CITY OF Thunder Bay
Superior by Nature

Corporate Digital Strategy

A Collaborative Approach to Delivering Customer-Centred, Digitally-Powered City Services

Final Report

October 25, 2021

Perry Group Consulting Ltd.

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Version Control

Table 1: Version Control

Version	Prepared By	For	Date	Comments
0.1	Ben Perry	Internal	2021-09-22	First early draft
0.2	Ben Perry	EMT	2021-10-04	First draft for EMT
0.3	Ben Perry	EMT	2021-10-25	Incorporates EMT feedback
1.0	Ben Perry	Council	2021-11-04	Incorporates further EMT feedback

Key Terms and Terminology

We have worked hard to prepare this document using easy-to-understand language. Nonetheless, the meanings of some frequently used terms should be clarified before we start.

Table 2: Key Terms and Terminology

Customer	This term has been used throughout this document as a shorthand to refer to users of the City's technology and digital services which includes residents, businesses, visitors, Mayor and Council, the workforce, and partners.
Experience	Refers to the overall experience of a person using a City service, especially in terms of how easy or pleasing it is to use.
Digital	Refers to a mode of operating and delivering City services in a way that takes full advantage of streamlined processes and modern technologies (web, app, social, mobile, data) to deliver improved experiences, business efficiencies and insights.
Digital First	Refers to designing City services for digital and online service channels *before* counter, phone, or mail-based channels. For example, designing a new service to use a web form and online payment, not a paper form and a need to visit City Hall to pay.
Digitization	The automation of manual and paper-based processes, enabled by the digitization of information, workflows, moving from an analog process to a computerized process.
CIT	Corporate Information Technology – the City of Thunder Bay's IT Division.

Included in Appendix A, Glossary Of Terms is a complete list acronyms used throughout this document.

Executive Summary

The Digital Context and Opportunity

In 2021, over 94% of Canadians are on the internet, 88% of Canadians bank online, 71% of seniors are online, and in 2019 – pre-pandemic – 72% of Canadians had accessed a government program or service online in the previous 12 months.

For many, technology has become an essential way of getting things done – relying on their smartphone or laptop to book appointments or a trip, to make an insurance claim, to bank, shop, navigate, or connect with friends.

Increasingly, people want to interact with their government service providers in the same way that they make purchases or deal with their bank. In 2019, 68% of Canadians indicated a preference to access government services online. Think about your own recent interactions with ServiceOntario to renew a driving license or submit your tax return to the CRA and how much easier these processes are now that you can do them online.

In Thunder Bay, some positive progress is being made in the right direction – a new website, get involved Thunder Bay, online program registration, and open data have all been recently introduced. And these new services have seen high rates of uptake – with 80% of customers getting burn permits online, and over 70% of recent recreation program registrations happening online. These are strong signals from the community of a desire to interact with the City online. As part of the development of this Strategy, consultation with the community, the Thunder Bay Chamber of Commerce, and representatives from industry, strongly reinforced the message that demand is high for online services.

Today, technology underpins many of the critical things that the City does – from bus route planning and making sure buses are on time, to treating and delivering clean water, to dispatching fire trucks and medical record management at Pioneer Ridge, to tracking and dealing with problems in the roadway.

But there are many areas where paper-based processes continue to be used, and few City services are available in the ways that many of the City's customers would like to interact with them – online.

The Program and Service Review (PSR) highlighted various opportunities to leverage technology and recommended the development of this Digital Strategy. The City was successful in seeking provincial support and funding for the project through the Audit and Accountability Fund.

Perry Group Consulting, a specialist in municipal technology and digital strategic planning, was hired in April 2021 via an RFP process to facilitate the development of this Strategy.

Current State

Following broad consultation with Council, community and staff at the City, the consulting team's current state assessment confirmed many of the PSR's observations and identified a set of key opportunities for improvement.

The City appears to be behind peers – such as Cambridge, Kingston, Guelph, Milton, Waterloo, Chatham-Kent, Newmarket, and Red Deer, and leaders in technology such as Oakville, Burlington, Kitchener, Richmond Hill, Markham, and Calgary – in taking advantage of technology and digital capabilities to deliver efficient and effective City services. There is some significant catch up required.

Major systems that the City has invested in, such as SAP, AMANDA and Hansen (which are, in many ways, market leading solutions used widely by many other municipalities in Canada) are under-utilized, and core processes that run the City are not yet digitized.

There are numerous opportunities to deliver new services online to customers – billing and account management for water and tax, payments, bookings, forms, permits and licenses, report a problem, make a request, as well as marina and campgrounds booking and self-service.

The operating model for IT at the City (how technology is designed, delivered, and managed) is somewhat unclear and undefined – a finding also identified in the Program and Service Review. This contributes to a complex and siloed environment where various teams are pulling in different directions.

There is a lack of formalized technology governance, which means that the City’s technology investments and program delivery lack the coordination necessary to be as effective as possible, and to optimize the use of funds and efforts.

The City does not have an effective “engine of project delivery” – a shared and consistent methodology and a dedicated team of staff who are skilled at repeatedly and successfully delivering technology initiatives. This results in too many long-running technology projects that don’t always achieve the expected outcomes. This is a core competency that the City will need for technology projects ahead.

Also, the City needs to do a better job of evaluating solutions for “fit” with the City’s existing technology estate – this is the role of IT architecture – to which the City currently has no resources assigned.

When benchmarked against other Ontario municipalities, Thunder Bay’s investment in IT staff is significantly lower than comparable peers, and the consulting team noted that the City’s CIT team in 2021 is the same size as it was in 2001. In those 20 years, the importance and impact of IT on the organization has been transformed.

The assessment of the City’s digital maturity scores the City at only 2 out of 5 for its digital maturity, although the City shows some characteristics of a Digital Resister which would rate the City at a Level 1 – illustrating there is much ground to make up to become a more digital organization.

The consulting team notes that there are opportunities in every part of the organization to apply process design and automation to improve the efficiency of service delivery, to increase productivity, and to improve the customer experience.

The Vision

Looking to the future, the Digital Strategy sets a vision for digitally-enabled City services. The Vision for the Digital Strategy is articulated in the following statement:

A collaborative approach to delivering customer-centred, digitally-powered City services.

The Strategy recommends that the City begin to take a Digital First approach to service delivery, working on designing all new services – and re-designing existing services – to be delivered digitally.

Rather than from the City's perspective, services should be designed from the customer's perspective and around their needs, making the service easy to interact with.

The Strategy makes the case for the importance of collaboration and recommends a new governance model and the use of multi-disciplinary teams to bring the right perspectives and approach to digital implementation.

While the Strategy promotes digital service offerings, the City must also recognize that many customers, for various reasons, will not want to (or will not be able to) use online services. These customers will prefer to talk to staff directly on the phone or face-to-face.

This Digital Strategy does *not* recommend digital-only services. All services should continue to be offered to customers across all channels and in the ways that customers want to interact with the City.

Major Areas of Focus

The Strategy identifies five work streams for the City to focus on. They include:

1. **Digital Workplace** – Connecting all staff; using technology to make staff working lives simpler and easier.
2. **Digitized Business Processes** – Replacing paper-based, manual processes with automated, digital, real-time workflow-based processes.
3. **Digital Infrastructure** – Ensuring the City has the connectivity, Cloud capabilities and cybersecurity to support the City and its community.
4. **GIS Data & Analytics** – Managing data well and using it to drive City practices and decision-making.
5. **Digital Services** – Providing great, self-serve digital experiences to customers over visits or calls to City Hall.

In support of these work streams are a set of major projects, including:

- Implementation of Microsoft 365, a modernized collaboration environment for staff and for working with partners.
- An Information and Records Management Strategy and new systems to support improved access to and sharing of information.
- Increased support for mobile working and flexible working (including new device types, expanded hours of IT support).
- A revamp of the City's Asset Management systems.
- SAP upgrades and implementation of Finance improvements to enable self-service and reduction of administrative tasks.
- Implementation of a comprehensive HR Management System.
- Water and Tax Billing System replacements, including an online customer portal.
- Network improvements and long-term strategy to support Internet of Things (IoT) and Smart City.
- Public Wi-Fi expansion.
- An expanded cybersecurity program.
- GIS upgrades and expanded self-service GIS capabilities for customers and staff.
- Data strategy, platform and new reporting and analytics.
- Major expansion of online payment options.
- Forms digitization program – converting PDF and Word forms into online fillable forms available from any device, that enable digital processing, approvals and signatures and payments.
- Implementation of online building permitting and planning services, including providing mobile technology for inspectors.
- Expansion of online bookings and account management for recreation programs, facility booking, marina and campground services.

