Pavement & Bridge management, Hydraulic and Traffic modelling solutions)
- CityView + subsequent CityView evolution Stage 1, 2 and 3 (e.g. Contract Management, permits – including Sidewalk, Patios, Film, Signs, Easements, etc.)
- Digital Plans Management establishing shared corporate standard around digital plans handling
- PeopleSoft Finance Roadmap and ongoing enhancements (including Fixed Capital Assets, improved project and program-based project reporting)
- Tax Systems Replacement
- CRM Upgrade (and integration with Maximo and CityView)
- HCM replacement (Employee Records, Payroll, Time, Attendance & Scheduling, LMS, Org Charts, etc.)
- Office 365 implementation collaboration spaces, including relaunch of Skype, and Enterprise Content Management (and supporting document, records management practices, policies and procedures)
- Mobile strategy to support mobile projects in CityView and Maximo space
- Microsoft Access DB Decommissioning
- Projects and Project Portfolio Management
- Public Wi-Fi strategy and enhancements
- Future POS and Payments Strategy
- Corporate GIS Strategy
- AVL and Telematics solution replacement
- Corporate Data Strategy
- Datawarehouse and Reporting, Analytics and Dashboards implementation
- Open Data expansion, City and Community Data Hub
- Digital Services expansion, including eForms, expanded online payments, etc.
- Officer

# **4.4 IT Functional Improvements**

The IT Branch is caught in a catch-22 situation; while the management group collectively recognizes that it operates in too much of a reactive mode, it is so busy reacting that it has little available time to implement required improvements that would drive efficiencies allowing it to be less reactive.

Many of the recommendations and suggestions brought forward here require investment in the short-term to save in the long-term. Implementation is dependent upon an injection of resource effort to backfill and release resources to drive the required changes.

#### 4.4.1 Updated Policies and Procedures

To support the direction setting, a policy framework that guides decision making and technology is important. While policy is designed to set out the rules, it also makes it simpler to make decisions because important decisions are codified in policy.

A comprehensive IT policy framework addresses the following topic areas:

- 1. IT Governance, Risk and Compliance;
- 2. Project and Change Management;
- 3. IT Procurement;
- 4. Service Availability disaster recovery (DR), business continuity (BC);
- 5. Acceptable Use an email usage policy or computer usage policy;
- Information Security focus on managing and protecting and preserving information (including personal information) belonging to the organization, which is generated by those employees in the course and scope of their employment;
- 7. Information Management focus on managing data, records and information such as its retention and destruction.

The City has some limited policies in place, while there is a corporate policy review underway, it is recommended that a review of all existing IT policies be performed, with the support of the IT Governance Committee, to help reframe and re-position the City's approach to technology.

Specific policy gaps must be addressed in the immediate term, with particular attention in the areas of Acceptable Use, IT Security, and IT Governance policies. Given the growing adoption of Cloud based solutions, a Cloud policy and strategy should also be developed.

New policy work should be developed through multi-disciplinary project teams collaboratively preparing material – which will be brought forward through the governance groups before being approved at CLT or Council as required – new resource capacity will need to be established for the IT Branch and the City to carry this important work forward.

# 4.4.2 IT Service Management Tools

The City's current IT service desk management platform is Spiceworks. It is limited in its capabilities and implementation. In support of the plans to improve IT Service Management processes and practices a plan should be developed in the IT Branch to implement a viable ITSM tool that can support all of the City's IT Service Management processes and needs.

#### 4.4.3 Incident and Problem Management Processes

Formalized Incident and Problem Management processes should be defined, documented and introduced. Incident Management comes into play when a significant issue happens, causing downtime or disruption to a key service. Problem Management is performed when repeated instances of the same issue occur over a period of time.

#### **4.4.4 Change Management**

A set of Change Control and Management processes should be re-introduced. Currently, significant changes are made to infrastructure and systems without a formal approval process, no notification to clients and a limited centralized log of changes to help with troubleshooting – should a change introduce a problem.

A full Change Management program is a best practice and should be put in place, with the following basic steps followed:

- Change Control Board to be formed;
- A formalized change window should be established;
- Change Request submitted to Change Control Board;
- Change Control Board approves (or rejects).

#### 4.4.5 IT Asset Management

While the Help Desk team use the existing ITSM tool to manage assets such as PCs and mobile phones, network equipment (servers, switches, etc.) are managed separately. IT Asset Management (inventory and processes) should be consolidated into a single Asset Management solution to provide management with a holistic view of the entire environment.

#### 4.4.6 Knowledge Management

An effective knowledge base can drastically cut service desk ticket volume. The City's Service Desk will not know the answer to every question that users ask, so it's important to have a place to look first for answers. If the answer is not in the knowledge base, they can add it once they've found the solution or workaround. Once they do, they've saved some time for co-workers when that question comes up in the future. For these reasons, knowledge management is an ITSM best practice that is essential for the City to embrace.

In addition to general knowledge for the user community, the City's Service Desk should centralize the technical knowledge base using ITIL best practices. The current situation includes documents stored in disparate systems with no consistent format. This could make it difficult for IT staff to locate a valuable piece of technical information whilst dealing with an incident.

# 4.4.7 On and Off Boarding Process

The on and offboarding processes are repeated activities that should be efficient and effective, automated and self-service where possible. The IT Branch should work on making this process effective.

# 4.4.8 Review Device Mix and Lifecycle Replacement Process

Despite the City having a good 3-year lifecycle replacement program on devices, there appears to be some frustration in getting the right devices to the right people in a timely fashion. We believe that the IT Branch should work with stakeholders to fine tune the process to ensure that the needs and requirements are effectively met, and that perhaps new device distribution can occur at multiple points throughout the year.

One important discussion for CLT to have is the extent to which in providing modern tools for the workforce the City would want to expand the distribution of laptops and other portable devices over desktops. A number of organizations have consciously decided to provide the majority of staff with laptops over desktops to enable more integration and flexible use of technology for staff – enabling collaboration, flexible working, etc.

#### **4.4.9 Formalize After Hours Support**

There is evident demand for IT support services before and after standard office hours – in areas such as Fire, Recreation, Council, Clerks Services, etc. IT support services are typically available during office hours.

The current out-of-hours support model, is based on the best efforts of management and staff within the IT Branch, is unsustainable and taxing on individuals and does not meet the level of service expected by these groups.