Strategic Plan Support

The work identified in this Strategy directly supports the pillars of the City's Strategic Plan in the following ways.

Table 3: Pillars of the City's Strategic Plan

Lead	Serve
• Expanded regional / cross-sector partnerships. • Data, analytics, and community insights. • Expanded public Wi-Fi.	• New digital services, including billing, payments, book, apply, request. • Customer Relationship Management (CRM) Strategy.
Grow	**Renew**
• AMANDA roadmap. • Building and planning enhancements. • Mobile inspections. • Online planning and permitting applications.	• Asset Management systems. • GIS expansion and integration. • Mobile technology. • Project and portfolio management solutions.

Key Recommendations

In addition to the recommended workstreams and key projects, the Strategy makes the following recommendations:

1. Adopt and communicate corporate-wide a clear strategic intent and vision for digital service delivery as the City's primary platform for customer service – a collaborative approach to delivering customer-centred, digitally-powered City services.
2. Ensure that all service owners commit to moving toward Digital First service as a priority through the signing of the Digital Declaration.
3. Set up and operate the recommended Information, Digital and Technology Governance model to help keep the organization focused on strategic priorities, to enable shared learning, and collaborative working on the technology and digital portfolio. This includes:
    a. Establishing a corporate Information, Digital and Technology Governance team, to be led by Executive Management Team (EMT) and CIT Management, to ensure sufficient time and attention can be paid by leadership to strategic technology and digital opportunities.
    b. Establishing Director- and Management-level coordinating groups as the forum for collaboration in key areas of Strategy focus – work and assets, land and property, customer service and digital, GIS and data.

c. Establishing a singular intake process for all technology initiatives that applies suitable levels of rigor, ROI assessments and architecture to ideas, concepts and project proposals.

d. Conduct an IT policies review and expand the City's IT policy framework to address important areas.

4. Set up and operate the proposed IT and digital operating model to support the delivery of this Strategy and new digitally-powered services. This includes:

   a. Elevating the CIT function and pursuing a more centralized approach to core technology staffing.

   b. Formalizing a revised mandate for CIT along with clearly defining roles and responsibilities between CIT and departmental staff (as recommended in this Strategy).

   c. Reviewing and elevating CIT Manager and Supervisor roles in line with the City's guidelines for Organizational Job Level Titles.

   d. Increasing investment in IT staffing, with recommendations to add the following positions in a phased approach over the next 4 years:

      - Manager, Delivery
      - GIS and Data Coordinator
      - Project Manager / Business Analyst x 3
      - Application Developer / Analyst x 2
      - Data Engineer

   e. Working on building stronger IT / business unit relationships through a new CIT-operated relationship management function.

   f. Adopting a consistent project management methodology and improving project delivery capabilities and project outcomes.

   g. Increasing focus on architecture.

   h. Pursuing alternate resourcing strategies (including capitally-funded staffing, using rosters and increasing use of out-tasking) to add additional capacity to CIT to support the delivery of digital solutions.

5. Reviewing IT funding and increasing IT investment.

   a. Reviewing the current approach to IT investment and determining a suitable go-forward model that provides the insights and controls necessary over the City's total technology spend.

   b. Funding projects for 2022 through the 2022 proposed budget commitments, and subsequently submitting 2023 budget requests and so on, to support implementation of the next stages of the Strategy.

c. Establishing new sources of funding to support increased technology investment, targeting a 3% investment level (capital and operating) at minimum.

d. Capitally-funding staffing and backfill (in business units and CIT) for technology projects.

e. Beginning to prepare for capital to operating transition associated with a move to subscription and Cloud services.

6. Investing in digital change management, education, and culture change through showcasing successes, bringing in external speakers, building Communities of Practice.

7. Measuring and reporting on digital performance and successes.

   a. Establishing a Digital Strategy performance dashboard, reporting on key metrics defined in this Strategy.

   b. Providing an annual report to Council and EMT on progress against the Digital Strategy.

Implementation Staging

Undoubtedly, there is significant work ahead for the City which can be intimidating. Breaking the work into bite size chunks is important. As such, the Strategy recommends a phased-in approach to implementation.

The first task is to set the conditions for success – by building the governance model, re-setting the operating model and aligning the organizational model appropriately.

Next, the City must focus on fully digitizing its core processes (people and money, work and assets, land and property). This means a focus on business process re-design, business solutions implementations, and the expansion of mobile technology use to field and mobile staff.

The third act is building on these foundations to begin to move City services online such as building and planning services.

Funding the Strategy

The City has established a Digital Strategy Implementation Fund for 2022 and going forward in 2023 it is recommended that a Digital Strategy Fund be established to support the implementation of the Strategy. Funding needs for some of the items identified in this Strategy have already been identified in the long-term capital plan.

The proposed 2022 Digital Strategy Implementation Budget and other sources cover the projects identified for 2022 in this Strategy.

Additional staff recommended in this Strategy have also been included in the proposed 2022 budget.

Future requests for funding to support the implementation of this Strategy will come forward as part of the standard budget process.

Conclusion

While these recommendations undoubtedly require significant investment, effort, and attention, this Strategy is crucial to the long-term effectiveness of the City and should be acted upon.

To capitalize on technology opportunities is a classic invest-to-save situation. Up-front investment results in long-term gains. The returns on investment are there and can be realized with the right approach.

Not acting on the recommendations contained within this Strategy will mean that the City misses out on opportunities to drive efficiencies throughout the organization, to increase staff productivity, and to gain insights into service delivery that will pinpoint areas for improvement.

Perhaps more importantly, the City will be poorly positioned and likely fail to meet ever-growing customer expectations of high-quality service.

To be a digital organization – one that operates effectively in the era of internet and smartphone – is increasingly becoming a core municipal competency.

Municipalities – large and small across the globe – are embracing technology as a way of doing more with less, of operating efficiently and achieving improved outcomes for their communities.

This Strategy positions the City of Thunder Bay to do the same and achieve the same benefits.

1.0 Introduction and Background

1.1 The Context

In the always-on, fast moving, 21st century world, digital technology has become a powerful force in society. Using their smartphones or tablets, many people choose to bank and shop, buy and book, get their entertainment, navigate, connect, and communicate online in ways that fit better into their busy lives than previous ways of getting service did.

Federal, provincial, and municipal governments across the country have recognized these trends and are embracing these concepts and ideas too – implementing new capabilities to deliver digital government services to their customers. Just think about your own experiences with online health card renewals, getting a fishing license, or purchasing your vehicle sticker.

This Strategy was developed in this context, as well as in the shadow of the COVID-19 pandemic. The pandemic experience has been instructive, showing just how willing customers are to interact with the City digitally and helping City leaders and staff learn how fast they can pivot to work from home, introduce digital approvals, and reconfigure services to be more digital.

While the 2019 Grant Thornton Program and Services Review was the impetus to initiate this work, it is in this broader context that the development of this Digital Strategy was identified as a Council priority.

1.2 The Importance of Technology for Municipalities

Today, most municipalities – Thunder Bay notwithstanding – are massively dependent upon technology to operate. In fact, you might be surprised by how much technology runs the City.

Services as diverse as tax billing, dispatching fire trucks and ambulances, coordinating transit services, managing traffic flows, safely treating water, handling customer enquiries, and managing recreation program registration, all rely on information technology working quietly in the background to operate effectively and safely.

While email, messaging and smartphones keep every part of the organization connected, communicating, and collaborating, it is the back-office business solutions that manage the flow of work – allowing managers and staff to track development applications, run payroll, collect taxes, manage customer requests, or monitor budgets. It is this digitized core or digitized platform that makes the City work and work efficiently.

The diagram below is an illustration of how the crux of common systems feeds a multitude of areas – internal and external to the City – such as, back-office staff, customer service agents, field staff, Council and management as well as online customers, face-to-face customers, phone customers and app/social media customers.

Figure 1: Common Systems Making Connections

Using common, integrated systems ensures that inquiries flow from front counters to the back-office and to appropriate field staff for resolution. This increases the potential to deliver expected results consistently and reliably at reasonable cost.

Without technology, most municipalities simply could not operate, even for short periods.

Beyond back-office systems, municipalities are increasingly employing what are referred to as “Smart City technologies” and more connected City-wide sensors are being used to monitor critical infrastructure (e.g., detect water leaks, highlight congestion, or report a full garbage can) and alert staff to where problems are anticipated or have occurred.

Data and information is expected to become increasingly more important, providing insights about service delivery that allow City officials to improve efficiency and improve services. Predictive analytics will likely help municipalities work smarter and more efficiently.

So, though often invisible to citizens, technology is a critical service – the glue if you will – that keeps the City running 24/7.

1.3 The Importance of this Digital Strategy

The Program and Service Review noted that *"The City should develop a comprehensive Digital Strategy that is connected to the overall City Strategic Plan and its objectives."*

Given the importance of technology and its role in delivering City services – and particularly given the many competing demands of the municipal setting – a Digital Strategy is crucial. It should address questions that are fundamental to the City's future success, such as:

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

Critically, a Digital Strategy allows the City to determine its strategic technology priorities and then set out the initiatives and activities that will be critical to supporting the City's strategic business goals and objectives, and what supports will be needed to deliver on the priorities.

1.4 Developing this Strategy

Council and the EMT identified the need for a Digital Strategy as an outcome of the Grant Thornton Program and Service Review.

The City sought funding from the Province through its Audit and Accountability Fund (AAF), and selected Perry Group Consulting Ltd. (a specialist in municipal technology and Digital Strategy) as a third-party reviewer to facilitate the development of the Strategy via a formal RFP process.

From the outset, the development of this Strategy was approached as an enterprise initiative, not a Corporate Information Technology (CIT) division project.

The EMT – with the Manager of CIT– operated as a Digital Strategy Steering Committee. The consulting team reported to the Steering Committee and the group met nine times to review findings and provide input and direction.

The General Manager (GM) of Corporate Services and Long-Term Care sponsored the project which the Manager of CIT led.

Additionally, IT and business unit staff were engaged for awareness and input throughout the project. These groups participated in a series of workshops and meetings to shape the Strategy and contributed to the Vision and principles. Perry Group facilitated these sessions and the creation of this Strategy.

The project was tackled in four phases.

1.4.1 Kick-Off and Engagement Planning

We conducted a series of kick-off workshops with City Council, Leadership and staff to initiate the project and plan the engagement approach.

1.4.2 Digital Maturity Assessment

A current state assessment was conducted by the consulting team which involved input from all staff via survey, assessments of Thunder Bay technologies and practices against municipal standards, workshops with all IT staff, as well as meetings with CIT Management, all divisions and members of the Executive Leadership team.

The consulting team met with members of Council as well as with the Accessibility and Community Communications Committees. Meetings were also held with partners, including Tbaytel, Police, Library, CEDC and various other community partners. A focus group with representatives from the development and building community was also held.

At the conclusion of this phase, an interim Findings Report was compiled and reviewed with the CIT Management Team, CIT Staff, the Digital Strategy Project Team, and EMT through the Digital Strategy Steering Committee.

1.4.3 1.4.3 Strategy Definition

During the strategize phase, a series of meetings, workshops and roundtables were held with CIT Management, the Digital Strategy Project Team and EMT to set future-looking strategies, develop the Vision, define principles to guide future decisions, determine priorities and set the future operating model.

1.4.4 Digital Strategic Plan

The consulting team worked with the IT Manager, City Manager, GM of Corporate Services and Long-Term Care and the Steering Committee to develop a series of recommendations, an implementation plan and to prepare this final written Strategy, drafts of which were reviewed by the CIT Management Team, Digital Strategy Project Team, EMT and IT staff before being finalized.

A list of participants who contributed to the development of the Digital Strategy is included in Appendix B, Strategy Development Participants.

We thank all those who participated in the process of developing a Strategy that we believe positions the City well for a more digitally-enabled future.

2.0 Current State

All good strategy starts with a good understanding of where you currently stand. It is important to understand the current state before determining where you want to go, to identify gaps, and to help determine what it will take to achieve the desired future state.

In the second phase of the project, the consulting team conducted a detailed assessment of the current technology and digital environment and the management of these environments. Findings were compiled and then shared and validated by City staff and management.

What follows is a summary of the consulting teams' key observations and findings.

2.1 Introducing the Municipal Technology Model

Perry Group's standardized Municipal Technology Model (MTM), shown below, was the basis for evaluating the City's technology architecture environment.

The diagram shows four interconnected layers. Each entity noted within a layer relies on the other layers for staff to deliver services to internal and external clients.

Each layer is described in detail below.

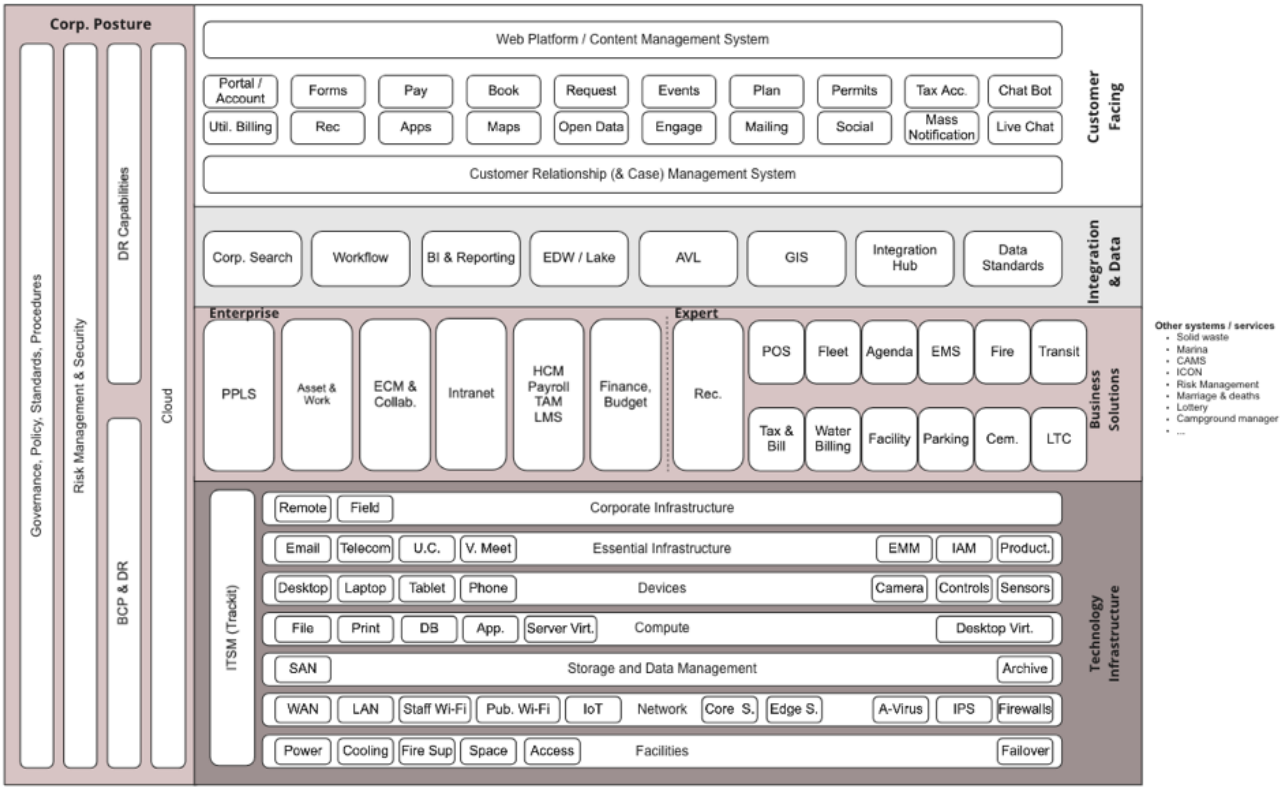

Figure 2: Municipal Technology Model

This is a generalized, conceptual municipal IT model, developed with Canadian municipalities over the last 10 years. The MTM introduces several key concepts that are important for the City at this time, including:

- There are four main technology layers (labeled 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. An organization needs a breadth of 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, high-performing and dependable 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 also 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.
- Online, customer-facing services should connect / integrate into back-office business solutions, reducing the requirement to re-key information and enabling complete end-to-end digital services.
- The IT architecture should ***build from the bottom up*** – Infrastructure first, then Business Solutions and so on.