This issue can be addressed quite simply through increased expenditure.

Other municipalities have tackled this demand in a number of ways:

- 1. Introducing staggered helpdesk staff shifts so that IT helpdesk coverage can be available for extended hours (early in the morning and later into the early evening)
- 2. Introducing a 3<sup>rd</sup> party call-out service that triages requests taken out of hours and passes requests that meet agreed urgency or importance criteria
- 3. Introducing a formal call-out roster, including on-call / stand-by payments for staff that provide the after-hours service this service can be either tailored to or available for the particular service areas that require the support under an

agreed SLA or more broadly. In some cases, a chargeback model may be suitable to discourage use of the after-hours support model for issues that could wait for the next day.

There can be logistical issues related to the number of staff that could fill a stand-by shift, if the number of staff that can fill that shift is limited. So, some of these options are likely to be dependent upon growing the resource base to effectively deliver this level of service.

# 4.4.10 Establish Cloud Policy and Strategy

"The cloud" has emerged as a new mode of delivering technology solutions that can be deployed quickly and with low cost of entry, additional benefits include increased agility, reduced capital expenditures, and mobile readiness.

This has become such a widespread IT industry paradigm that it cannot (and of course should not) be avoided. The City has already adopted a range of Software as a Service (SaaS) Cloud solutions, and more solutions that the City implements are likely to be available only as cloud-based solutions. Office 365 and other modern collaboration solutions are born of and only available as cloud-based solutions.

So, going forward, the City must embrace the cloud and establish a formal approach and appropriate checks and balances in the form of a Cloud decision framework, corporate Cloud policy and standard operating procedures to ensure that set out the appropriate due diligence steps are taken when moving technologies and services to the Cloud.

Specifically, this will ensure that data security, long term sustainability and information privacy considerations (through the use of the Privacy Impact Assessment process recommended by Information and Privacy Commissioner of Ontario) are appropriately addressed, and that information and data management (specifically data integration) needs are tackled.

Furthermore, as Cloud computing transfers computing costs from capital to operating, the IT Service will establish a means of monitoring and projecting long term cost implications to ensure sustainability.

This is a new paradigm and requires new skills and capabilities for IT Branch staff and management to learn and evolve.

We would recommend that the City extend its use of the Cloud beyond SaaS into the Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) realms. This should begin with the creation of sandbox, development and testing environments when and where appropriate, as a means of familiarizing staff and the City with the technology, before introducing Cloud infrastructure and platforms into production situations.

# 4.4.11 Establish Technology Roadmaps

The IT Branch should develop roadmaps for its key technologies (e.g. facilities, network, storage, server / desktop, essential infrastructure services and corporate infrastructure applications).

#### **4.4.12 Project Management for ALL IT Projects**

The IT Branch must apply project management due diligence and best practices to all projects that it operates, including those activities that have been considered 'operational projects' in the past. The application of Project Management best practices is demonstrated to improve project outcomes and ensure that the right things are considered.

# 4.4.13 Establish Best Practices for Using 3<sup>rd</sup> Parties and Resources ondemand

As discussed earlier, the IT Branch needs to become more effective at using 3<sup>rd</sup> parties to help them carry out operational and project work. Establishing best practices and standards, preparing core documentation of existing environments is required to support this type of activity. This is a practice that other municipal organizations have successfully implemented.

# **5.Next Steps**

This report provides a lot of information and introduces numerous concepts and ideas for the City's leaders to consider.

The report is presented with the intent to start important conversations that we believe the City needs to have if it is to position itself to leverage technology more effectively.

We look forward to continuing the conversation with the IT Branch management team, CLT and Council and forming, from the ideas introduced here, concrete recommendations, an action plan and Corporate Information Technology Strategy to drive the City forward.

# **Appendix 1: Glossary of Terms**

While this report is written in as plain language as possible, a handful of technical terms and acronyms are used. This glossary is provided to help the reader understand the terms used.

Agile: Agile is an iterative approach to project management and solution development

**Back-Office:** An office or department where work is carried out to support the business of an organization, rather than being customer focused.

**BI (Business Intelligence):** This refers to technologies, applications and practices for the collection, integration, analysis and reporting of business information, and is designed to support better business decision-making.

**BIA:** Business Impact Assessment – an assessment that considers the potential impact of a disaster situation or loss of service on business operations

CityView: The City's Permits, Planning and Licensing solution

**Cloud**: A general term for systems and data that are not located on the organization's premises. Access to these systems and data is achieved through the Internet.

**CRM**: Customer Relationship Management system – a generic system for case management that can be used for handling customer enquiries

**Digital**: This term refers to a mindset, mode of operating, and delivery of services that takes advantage of modern technologies (web, app, social, mobile, data). These deliver improved experiences, business efficiencies and insights.

**Digitized**: This term means the automation of manual and paper-based processes, enabled by the digitization of information and workflows. Moving from an analog (often paper based) process to a computerized process.

**DR/BC (Disaster Recovery/Business Continuity):** A set of policies, procedures and practices that are designed to assist an organization recover from a significant IT failure

**ECM**: Enterprise Content Management system – designed to provide document and record management capabilities

**ERP (Enterprise Resource Planning):** A system that is designed to address business requirements across the whole organization (JD Edwards for example)

**GIS (Geographical Information Systems):** Systems designed to capture and report on all types of geographical data, including spatial data.

**HCM:** Human Capital Management System – corporate wide system for managing the workforce and workforce management processes such as employee records, payroll

**Infrastructure Architecture:** The hardware, software and other systems that comprise an organization's technology assets used to deliver IT services.

**ITIL (Information Technology Infrastructure Library):** A set of detailed practices for delivering IT services

**ITSM (Information Technology Service Management)**: The standards and processes used to define how IT delivers services.

Maximo: The City's Work and Asset Management system

**MTMM**: Municipal Technology Maturity Model – Perry Group's generalized maturity model used for assessing municipal technology environments

PeopleSoft: The City's Finance and HR system

**PMO (Project Management Office):** A group that defines and maintains project management standards for an organization. (PMO-Lite is a less onerous version that still allows standards but is not as formal)

**PPM (Project Portfolio Management):** The centralized management of all projects, potential and existing, to facilitate resource management, project delivery and status reporting.

**SAN (Storage Area Network)**: A dedicated high-speed device that interconnects and presents shared pools of storage devices to multiple servers.

**VOIP**: Voice over Internet Protocol – modern telephony systems sharing computer networks

# **Appendix 2: Areas Requiring Work**

The following table provides rationale for the assessment (colour coding) presented in the current state architecture diagram. The table provides information for those items identified as a gap, risk or where work is required.

Area	Opportunity	
Infrastructure		
Laptops	While the overall device fleet appears to be reasonably well managed, the recent introduction of Microsoft Surface's combined with Direct Access has resulted in some performance and reliability issues with these devices and with Wi-Fi which must be resolved.	
Wi-Fi	See note above.	
Storage	The common theme throughout the IT organization is an ad hoc approach to systems management; the storage environment is no different. While the storage hardware (SAN) is relatively new and therefore robust, there is no formal management capacity or performance of storage systems. The City needs to develop a proper storage management program – capacity being a big component since it effects the needs to tackle stale data, long backup times, and unnecessary costs associated with data replication and recovery.	
Cloud	The City has a big gap in the area and appears to be somewhat "cloud averse". A formal Cloud Policy should be developed that includes a plan to analyze the City's "cloud readiness" by identifying ideal workloads to consider as cloud migration candidates.	
Virtual Servers	The City does not analyze virtual compute workloads/applications in order to determine current/future needs. There is an opportunity to implement the tools to monitor workloads that will support a proper cost/benefit analysis pertaining to the capture of capital/operational/indirect expenditures.	
Exchange	The City needs to consider the option of moving its on-premise Exchange mail system to a cloud-based service such as Microsoft Office 365. The current situation lacks consistent standards in areas such as email storage and archiving.	
UC/Telephony	The Avaya system that the City operates has been updated in the last 2 years and there are a range of modern features and capabilities that could be rolled out (softphones, etc.), but also Skype for Business service (becoming Teams) and an upcoming Office 365 strategy suggests that there is a need to look at a unified communication and collaboration roadmap.	

Area	Opportunity
ITSM Tools	The City lacks proper change management procedures, problem
	management, and configuration management. There is an
	opportunity to re-evaluate the current ITSM solution (Spiceworks)
	and perform a needs analysis with a plan to procure a proper
	enterprise-class ITSM system.
Security	Although the City may have had security audits in the past, there
	are no formal processes in place to monitor network traffic, policy
	changes, security changes, etc. A formal security program needs
	to be developed to address these requirements.
Disaster	The City does not have a formal Business Continuity/Disaster
Recovery + BC	Recovery Plan. Systems are replicated to a secondary data
	center in a "high-availability" configuration but from a technical
	level this does NOT prevent a system outage due to a software
	corruption or data breach. The City needs to develop a formal
	BCP/DR strategy that will drive the technology requirements to
	ensure they meet the needs of the business.
Monitoring	The City needs to develop formal IT Service Levels (SLAs)
	supported by agreed upon targets monitoring, measuring and
	reporting on SLA's in this way will provide close links to Continual
	Service Improvement (CSI). Like many activities within IT, overall
	monitoring of the infrastructure is ad hoc at best.
IT Policies	The City needs to review its current list of approved IT policies
	and identify gaps in core areas such as: IT Governance, Risk,
	Compliance, Change Management, Service Availability,
	Acceptable Use, Information Security, and Information
	Management, and Cloud Usage. Some IT Policies exist but
	appear to be outdated and/or lacking formal standards. There
	may be a project planned within the HR department to
	review/refresh corporate policies, but it will be critical that II is
	involved to ensure key gaps have been identified and core I
Ducines	policies have been established.
Business Systems	
LMS (Land	The City's current system OLL is in the process of being replaced
Property	by CityView, with a plan to implement mobile capabilities for field
Permitting, Bylaw)	inspectors and staff, and to implement online permitting and
Management	licensing services using the CityView portal, as well as integrated
System	digital markup using Bluebeam technology.
Work	The City's current PeopleSoft Work Management bolt-on being
Management	replaced by Maximo work management solution.

Area	Opportunity
Asset	The City currently has a gap in Asset Management and Decision
Management /	Support tools; the City lacks Pavement Management, Bridge
Decision Support	Management and other infrastructure management systems,
	asset accounting occurs largely through spreadsheets and there
	are no systems in place to support asset scenario planning or
	coordinating asset investments across portfolios.
ECM	This represents a key gap in the City's technology platforms – as
	flagged by the RIM review, there is a lack of an ECM (enterprise
	document or records management capabilities) that should be
	addressed.
Intranet	The City has in the last 2 months implemented an eSolutions
	intranet solution which will provide all staff that work at the City
	access to valuable employee resources
Recreation	The City has implemented and gone live with Intelligenz as a
	replacement for the CLASS system that was previously used by
	the City for 20 years. Some functional problems and gaps remain
	with the new software and the project team continues to work
	with the vendor to address these problems.
HRMS	The City has conducted an external review, which has
	recommended moving away from Peoplesoft HCM and
	implementing a SaaS based, multi-tenanted suite of HCM
	solutions tailored to the City's needs.
Finance	The City uses and is generally satisfied with Peoplesoft as their
	core Financials supported by FMW for budget management.
	Ongoing upgrades and enhancements are planned to enhance
	the solution capabilities.
Тах	The City's self-supported Manta product is past end-of-life and
	must be replaced with a modern Tax product that supports online
	customer services (e.g. tax account management, self-service
	tax certificates, etc.)
Fleet	The City's fleet function uses the PeopleSoft work management
	bolt-on, which is planned to be replaced by the Maximo solution.
Fuel	The City uses FuelMaster to track fuel usage. The system
	interfaces fuel usage to MMS which flows to PeopleSoft (through
	to PeopleSoft Inventory). Integrations will need to be built for
	Maximo.
Agendas and	The City's agenda and minutes process is currently a manual
Minutes	process. The City will require an agenda and minutes solution.
Parking	The parking garage system (WPS) is planned for replacement
	starting later in 2019.