These are some of the basic tenets under which a well-architected technology environment will operate.

2.2 Municipal Technology Model Assessment Results

The figure below illustrates the results of the consultant's assessment of Thunder Bay's technology environment against the MTM.

The traffic light colour coding highlights where the City is in good shape (green) and where work is needed (yellow=some work needed; orange=major work needed; red=risk/replace and clear/white=gap).

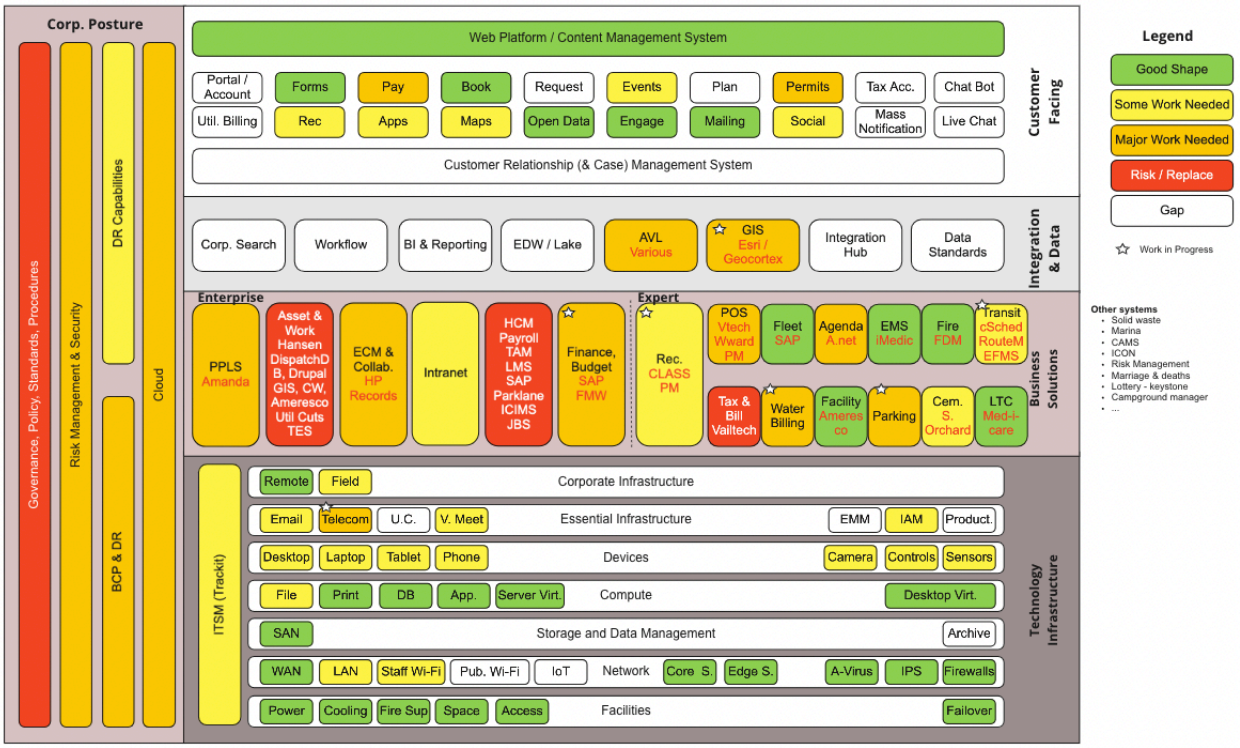

Figure 3: Thunder Bay MTM Assessment Results

The summary of the observations related to the technology environment is presented in the table below and a grade rating (A, B, C, D, U) is offered to summarize the resulting assessment where A=Good, B=Improve, C=Weak, D=Risk, U is unclassified.

Table 4: Summary of Technology Environment Observations

Good	Improve	Weak	Risk

Layer	Comments	Grade
Customer Facing	• Decent web platform – eSolutions + forms • Few web / digital services – strong customer demand for digital services • No CRM and no unified customer service strategy	C-
Integration	• Limited work in this space currently • Some pockets of GIS work – but lacking coordination; GIS Strategy identifies some major work ahead & importance of GIS leadership • Lots of opportunities – but no resources or attention directed to this domain – who is leading?	U
Business Solutions	• Significant underutilization of major systems – SAP, Hansen, AMANDA • Many business processes are paper driven with post-facto tracking • Lack of strategic direction on key platforms – fracturing / local direction being set • Complex / partnerships / relationships – CIT un-involved in many systems decisions	D
Infrastructure	• CIT domain • Reasonably stable, reliable, infrastructure in decent shape • Network connectivity needs some attention / investment • M365, clarify cloud posture, improve BCP and policy positions, address data lifecycle management	B

While there are several things to address to improve the Infrastructure Layer – not the least of which is network connectivity and network performance – broadly speaking, the core technical infrastructure is in decent shape. Work will be needed in areas such as policy, Cloud Strategy, Governance as well as business continuity, disaster recovery and security.

However, the key message for the City that the assessment reveals is that the City is under-utilizing and under-performing with regard to its business solutions. This is the area on which the City must focus in the coming years – to bring its core processes and core systems up to a reasonable level.

Major systems that the City has invested in – such as SAP, AMANDA and Infor, which are, in many ways, market leading solutions used widely by many other municipalities in Canada – are under-utilized and core back-end processes that run the City are not digitized. Too many of the City's most important processes run in multiple parallel systems or are managed in Excel worksheets.

The next layer – Integration and Data – is very under-developed at this time. This is unsurprising given the situation in the Business Solutions layer.

GIS is the area on which to focus in the short-term because of its importance as a core platform to asset management, and land and property-based processes. In the longer-term, a focus on broader data strategy, analytics and business intelligence is required.

Finally, there are numerous opportunities to deliver new services online to customers – billing and account management for water and tax, payments, bookings,

forms, permits and licenses, report a problem, make a request, as well as marina and campgrounds booking and self-service.

The evidence from our consultation with the community and uptake of newly introduced digital services – for instance, 80% of all burn permits and over 70% of recent recreation registrations are done online – suggests that demand is there for services to be delivered online. But the City must establish its digitized foundations in the Business Solutions Layer before significant progress on digital service delivery can be made.

Following the *build from the bottom up* approach, the City's focus should be on its core business solutions and ensuring its core processes – people and money, land and property, asset and work, and information management – are well managed and fully digitized from end-to-end.

2.3 High-Level Summary of the IT and Digital Management State

As part of the consulting team assessment, we also reviewed the way the organization approaches information, technology, and digital management.

While there are various positives – including a capable team in CIT, some good progress on the City's website, the recent launch of online recreation services, work underway to replace the City's water billing system with a modern portal-based solution – some important issues were identified and are discussed here.

2.3.1 IT Operating Model

We note that the City's IT operating model (how technology is designed, delivered and managed) is somewhat unclear and undefined – a finding also identified in the Program and Service Review.

The role of CIT, as illustrated below, is unclear and interpreted in different ways by different parts of the organization. Some see CIT as a "Utility provider", while others expect CIT to be a "Partner player".

If a "Partner player", CIT would be integral to how the organization does business, to closely partner with business units to help them identify, plan and deliver transformation initiatives. Some, at Thunder Bay, see CIT here.

Contradictorily, however, some see CIT as a “Solid utility” meaning that CIT is expected only to provide cost-effective reliability to the business units.