Area	Opportunity
MLELS	Currently uses OLI (to be replaced by CityView) to track
	complaints and enforcement activities. Public complaint input is
	through Service Oshawa with integration between Lagan and
	OLI. Parking fines and other Administrative Monetary Penalties
	AMPs are tracked through Officer (Groupe Techna). There is a
	project underway to implement several system enhancements,
	some of which were audit recommendations. Additional
	enhancements are planned for future phases.
Cemetery	The City's cemetery information is managed in a combination of
	GIS and excel sheets. Cemetery processes are expected to
	move into CityView as part of that project.
Facility	The City currently uses VFA for some asset planning functions,
Management	but operational Facility management is planned for inclusion in
0	the Maximo implementation.
MS Access	The City has many MS Access databases that currently run
Databases	important business processes (e.g. crossing guard payroll). Most
	of these standalone systems should be expected to be moved
	into Maximo or CityView as part of those projects or to be
	consolidated into other City systems as part of a program to
	eliminate MS Access as a corporate technology platform. Note
	that MS Access is not a suitable solution for corporate solutions
	and plans for replacement of those that are not consolidated into
	one of the City's other major platform should be made.
Integration	
Search and	The City does not have a search / discovery tool. Files are stored
Discovery	across multiple file shares making discovery difficult. An ECM
	solution could address this requirement.
Workflow Engine	The City has not implemented a Workflow management solution
	to make the implementation of digitized workflows and approvals
	quick and simple to implement.
Business	While various systems that the City operates provide reporting
Intelligence	tools and capabilities, the City has not selected or implemented a
	corporate Business Intelligence tool.
Data Warehouse	The City has not established a corporate data warehouse at this
	time.
GIS	While GIS is already used extensively throughout the
	organization, there are many opportunities to extend its use and
	application.
AVL	Although the City selected an AVL solution provider, the provider
	has been unable to meet the requirements set out by the City and
	thus the City has taken steps to remove the solution. A new
	solution will be required.

Area	Opportunity
Integration	Although the City has built a number of integrations between
Technology	solutions, the City has no current middleware technology to
	support application and data integration.
Data Standards	The City has done some limited work in this area – with particular
	attention to Address and People data. Major work regarding
	asset data is expected to support the implementation of the
	Maximo solution.
Customer	
Facing	
Apps	The City has suitably prioritized responsive design web services
	over the delivery of City services via the app model.
eForms	The City has purchased and implemented an eForms solution,
	but there are many (hundreds) of forms that should be converted
	to digital form format – but note that each business process
	should be reviewed and re-designed before simply converting to
	a digital form.
ePayments	In line with earlier commentary around POS, the City should
	establish a comprehensive set of payments handling methods
	and expand the availability of online payments for services,
	invoices and other payments.
ePlan, ePermits &	Online permits, licensing and planning applications are planned
Licences	to be implemented as part of the CityView project.
Open Data	The City has published a modest collection of open data via its
	ArcGIS open data portal. There is much potential to expand and
	extend the open data being shared with the community.

# Appendix 3: T3 Terms of Reference Sample from City of Whitby

#### Mandate

The Technology Transformation Team (T3) committee is a small, senior leadership group, charged with guiding the large-scale corporate technology strategic direction and investments for projects that exceed \$200K in funding and/or 200 days of internal resource effort. They will also review and provide comment on IT policies and standards. This committee will also receive periodic project status updates from Head of TIS on medium and small technology projects and overall technology challenges.

#### **Duties and Responsibility**

- 1. Reviews and comments on the IT annual work plan and/or significant changes to the work plan throughout the year
- 2. Review of strategic IT Key Performance Indicators (KPI) (financial, resource and infrastructure utilization, standards)
- 3. Completes IT project prioritization evaluation for large scale technology projects
- 4. Arbitrator to resolve IT project prioritization disputes
- 5. Technology policy review and endorsement
- 6. Technical standards review and endorsement
- 7. Reviews and Updates the T3 Terms of Reference once a year
- 8. Reviews and Updates the evaluation criteria for the technology projects prioritization framework once a year (based on a two factors framework Importance and Urgency)

#### Membership

Membership and changes to the membership for the T3 committee will be discussed at the Senior Leadership Team and the final composition will be approved by the CAO.

The Technology Transformation Team committee will be initially comprised of the CAO, Commissioner of Corporate Services and Head of TIS, along with two additional members selected by the CAO.

The CAO will be appointed as the Chair for the T3 committee. After the completion of the initial 2-year term, the T3 Chair will be appointed by the CAO.

#### Terms

The CAO, Commissioner of Corporate Services and Head of TIS will remain on the committee as permanent members. The other three members are on 2 years terms with a limitation that these members cannot serve more than 2 consecutive terms.

#### **Meeting Frequency and Schedule**

T3 will meet a minimum of five times a year. The T3 Chair will determine if any additional meetings are required. Project evaluation meetings will be held in December, March and May. Identification of the approved large-scale technology Decision Items for

the next year's budget will be held in June. Finally, the Governance and Evaluation review meeting will be held in September.

IT Policies and Standards review process can be done either at any of these meetings or can be conducted via electronic means (email) to the T3 committee members).

#### **Quorum and Voting**

A minimum of three committee members will comprise a quorum. The T3 Chair will cast the deciding vote in the event of a tie.

#### Accountability

T3 recommendations will be reported first to Senior Leadership Team and then to all Town Staff. A project plan and status update can be viewed from the Corporate Intranet.

# **Appendix 4: Needs identified by each Branch**

The following provides a list of the technology needs identified by each of the Branches

# Council Input

• Discussions with Mayor and Council largely focused upon their desire to deliver exceptional City services, leveraging the ability of technology to offer high quality customer service experiences (online services, available 24/7, anywhere).