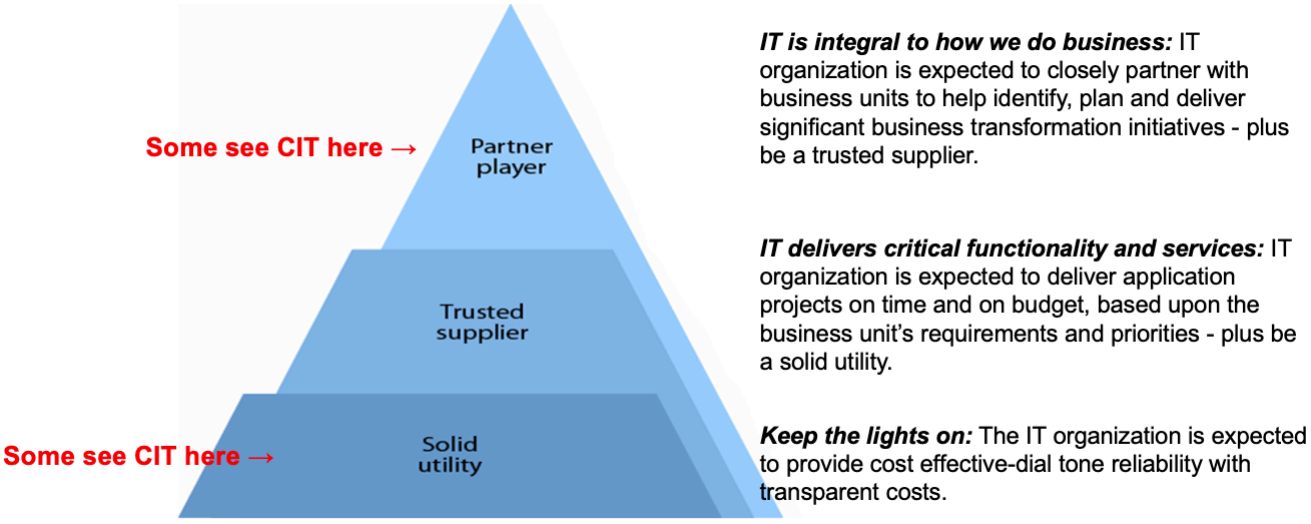

Figure 4: Diagram Illustrating Confusion Over the Role of CIT

Without a formally agreed model in place, an ad hoc and variable approach that is open to interpretation by each team, division and department has been established. This contributes to a complex and somewhat siloed environment where various teams are pulling in different directions.

In some situations, this means that some departments choose not to work with the CIT Division on technology initiatives and projects while, in other situations, the business units do work closely.

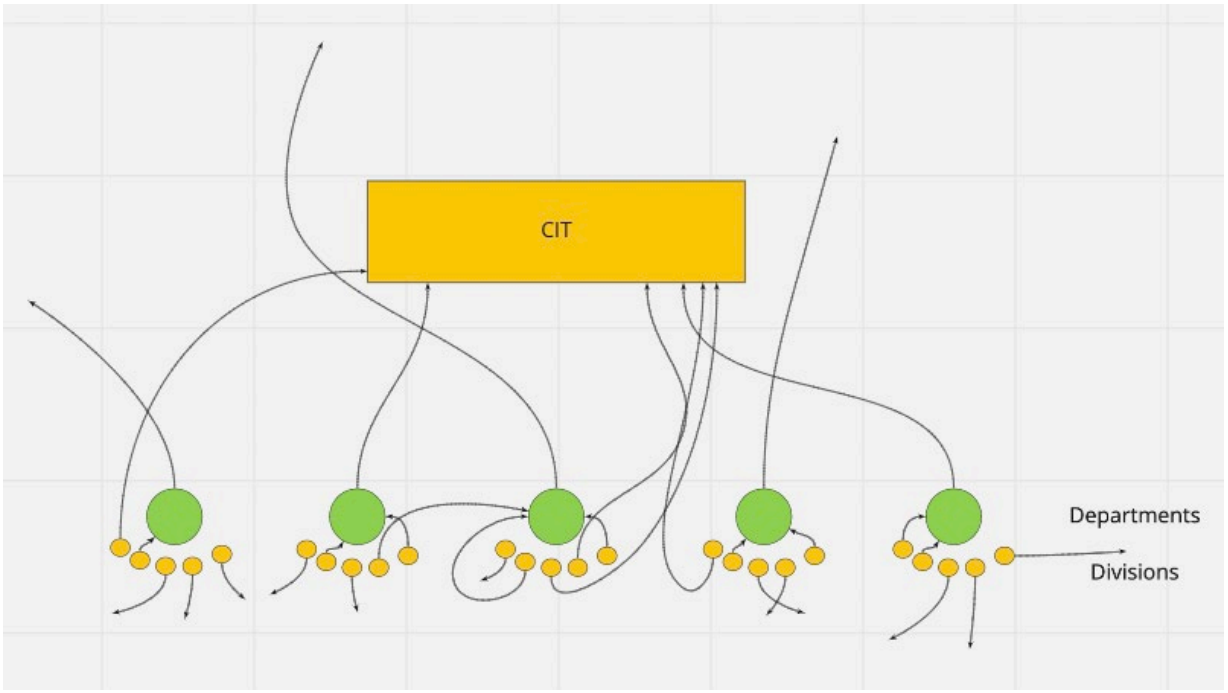

Figure 5: Current Operating Model

This diagram illustrates the current disjointed and inconsistent, if not chaotic, operating model where some departments interact with CIT while others do not; where some divisions interact with some departments and/or divisions and/or CIT and some do not.

The consulting team notes the following characteristics in the current model:

- Non-aligned technology investments and strategy.
- Decentralized decision-making and prioritization of efforts and initiatives.
- No central design authority.
- Workplan activity is opaque / unclear accountability = delivery timeline drift.
- No capacity checkpoints = a tendency to over-commitment and under-delivery.
- Perceived to promote local innovation, although capitalization on local innovations rarely are scaled to deliver corporate value.
- Difficult to achieve corporate-wide consensus and make progress on corporate-wide issues and opportunities.
- Defaults to local / non-corporate approach which results in divergence, duplication, overlap, application proliferation and ever-increasing complexity.

The current arrangement has not been consciously designed by City leadership. It has evolved over time and is sub-optimal, delivering less-than-satisfactory outcomes.

Some form of change is necessary.

2.3.2 Current Governance

The consulting team's assessment of the current governance model suggests that there are key gaps in the City's technology governance approach.

This means that the City's technology investments and program delivery lack the oversight and coordination necessary to be as effective as possible and to optimize the use of limited funds and efforts.

The table below shows the consulting team's evaluation of key governance functions that should be in place.

It indicates that Thunder Bay is either weak or does not have structures or processes in place relating to an Executive IT Steering Committee, programs and systems working groups, an IT intake and investment process, project portfolio and project delivery, IT policies and IT architecture and standards.

Typical Structures and Processes	High Performing	CTB	
Executive IT Steering Committee	Yes	Weak	CIT Steering Committee ineffective
Working Groups (Programs, Systems)	Yes	DNE	No specific groups defined or meeting consistently to oversee core systems (roadmaps, expansion, projects or upgrades)
IT intake & investment process	Yes	Weak	No formal process for rating/ ranking/ prioritizing technology requests across portfolio – business adds items to budgets
Project portfolio & project delivery	Yes	Weak	Lacking project delivery engine
IT policies	Yes	Weak	1 IT policy. New policies are being developed
IT Architecture & Standards	Yes	Weak	There is no formally defined architecture

Figure 6: IT Governance Assessment

We believe that maturation of governance processes is critical to achieving greater focus and to advancing the City's digital agenda.

2.3.3 IT Management Best Practices

We also noted important gaps in the City's maturity in terms of key functions that the City should have in place to deliver technology and digital solutions effectively.

The following table illustrates the results of our findings. This table lists the key capabilities that we believe a municipal organization should have in place to operate their IT function effectively and appropriately.

While IT Service Desk, IT Financial Management, BCP and IT DR Plan and IT Security are rated as "strong", there are several areas noted as "weak" and Project and Program Management is non-existent (Does Not Exist – DNE).

Strong	Ok	Weak	DNE

IT Service Desk	
IT Governance *	
IT Financial Management	
Architecture and Roadmaps *	
IT Organization	
Project and Program Management *	
Business Systems	
Technology Infrastructure	
Data Management	
BCP & IT DR Plan	
IT Procurement	
Technology Training	
IT Change and Service Management	
IT Security	

Figure 7: IT Management Practices Assessment

We flagged two specific areas – Architecture and Project and Program Management – in which we did a deeper dive to fully understand the current state.