#### **Innovation and Transformation**

- Furthering Smart City (although budget was cut)
- 2021 AAA Accessibility compliance
- Clearer guidance and assistance around using Skype
- Collaboration technology (sharing, collaboration, communication) internally and with partners TeachingCity (what can we learn from TeachingCity)
- Metrics / Monitoring performance dashboards for business operations: real time display boards to show performance
- Security intercom system throughout City buildings
- Oshawa Mobile App
- Forms and Online payments
- Smart Technology = sensors for real time data tracking e.g. how full is garbage can, license plate recognition, smart parking, smart lights to monitor noise, road conditions
- Connected communications display boards for employees e.g. Google Boards
- Exploring use of Automation, Robotics and Artificial Intelligence for Business Operations
- Online learning platform for employees
- Need for a corporate wide data strategy
- Event management and registration system (e.g. Eventbrite)
- Consolidated systems to managed connected display boards across the City
- Improvements to public Wi-Fi
- Council Education / Awareness program around the importance of IT
- Service level dashboards and KPI's
- 24/7 support

#### Planning Services

- Replace range of Access DB's and OLI with CityView
- Encroachments new Access database recently created by Real Estate team (perhaps include in future CityView enhancement/expansion)
- Digital Drawing mark-up
- Simplified large file / document sharing
- Online planning applications and process tracking for public and applicants (inscope for CityView project)
- GIS data and data process review accuracy and completeness to support the CityView project (who is leading this work) - e.g. zoning data is currently updated every 4 months, a more near-real time update will be required for
- Zoning and OP map lookup online
- Expand webstreaming to meetings currently not webstreamed
- Al for booking meetings, sorting inboxes
- Better / consistent meeting room technology smartboards/TV's

#### **Recreation and Culture Services**

- Work/Asset Management system
- Recreation staff scheduling system (scheduling, attendance, trades, payroll, personal information / certifications)
- HR software (track progression, personal information, certifications, training, discipline)
- Wi-Fi enhancements
- TV pads installation at all facilities
- iPad used by front-line staff to manage facilities, programs, admissions
- Security surveillance standardized across all facilities
- People counters to record foot traffic

#### Strategic and Business Services

- Work Management (Maximo)
- Asset Management
- CityView
- Improve employee records management in PeopleSoft
- Move crossing guard payroll into PeopleSoft
- Improved reporting (Vacancy report, Attendance reporting)
- FMW improvements (currently repeating explanations and comments for variances)
- Parking software and equipment
- Traffic Analysis software (TES)
- Incident/Accident reporting (currently in a spreadsheet)
- Lagan  $\rightarrow$  Chameleon integration
- An up to date org chart real time
- Time swipes

#### **Economic Development Services**

- Permitting solution Sidewalk, Filming, Patios, Sandwich board signs (in or out of scope of CityView)
- Cellular connections for mobile working for Ec Dev staff
- Licensing for Adobe Photoshop (1 licence per department) IT's role is to be the gatekeeper to make sure we don't spend too much money on licences
- What's the solution for Microsites (within the City website framework)?
- File sharing and collaboration / large file sharing and transfers
- Oshawa DataHub with accurate data about the City available for staff and public alike (master data sources + census, environics, etc.).
- Outward facing / partnership model for IT (data trusts, innovation, smart city, TeachingCity)

#### **MLEL Services**

- Scheduling solution
- Single online account for users for Service Oshawa, CityView portal
- Plate recognition
- Improved reporting / analytics / BI automated dashboards of calls on the map (PowerBI)
- Regulating the shared economy (e.g. airbnb and uber, amazon delivery drivers) + transition to AMP
- Online appeals for parking tickets which show a picture of the violation taken by officer (this is social engineering / human behaviour)

#### **Engineering Services**

- Asset Management systems scenario planning, capital planning
- Pavement Management System
- Project Management system
- Portfolio Management system(s)
- Transportation Modelling
- Hydraulic Modelling (expand only one licence today)
- Comprehensive approach to data and information management at the City. Currently completely lacking. City misses out by not having a CIO.
- Bridge management system
- LIDAR / drone mapping

#### **Building Permit and Inspection Services**

- CityView
- CityView Mobile
- Model House Plan Access DB → CityView
- Digital plans (BlueBeam)
- Lacking a data quality program we see it in the Data in OLI and in GIS. Worried about the impact on CityView.
- GIS Easements database (not currently available would be useful)
- HR / Lieu Time / Vacation requests make these electronic requests
- Training and support for business solutions from IT

#### **Operations Services**

- Road Patrol solution (how will it integrate with Maximo)
- Mobile for mobile workforce (linked to Maximo)
- Lagan → Maximo integration
- Collector App expansion for inspections and work orders
- GPS/AVL (replace Operasoft) + Telematics vehicle utilization
- Weigh scale not working must be fixed
- Fleet diagnostics solutions
- Online field bookings
- Digitize quality standards / procedures, policies, engineering drawings, all accessible via Intranet

#### **Finance Services**

- Tax replacement
- Work Management implementation
- PeopleSoft Finance; roadmap and work plan
- Tangible Capital Assets (replace Excel)

#### **Facilities Management Services**

- Maximo (to replace various MS Access DB's)
- Project management software (all currently in spreadsheets) including financial tracking, resource leveling, task management and document sharing
- Project portfolio management
- P2P improvements for long-running construction projects support multi-line item projects
- Large file transfer / Collaboration and Document Management
- Construction management software

- Vendor management / contracts management solution
- Real time energy monitoring
- VFA expansion / RS means improvements
- Technical documents (drawings, manuals) and integration with Maximo what is the plan
- Laptops!
- Improved engagement of IT on construction projects (e.g. cameras, cabling, keyscan, etc)

#### **Fire Services**

- BI, analytics and operational dashboards
- Better leverage GIS
- Expand use of Environics
- Better PM support for the next gen 911 system (Regional)
- Maximo (to replace MS Access DB's used to support ops)
- Further evolution of Crisis system
- Better integration of Crisis  $\rightarrow$  PeopleSoft for time and attendance
- LMS for specialized Fire training
- An embedded 'technology specialist' that can admin/support niche fire systems and infrastructure (as well as perform vendor management, support IT PM work and facilitate procurement requests etc.)
- Expanded use of MDTs in fire trucks
- Improved mobility for Fire Prevention officers
- IT service outside of office hours (Fire is 24/7)

#### **City Clerk Services**

- Improvements to Versatile (speed and reliability)
- Dedicated meeting room A/V computers (ISI Live, mic/lighting etc.)
- Agenda Management System
- Better system to support FOI search data (current an MS Access DB)
- Corporate agreements solution/contract management (discovery in progress)
- ERDMS as well the corporate people and processes to support use
- Improved relationship with IT Branch to support large technology projects like IM, internet voting (exploration) and technology support for Council and Committee meetings
- Improvements to PeopleSoft Org Chart Viewer (data maintenance, custodianship)

#### **Legal Services**

- Corporate agreements solution/contract management (discovery in progress)
- Mobility improvements (computers, network access, digital vs. paper based)
- ERDMS as well the corporate people and processes to support use
- IT service outside of office hours