Architecture & Roadmaps	High Performing	CTB
Information & Data Architecture	Yes	DNE
Application Architecture	Yes	DNE
IT Architecture "Board"	Yes	DNE
Key IT Infrastructure Roadmaps	Yes	Ok
Key Application Roadmaps	Yes	Weak
Technology Standards	Yes	Ok
GIS Strategy	Yes	Ok
Web & Digital Strategy	Yes	Weak
Ability to monitor future technology trends	Yes	DNE

Figure 8: Architecture and Roadmaps Assessment

Project & Program Management	High Performing	CTB
Standardized opportunity intake process	Yes	Weak
Prioritization/ranking of opportunities	Yes	Weak
Project Management Framework	Yes	DNE
Project portfolio performance reporting and monitoring	Yes	DNE
Resource Management	Yes	Weak

Figure 9: Project and Program Management Assessment

The consulting team concluded that the City lacks an effective "engine of project delivery" – a shared and consistent methodology and a dedicated team of staff who are skilled at repeatedly and successfully delivering technology initiatives – and it needs one for the work ahead.

This is a core competency that the City should develop.

Also, the City needs to do a better job of evaluating solutions for "fit" with the City's existing technology estate – this is the role of IT Architecture – to which the City currently has no resources assigned.

In both areas, the City's capability and capacity is limited. If not addressed, this will inhibit future progress on digital objectives.

2.3.4 IT Organization Structure

The consulting team notes that the CIT team has some good skills, capabilities, and strengths in the management of the core technology environment, helpdesk services and application support.

As a result, the team is reasonably well-equipped to manage the core, utility IT services, providing core IT infrastructure and IT support. Some small changes in philosophy and approach – with IT functioning more as an enabler, rather than a gatekeeper or controller in these areas – will be key to the organization getting more value from these functions.

However, there are some important gaps in resourcing, and these gaps correspond to areas where the City has low maturity (as identified in the previous section).

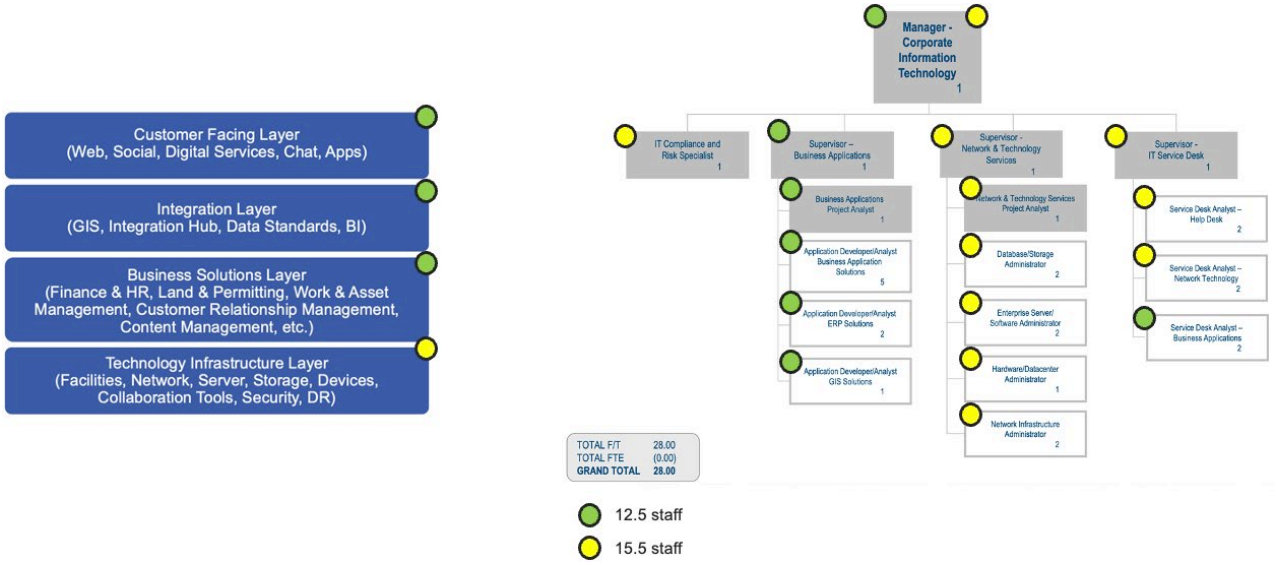

Figure 10: Current CIT Organization Structure

The business solutions space is less well-resourced than other teams in CIT and this is the area in which the MTM reveals challenges.

In addition, the following areas also require additional resources, and these correspond to the areas that exhibit low maturity in the IT Management practices assessment.

- Governance and project portfolio management.
- Project Management.
- Business Analysis.
- GIS leadership.
- Data and analytics.
- Digital solutions.

Looking forward, the City will likely need to make investments in these areas to advance its technology and digital capabilities.

2.4 Benchmarking Results re: Investment in IT Staffing

In the context of organizational needs, when benchmarked against other Ontario municipalities, Thunder Bay's investment in IT staff is significantly lower than comparable peers.

As illustrated in the summary slides below, for IT Staffing (percentage of total), Perry Group's suggested range is from 2.5% to 5%; Ontario municipalities generally fall in the 0% to 3.7% range. Thunder Bay sits at 1.2%.

Perry Group's suggested range for IT Operating Expenditures is from 2.5% to 4.5%; Ontario municipalities generally fall in the 1% to 3.5% range. Thunder Bay is at 1.2%.

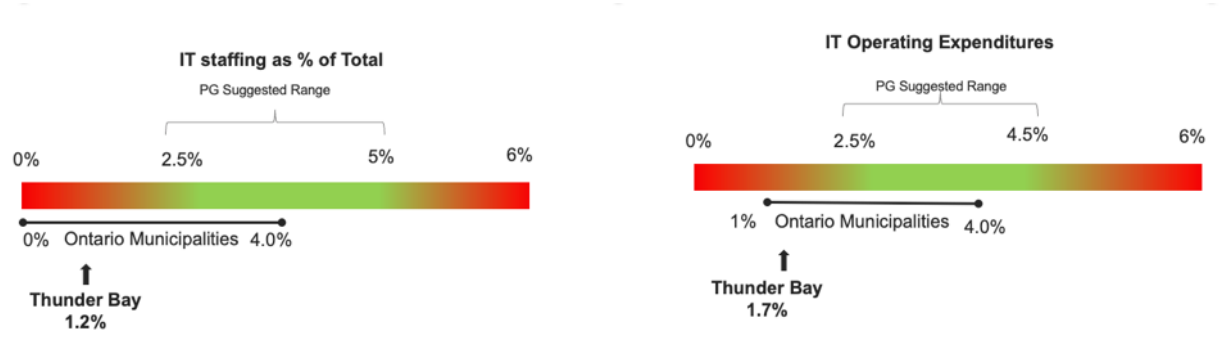

Figure 11: Benchmarking Results

Thunder Bay's expenditures are below peers and the median rates flagged by the Municipal Benchmarking Network (MBN) benchmarking.

The City operates well below the Perry Group recommended ranges for IT staffing and within the operating expenditures which suggests that municipalities should target at minimum 3% of staffing and budgets toward technology. Gartner and other IT industry benchmarking sources suggest higher levels of IT investment.

The consulting team also reviewed historic CIT staffing levels. The data indicates that, albeit with some fluctuations over the years, the City's CIT team in 2021 is the same size as it was in 2001. In those 20 years, the importance and impact of IT on the organization has been transformed.