#### **Human Resources**

- Replacement of PeopleSoft HRIM (business case development in progress)
- Time and attendance solution (to replace manual process and MS Access DBs)
- Dedicated HRIM IT specialist embedded in HR
- Corporate IM, data management program + performance management program
- Improvements to IT project management support
- BI, analytics and operation dashboards
- Enhancements to Luceo (applicant tracking) to leverage more native functionality
- Replacement of MS DB used to support internal job evaluations
- LMS + Health and Safety tracking solution (currently Excel)
- Improved relationship with IT to support better collaboration and transparency of projects related information
- Improved communications and IT project management
- Reconstitution of ISSC to play a larger role in support CLT to make strategic technology decisions

#### **Corporate Communications**

- Improvements to ISSC to more formally support "Forms Committee" (web and online)
- Laptops and hardware (offsite connectivity issues, 'mobile selfie station' etc.)
- More technology training for staff (enterprise software)
- Better support (resources and technology) for AODA compliance
- Mobility improvements to Boxer app (stability)
- BI, analytics and operation dashboards
- IT service outside of office hours
- ERDMS (multimedia management images, videos, audio)
- Time and attendance
- Standards for internal surveys and engagement + social media

# **Appendix 5: SCOR Results**

The following section presents the summarized outcomes of the SCOR (Strengths, Challenges Opportunities and Risks) workshop conducted with IT Branch team members.

#### Strengths

- Dark fibre / OPUC partnership
- Largely reliable core infrastructure (notwithstanding current surface/Wi-Fi issues)
- No major security incidents
- Lean, multi-talented IT team
- Good solutions = Lagan, Skype, Follow Me printing, Direct Access
- Good hardware lifecycle program; using a lease program
- Good reactive / helpdesk service strong focus on customer service
- Website / Bang the Table / online service requests

#### Challenges

- Communication and collaboration within IT team 2 groups are like oil and water
- IT Managers focus on doing, more than managing and empowering team members
- Remote access/Wi-Fi is causing some immediate challenges due to poor performance
- Low morale / burn-out in IT team
- Lack of clarity regarding expectations of IT
- Lack of clear strategy
- Constantly changing priorities (when everything is a priority, nothing is)
- ISSC / project list black hole insufficient resources to deliver on demand; ISSC process appears ineffectual at resolving questions of priority
- Lack of IT support out of hours
- Lack of Project Management discipline / resources in IT particularly acute in the Infrastructure/Operations area (Portflio role is helping but taken a long time to get here)
- Key (aging) solutions need to be replaced
- Lack of change control processes within IT and lack of test environments and testing procedures in the Infrastructure domain
- On and off-boarding process (staff change checklist) is ineffective and inefficient
- No IT salesmen / strategic people
- Lack of training role of IT and business not clear; no resources in IT assigned to training per se
- Clearer role definition needed between business units and IT (who has the role to design process, plan and execute change management program, support adoption, deliver training, etc.) what's the business model for IT (centralized vs. hybrid vs. distributed)
- IT needs more people but IT is never allowed to put forward requests for more staff

#### Risks

- Insufficient backup for individuals with specific knowledge and skills in IT numerous single points of failure
- Relying on the goodwill of staff to provide support out of hours unreasonable of the organization to do that
- Burn out and errors resulting from over-work in IT
- Retirements / succession planning major institutional knowledge and work ethic keeping things together all key leaders in IT could retire in short order
- Lack of information management classification

#### **Opportunities**

- Need stronger advocate for IT a bigger voice for IT at the leadership table that can say no; allowing team to focus on key priorities
- We need to create a better working environment within IT where individuals are more empowered to work across the divide between the two teams creating brainstorming and working sessions.
- We need to focus on Architecture, define an architecture roadmap and have a process around Architecture decision making that is not management-centric
- Review policies, procedures
  - Improve / modernize computer use policy
- Set goals and define the metrics that allow us to monitor, demonstrate, manage IT performance
- We need to fix the onboarding process
- Training and mentorship
- Improve / replace ITSM system (Spiceworks)
- Leadership around data

# Appendix 6: Municipal Pressures and Municipal Technology Trends

#### **New Pressures**

In addition to current gaps and opportunities, municipalities must also consider new or emerging factors that will affect future business and IT strategic directions.

**Changing customer and Council expectations:** Customers expect to interact with the municipalities electronically, when they want, where they want, from a variety of devices, instead of coming in to municipal offices. Processes in the back office must be digitized so that they can be offered electronically to customers.

**Changing staff requirements:** Municipal staff require access to the information and systems necessary for them to effectively deliver services. New entrants to the workforce bring with them different expectations. Attracting and retaining new talent is a critical issue facing the public sector – and technology will be an important factor in achieving that. They expect a range of technologies to be readily available to them, on their devices, and not just during standard business hours. They will place new demands on technology and the IT team, and expect their employer to provide flexibility and the necessary tools and solutions.

**Everything is becoming digital:** New technologies are constantly emerging, transforming everyday 'dumb' devices into smart devices that must connect to the network. Today traffic lights and building security controls, garbage trucks and irrigation systems, 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 monitor and manage their operation more effectively and efficiently than in the past. This creates additional demand for the IT Branch to be involved with projects in which they previously may not have been – reinforcing the need for additional IT resourcing.

New technologies are frequently emerging that promise to help staff do their jobs more effectively: Examples include solutions that borrow from consumer technology such as virtual reality headsets that help field workers identify buried assets, or real time glasses-based video streaming that allow building inspectors to seek a second opinion from a colleague. This may sound like sci-fi, but progressive municipalities are using this real technology today. Municipalities with limited resources need to be cautious, identifying and selecting only those initiatives that deliver real value.

**Continuous improvement relies on operating insights:** Digitization of processes means that data is available to provide insights that can enable benchmarking and spark continuous improvement of operations.

#### **Municipal Trends**

We monitor municipal technology trends on an ongoing basis. Based on our research and experience with mid-sized Ontario municipalities we have highlighted trends that we believe should influence the City's technology strategy.

#### Modernizing Infrastructure

The pace at which technology is advancing and new technologies are being introduced is increasing. It is challenging for most organizations to keep up. However, municipalities, like the private sector, are modernizing their approach to technology in various areas:

#### **Device Management**

- BYOD / CYOD: while many municipalities have introduced bring your own device programs for smartphones, a more common model is a choose your own device – where subscribers are asked to pick between a small sub section (usually 3-4 devices) from a vendor list
- Expanded Device choices: municipalities are offering and supporting a broader range of device choices (tablets, laptops, desktops, ruggedized devices) for staff and management to pick from – e.g. iPad, Surface, Surface Book, lightweight laptop, power laptop.
- Move to laptop over desktop: increasingly municipalities are moving toward more flexible working
- Update policies and implement Enterprise Mobility Management solution to simplify the management and control of devices, and to mitigate unauthorized access to data

#### Wi-Fi

- In support of mobile / flexible working ubiquitous staff Wi-Fi in all City facilities allows staff to move between City buildings
- Public access to Wi-Fi is becoming a strong requirement for members of the public – and municipalities are building this access into their digital and digital inclusion strategies, extending municipal Wi-Fi (internet access) to facilities, libraries, civic spaces, parks and open spaces.

#### Infrastructure management

- Most municipalities have achieved around 90% virtualization of their physical server environment
- Some municipalities have been exploring desktop virtualization, as a means of reducing the complexity and costs of managing the device fleet, and to enable remote access and other capabilities. Experience has shown that a) high performance networks are required, and b) this is often not suitable for the complete device environment – typically more appropriate for areas with simpler requirements (e.g. front and back office customer service)
- Converged Infrastructure (cheaper, easier to manage, faster to deploy, more flexible)

- IP everything consolidated networks BAS, Security Systems, Cameras, SCADA, Traffic Signals
- Networks and Connectivity all computing depends on connectivity and bandwidth requirements continue to increase. As collaboration and training becomes more dependent on streamed video, and as virtual reality and real time sensor monitoring becomes a reality – the need fast, reliable, high speed networks will only grow.

# Collaboration

Many municipalities are enhancing their collaboration capabilities, taking advantage of new technologies to help teams work more effectively together. Specific areas of focus for municipalities include the implementation of:

- Modern intranets remotely accessible (by perm and temp staff), with up to date, dynamic content
- Online meetings ability to screen share, video or audio conference
- Instant Messaging ability to check availability of team members, and send short messages in a chat format
- Project collaboration 'spaces' online collaboration spaces replacing the 'shared drive' utilizing file sharing, notes, messages, calendars, tasks lists as a simpler way of keeping projects moving forward
- Internal social networks use of internal social networks to aid collaboration, information sharing and group forming

#### **Cloud Computing**

After a period of uncertainty, municipalities are now beginning to take advantage of cloud computing. Increasingly the market place is shifting to the cloud, to the extent that some vendors no longer offer on-premise solutions. We expect this trend to gain momentum in the coming years.

The "Patriot Act" was a previous concern for many municipalities. In simplistic terms the Act gave the US government the right to access data / information stored in systems based in the US. Many Cloud based systems are delivered from the US, and thus Canadian municipalities were concerned about their ability to safeguard their citizens data that may be stored in the US.

Many providers have established Canadian data centres to address these concerns, however many government organizations have concluded that the concerns are unfounded – recognizing that if the US government wants to access information, reciprocal agreements with the Canadian government and law enforcement would allow them to do so. The provinces and the Federal government are now embracing cloud computing delivered from the US and beyond, and most forward-looking municipal organizations have overcome Patriot Act concerns, and are moving forward more pragmatically.

Many municipalities have developed cloud frameworks, policies or checklists to assist those involved in evaluating cloud-based systems, to ensure that they meet municipal requirements related to data and privacy controls. Evaluations of cloud based services and solutions should ensure that appropriate technical architecture, security & privacy, performance, and cost-benefit analysis.

Among the various types of cloud computing, Software as a Service (SaaS) appears to be dominating uptake in municipalities. Examples include ActiveNet, Salesforce, Website management, Office365.

Infrastructure as a Service has seen slower uptake, but is growing (e.g. Azure). Municipalities are using Disaster Recovery as a Service to deliver DR services without significant capital outlay.

Integration becomes more important as solutions and technologies move to the cloud, so cloud-based integration capabilities (e.g. BizTalk, Mulesoft, Zapier, FME) are being utilized by municipalities to bridge the cloud and on premise environments.

Adopting cloud computing is a significant mindset shift for IT and business unit staff. Skills required in both IT and business areas may be different (e.g. IT system admin requirements change, the importance of contract and SLA management increases), and functional responsibilities that may previously have been with IT may be re-distributed to the business. It is important in making these transitions, that they be planned, and roles and responsibilities appropriately allocated.

# **Cyber Security**

Recent news events, the frequency of cyber-attacks on government and municipal institutions, and the growing availability of cyber insurance are all contributing to a greater awareness of security risks among municipalities.

Larger municipal organizations are undoubtedly committing more resources and attention to cyber security. They are doing this by elevating the profile of security from a purely IT issue to one of risk management worthy of Senior management attention. and involving the establishment of corporate security programs and standards, revised corporate policies, regular security testing, and ongoing monitoring programs.

#### Mobile and Flexible Working

There are three primary areas flexible / mobile working:

- <u>Knowledge working</u>: ensuring that mobile office workers have the technology to work at any City facility with full access to all computing resources (e.g. HR analysts, health and safety staff, Managers and Directors that spend a portion of their time in meetings)
- <u>Remote working</u>: ensuring that staff out of municipal facilities can access the computing resources they require. This may include permanent work-from-home staff, staff that do some work in the evenings, staff that may work from a coffee shop, staff that may work from other client offices (e.g. economic development staff)

 <u>Field working</u>: ensuring that staff who work out of the office (e.g. snow plow operators, supervisors, road patrols, parks maintenance crews) have access to technology that connects them to customer service and back office systems to look up information (maps, drawings, service history) and/or update information (work orders, time and labour, inventory use)

Although many municipalities may have a "work from home" or teleworking policy, adoption often varies and most municipalities in Ontario have not aggressively pushed flexible working. In other countries (e.g. UK) this has been much more aggressively pursued – resulting in significant reductions in accommodation costs.

#### **Applications and Applications Management**

Municipal IT organizations are gradually focusing more attention and staff resources on business systems, and on helping departments to effectively implement and utilize cross-cutting business system platforms.

Most municipalities have moved away from development of custom solutions toward a buy vs. build strategy, preferring to purchase and configure commercial, off-the-shelf solutions.

Increasingly, municipalities strive to standardize business processes – and re-use outof-the-box processes, as opposed to designing systems around proprietary, in-house business processes.