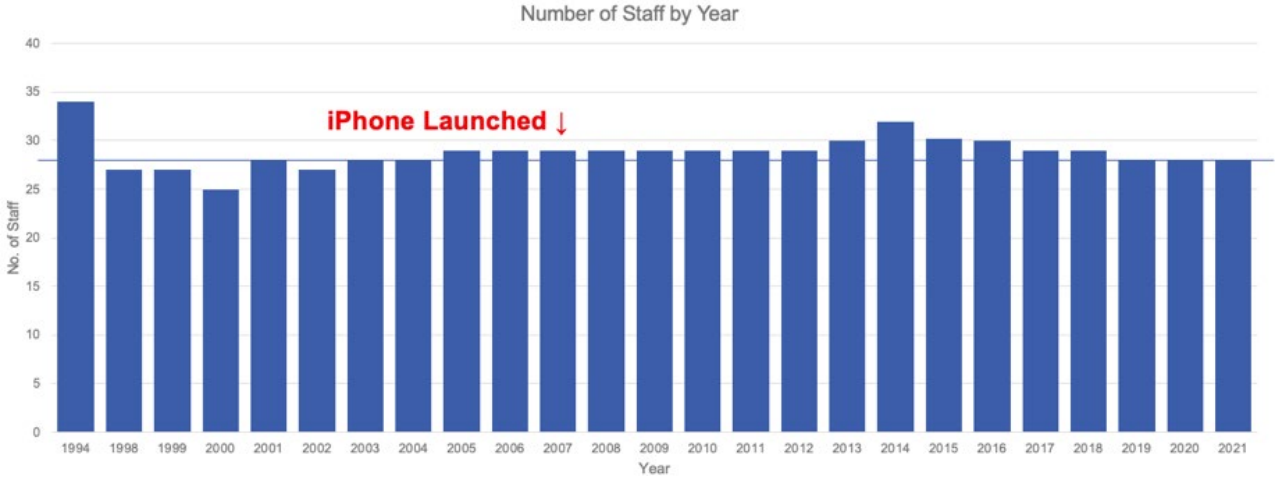

Figure 12: Historic CIT Staffing Levels

This data, coupled with the benchmarking data shown above, suggests that the City is under-resourcing the technology team.

2.5 Program and Service Review Recommendations

Many of the findings of the consulting team's Digital Strategy discovery work echoes observations from the Grant Thornton Program and Service Review.

The PSR report made the following recommendations, with which Perry Group is in full agreement and which many of the recommendations contained within the Digital Strategy are designed to address.

PSR Recommendations

"Overall, IT should be considered a strategic pillar to service delivery and internal processes. As such CTB should consider technology to be a core function and area for inclusion for any project/process being planned or implemented."

"Initiated IT projects should be tied to projected ROI and then actual ROI measured to see if IT is optimized."

"IT should be a part of groups such as cross-CIT (and functional project teams or planning committees to across all departments). CIT informs divisions of how technology can tie into their activities/objectives."

"Potential investment might be needed for each division to hire or expand roles of dedicated superusers."

"Develop more performance metrics to demonstrate progress and success and communicate them with relevant internal leaders."

"The City should develop a comprehensive Digital Strategy that is connected to the overall City Strategic Plan and its objectives. The Digital Strategy should encompass all aspects of Information Technology in the City including use of technology, data handling and data security, schedule for updates, best practices on how to choose technology software, when and where to involve the CIT team on general and division level projects. The parameters of where CIT can help divisions and which areas divisions need to resource themselves should be outlined."

"The Strategy could tie to business outcomes (automation, savings, productivity, less duplication which can be tied to ROI projections). The Digital Strategy should define divisions clearly and communicate to all to improve understanding of what each division is responsible for. The communication of the Digital Strategy should include how technology will be used to achieve the goals of the corporate Strategic Plan."

"This will allow for proper staffing and budgeting at the division level in other departments."

"A standard methodology should be created for divisions software, for choosing vendors, purchasing, implementation and ongoing maintenance with a clear understanding of what CIT's leading role should be in said vendor selection/implementation processes."

"Communication of the importance of IT can empower the CIT team to become more proactively involved in organization decision-making and play a more active role in transforming how both internal and external services are more efficiently delivered, e.g., how to incorporate Smart City initiatives within various divisions. Development of a

Strategy might require investment for an external consultant (if needed) and implementation."

"A comprehensive plan to address software updates with regards to performance and security is essential. The plan should outline when scheduled updates occur and should be communicated with all departments. Information should be shared online such as the main Intranet page."

2.6 Digital Maturity Assessment

Finally, to wrap up all the assessments, the consulting team conducted a maturity assessment, using Perry Group's municipal Digital Maturity Assessment.

The Digital Maturity Assessment is the basis for assessing the current state, identifying future opportunities and identifying the targeted state.

The results of the Digital Maturity Assessment and Progression help to clearly delineate the stages of progression and what each stage means to the end user.

The figure below identifies 5 Levels of digital maturity:

- Level 1 – Digital Resister
- Level 2 – Early Experimenter
- Level 3 – Digitally Accelerating
- Level 4 – Digitally Transforming
- Level 5 – Digital Leader

The Digital Maturity Assessment helps a municipality identify what its current level of digital maturity is as well as what it strives for its target state to be.

It can easily be used as a benchmark for tracking, measuring, and reporting on progress against the defined targeted levels of maturity. It can also be used to monitor improvements over time.

The assessment scores Thunder Bay 2 out of 5 for its digital maturity, illustrating there is much ground to cover to become a more digital organization.

In the figure below, the items highlighted in blue and yellow highlight current characteristics that the consulting team observed; green points to the characteristics or capabilities that the City must put in place to make progress to becoming a digitally accelerating organization, namely:

- Put Governance in place.
- Focus on increasing digital literacy and collaboration.
- Digitize cross-corporate processes end-to-end.
- Put key digital platforms in place.
- Define current and target technology.
- Conduct data analysis to assist informed decision-making.

1. Digital Resister

- No leadership, vision or strategy on digital along with an absence of governance and business strategies
- There are few digital skills within the organization which is typically unengaged, traditionalist and uncollaborative
- Business focus is not citizen centric and the approach on customer service is divergent and siloed between areas
- Corporate systems are absent or utilized < 10% leaving siloed areas largely reliant on inefficient manual workflows
- Digital service is hampered by an anti-cloud position with an overburdened IT acting as an "order taker"
- Data is looked at for compliance purposes versus rather than an asset that can be leveraged for efficiency and service delivery

2. Early Experimenter

- Some visioning around digital but there are competing views between service areas
- There are small pockets of digitally skilled, tech-savvy staff, but largely are unguided and unconnected – digital is explored off the side of their desks
- Culture is skeptical of change and project management is disconnected from corporate objectives and strategy
- Core business solutions are in place but are outdated, some digital tools but aren't fully leveraged or integrated as decisions are made by service areas directly
- Some collaborations between keeners in each areas, however, notions of digital differ widely
- No corporate standards, practices or resources are in place to support ideation and leverage digital tools already in place

3. Digitally Accelerating

- Governance is in place to align digital and business strategies with guidance from corporate policies, standards and a service inventory
- Recruitment and training efforts have some focus on increasing digital literacy and collaboration is ad-hoc, but occurring (internally and externally)
- Core high volume, cross-corporate processes are fully digitized end-to-end and if digital tools are not deployed, staff are finding and using their own to make work easier
- Agile approaches are used to support small and niche implementations and key digital platforms are in place but lack integration and consolidated value
- Current and target technology architecture is defined but some key systems and infrastructure are delaying growth of digital
- Digital processes and use of agile are designed to be repeatable and slowly scaling out and data analysis is assisting some areas in making better decisions

4. Digitally Transforming

- Senior leadership and Council are formally behind digital transformation with alignment to strategies, talent recruitment and training
- Digital is embedded into business planning and service channels are used to index improvement projects delivered through agile and followed up by quality audits
- There is active engagement and collaboration with community and industry partners along with a 360 view of customers with a mission to exceed service standards/expectations
- An architecture function guides evolution of the technology landscape along with data governance and cloud adoption
- End-to-end processes are fully digitized and core systems are current, well utilized and managed as products vs. projects
- Customer profiles and predictive service delivery employed through some integration of web, a digital platform and a CRM – not employing all capabilities but priorities are reviewed to support forward momentum

5. Digital Leader

- Digital is the mantra of the organization driven by aligned leadership and governance who focus on the "art of the possible" vs. digital transformation
- Experimentation, collaboration and coproduction *are* business as usual and all areas employ a design-thinking approach to meet and optimize service standards
- Digital inclusion opportunities are made available through community partnerships and customers are actively involved in shaping/prioritizing how service is delivered
- Modern, digital and mobile platforms in place evolve alongside defined architecture and a roadmap that standardizes digital/cloud/data-first
- Digital service channels are supported by web and CRM which provide predictive service to citizens and improved using aggregated service data
- Business processes are geo-coded, IoT based infrastructure is the norm and machine learning/AI is employed to make work more efficient