Most municipalities (and businesses beyond the public sector) pursue a rationalized business systems platform approach – using a small number of core systems, and reusing those systems as much as possible. Re-use before buy is another common application philosophy, where departments are encouraged to utilize an existing solution in the application portfolio before purchasing a new system. The intent is to reduce the cost, complexity and learning for staff associated with using and maintaining many disparate systems.

While larger municipalities have pursued integration hub / ESB strategies for some time, mid-sized municipalities have typically built point-to-point systems integration.

With increasing complexity of integration needs and the need to integrate cloud and onpremise solutions, mid-sized municipalities are beginning to utilize a range of integration tools and strategies. Modern integration solutions are less complex (and use less of a monolithic ESB approach) than using a range of integration solutions that are best suited to the task.

# **Open Government**

Municipalities across the globe have embraced open government to reinforce transparency, but also to open up new ways to engage the community, to stimulate technology activity in the community, to engage the community more effectively. Areas include:

- <u>eAgenda Management / Archives</u>: most municipalities have long offered comprehensive, searchable archives of their agenda's and minutes
- <u>Audio and video streaming Council</u>: most municipalities offer council audio or video streaming. Increasingly municipalities are extending this to committee meetings. There is growing interest in using similar technology to extend the reach of planning City halls and open houses, and to allow for digital delegations at Council.
- <u>Online engagement and participation</u>: more progressive municipalities are going beyond surveys as a means of engagement – using digital engagement techniques such as online consultation, ideation (citizen idea generation and voting), e-Petitions, and citizen panels to enhance engagement. Some have used public commenting or collaboration on strategy and policy documents
- <u>Open Data</u>: open data has become a proven method by which municipalities distribute information to the community and stimulate interesting uses of the data. This is now commonplace in large and small municipalities in Ontario and a set of standards can be adopted to speed the implementation.
- <u>Public Performance management</u>: larger municipalities, with strong political leadership, have adopted a public performance-reporting model that shares specific performance metrics with the community. Edmonton's is one example that builds a performance dashboard from their open data program.
- <u>Open by Default</u>: finally, the most progressive organizations are targeting a broad "default to open", a proactive disclosure approach, that publishes information and the data behind decision making, by default. Examples include the City of Montreal that publishes detailed financial information (e.g. GL / journal entries), contract awards information – all in query-able formats to allow citizens or journalists to review the City's activities.

#### **Data & Analytics**

Municipalities such as New York and San Francisco, and increasingly municipalities in Canada such as York Region and Burlington, have embraced deep data analytics and performance management to address challenging and persistent municipal problems. Common work in this area for municipalities includes:

# Data Architecture

- <u>Data Architect</u>: several mid-sized municipalities (Vaughan, Oakville) have appointed Data Architects to lead the development of master data programs, data standardization activities.
- <u>Master Data Management</u>: mid-sized and larger municipalities are pursuing master data management strategies specifically with a focus around place (location, address, parcel), people (customer, employee), asset (common

referencing schemes), financial (GL codes) – that are designed to reduce data duplication and simplify data integration and analysis. This involves establishing data standards, roles and responsibilities, update processes and processes for keeping data up to date.

• Data / privacy policy: municipalities are beginning to set policy around the data it collects, what can be done with it, and how it can be used.

# Analytics / Business Intelligence / Reporting

- Several mid-sized municipalities are pursuing large scale business intelligence projects.
- But the majority are taking a more piecemeal, low key approach that involves a lightweight mix of products and tools. Qlickview / Tableau are commonly used.
- Several mid-sized municipalities are staffing around analytics teams. In some cases these teams are growing out of the GIS organization.

# **Digital and Smart City**

Digital and Smart City strategies are about turning the focus of technology towards the community (how to deliver value to the community, and how to harness the community). It is about facilitating the growth of the digital economy. It's about applying the techniques of the internet age (web centric, user focused, A/B testing, agile and iterative, data analytics), and applying these techniques widely used by Silicon Valley and successful web companies to the municipal sector. Depending on who you talk to, Smart City may be more about IoT (e.g. smart water meters, traffic signals, traffic and pedestrian monitoring, smart garbage collection, etc.). It's using sensors and connected technologies to make municipal operations smart.

So, some initiatives or areas of focus include:

- <u>Online services</u>: expanding the range of services that are offered online. It also means developing those services in partnership with the community. Using the approaches and principles deployed by large web firms designing processes end-to-end, involving the community to create customer-centric design, A/B testing, iterative development cycles that include alpha and beta releases of the software to gain user input.
- <u>Community involvement</u>: harnessing the community to help solve municipal challenges (e.g. Civic accelerator (Guelph), hackathons, ideation)
- <u>Stimulating the local technology economy</u>: working with the community to help facilitate a flourishing local technology economy (labs, accelerators, gigabit broadband investment)
- <u>Smart city</u>: embracing sensors and technologies that enable the City to be more effectively and efficiently run
- <u>Digital inclusion</u>: addressing the digital divide, ensuring that no-one in the community is left behind in the opportunity to utilize digital
- <u>Civic CIO</u>: this type of approach typically sees a transition of the CIO from an inward focus to an outward focus. The CIO engages with the community, works across organizational boundaries, thinks out-of-the box to help solve municipal challenges.

### New and Emerging Tech

A range of new and emerging technologies are being embraced by municipalities.

- Drones: drones are proving to be useful in a variety of situations (fire and emergency management, asset inspections, event management). However, municipalities must be aware of PR concerns, policy and liability issues, as well as the need to store the large volumes of data generated.
- Sensors: municipalities have long used a range of sensors, but there is an increase in use in smart city technology in several areas:
  - Compliance: Automated Vehicle Location tracking, garbage collection (cameras to confirm collection)
  - On demand service delivery: weather sensors, garbage collection, irrigation systems that run when moisture levels reach a certain level
  - Informed planning: pedestrian, traffic counting,
- Wearable technology, A/R and V/R: not yet mainsteam, but potentially this will have a significant impact in fire and life safety, in project planning, in capital works and field worker training.
- Marc Andreessen (co-founder of Netscape) said that "software eats hardware", meaning that dedicated hardware will be eventually be replaced by software. Municipalities should be aware that currently hardware-driven functions, such as traffic counting, may well be replaced by software solutions in future.