Figure 13: Digital Maturity Scale

People	
Corporate Leadership	2
Digital Vision	1
Digital Strategy	1
Digital Leadership	2
Digital Talent	2
Digital Literacy	1
Digital Governance	1
Organizational Alignment	1
Workforce Readiness / Change Readiness	3
Digital Culture / Tech Savviness	1
Community Involvement in Digital	1
Industry Partners	2
Customer Knowledge / User Research	2
Community Digital Inclusion / Literacy	3
Average People Score	**2**

Process	
Service and Process Inventory	2
Service Standards	2
Process Maturity Assessment	2
Process Design Capability	2
Process Digitization	2
Agile Methods and Approaches	1
Technology / Digital Training	1
Change and Adoption Management	2
Modern Procurement	1
Average Process Score	**2**

Technology	
Architecture	2
Applications / Business Solutions	2
Mobile	2
Collaboration	3
Customer Digital Experiences	2
Staff Digital Experiences	2
Web Platform	3
Digital Service Platform	2
CRM Platform	1
Cloud	2
Social	3
Data	2
Analytics	2
Geo / GIS	2
Connected Things (IoT)	1
AI / ML	1
Networks (Private, Public, Community)	2
Average Technology Score	**2**

People 2/5
Process 2/5
Technology 2/5

Level 2
Early Experimenter

Figure 14: Digital Maturity Assessment Scores

Following is a summary of the City's current state which puts the Early Experimenter mode into context.

While a Level 2 – Early Experimenter may appear to be a low score, in fact, the City shows some characteristics of a Digital Resister (highlighted in yellow, for example, Corporate and Digital Leadership, Digital Talent, Industry Partners, Customer Knowledge, Customer and Staff Digital Experiences, Digital Service Platform, etc.) which would rate the City at a Level 1.

Clearly, any resistance to digital opportunities must be tackled (the Strategy focuses on expectation setting, education, training and showcasing) if the City is to progress on its digital maturity journey.

2.7 Current State Summary

The current state assessment confirms that the City of Thunder Bay has some significant work ahead.

The City appears to be behind peers such as Cambridge, Kingston, Guelph, Milton, Waterloo, Chatham-Kent, Newmarket, and Red Deer in taking advantage of technology and digital capabilities to deliver efficient and effective City services. There is some significant catch up required.

As noted in the 2020 Program and Service Review, there are numerous opportunities in every division and business unit across the City to use technology to deliver more effective customer service and to deliver more cost-effective services.

In fact, demand in each of the business units is significant. Meetings with teams from across the City identified over 260 possible digital and technology initiatives that the City could pursue that would result in streamlined processes and improved customer experiences – this is perhaps 10 years of work.

The City cannot possibly tackle all this work in the short- or even medium-term. It must prioritize the most impactful initiatives that align with strategic objectives and commit resources to implementation.

But, capitalizing on these opportunities will require investment – investment up-front in staffing and resourcing projects, consulting services, software and solutions, training, and education – to save in the long-term on process and automation efficiency, agility and flexibility, policy and cost saving insights. A classic invest-to-save equation.

We believe that local government is at a tipping point – where service is increasingly digital, where leveraging digital technology must become a core capability of any effective municipality, and where municipalities move from face-to-face, paper-driven processes, to automated, digitized and self-serve services that are designed for the next quarter century.

So, the next sections of this Strategy lay out a Vision, identify the priorities, and set out how the City can set itself up for future digital service success.

3.0 Digital Vision

In light of the current state findings, the Digital Strategy starts by setting a new Vision for the role and importance of technology at the City and the way that services should be delivered.

3.1 The Vision

The Vision for the City's information, technology and digital programs is to pursue:

A collaborative approach to delivering customer-centred, digitally-powered City services.

The Vision encapsulates some important ideas.

- That collaboration is at the heart of digital success.
- That City services to the community is the core of what Thunder Bay is about and that "efficient, accessible, easy-to-use, cost-effective and digitally-powered" serves that mission.
- That the City should design its services around customers, not around internal needs, and
- That the City intends to modernize how it delivers services by taking advantage of digital technologies for both internal and customer-facing services.

3.1.1 Customer-Centred, Digitally-Powered City Services

What do we really mean when we say "…***customer-centred, digitally-powered City services***?"

In a future in which services are digitally-powered, interacting with the City should be simple, straightforward and designed around convenience for customers and staff alike.

The following vignettes are provided to help the reader understand the trajectory that the Strategy establishes, if not the exact solutions that will implemented.

On her way to work, Mary witnesses a minor car accident. A stop sign has been knocked over. Mary pulls out her smartphone, takes a photo of the scene and uses the CityApp to notify the City of the problem.

The notification is received, automatically categorized, located, and recorded in the City's customer request management and work management systems.

The work management system automatically dispatches a request to a crew in the area who receives it on a laptop in their work vehicle. As an emergency work order, they proceed to the site and erect a temporary stop sign. Mary gets an update to let her know that a temporary fix is in place.

On the way home from work, as she passes the scene of the accident, Mary feels reassured that the City is working hard and smart to keep citizens safe.

A couple of days later, the sign crew visits the site and replaces the stop sign. Mary receives a notification on her smartphone that the issue has been resolved and is

asked to rate her satisfaction with her interaction with the City. She is pleased with the service and rates it highly.

In the background, integrated technologies such as telecommmunications, networks, mobile devices and business systems (e.g., CRM, Work Management, GIS, and Finance systems) are working in concert to allow customer service agents to offer simple access to services and for work crews in the field to be provided with the information (asset records, maps and drawings) they need to fulfill the work order. Processes have been designed across departmental lines to make the end-to-end process simple for customers to interact with and easy for staff to administer.

Marc has moved into a new home in the City. He calls the City to inquire about setting up his tax payments via direct deposit. The customer service agent directs Marc to the online sign-up page on the City's website.

The agent shows Marc other services available online and asks, "Is there anything else I can help you with?"

Marc proceeds to book his youngest child, Rachel, into swimming lessons, locate the nearest library, find out when garbage collection day is and where he can pick up a new compost bin, and checks out parking options near his new job and purchases a parking pass. All with one call.

Enabling customer service agents to handle multiple transactions from different departments doesn't happen by accident. It has to be planned, processes must be designed, and systems implemented and integrated to allow agents to provide answers to commonly asked questions and to route requests to the approriate back-office team as needed.

A local developer, Nicole, has received approval for a small townhouse development in a local neighbourhood and is now ready to build.

She goes to the City's website to apply for the necessary building permits where she completes each application, uploads the drawings, and pays for the application.

The City reviews the plans and circulates the digital drawings to various departments and external commentors. The City requests a number of revisions which are marked up digitally and returned to Nicole. Nicole submits amended drawings online, which are approved, and the permits are duly issued.

As building proceeds, Nicole needs the footings to be inspected. Using her smartphone, she books an inspection for the next available slot. Jim, the assigned inspector, meets Nicole on site the next day. Using his tablet to conduct the inspection, he takes pictures and records all the checks in the system.

With the inspection completed, Nicole's build is greenlit and Jim emails the inspection results to Nicole before heading off to his next inspection.

End-to-end, real-time transactions are becoming common in the private sector (think about hotel or airline bookings or interactions with your bank) and are increasingly expected by those who interact with the City. Moreover, significant efficiencies are achieved; in the example above, think of the reduction in paper, elimination of unnecessary customer visits to City Hall, and reduced costs and delays from mailing out inspection results, to mention just a few.

On a summer evening stroll, Gilles notices a new development approval sign on a vacant lot near his house. He notes the application number and when he returns home, searches the City's website for information.

He finds the full details of the planning application, its status and planned timelines, drawings, and renderings of the proposal. He also finds a listing of related meetings (community consultations, Committee of Adjustment) and reviews video recordings of the meetings to find out more about the history of the application.

The website allows Gilles to set up alerts to be notified of future activity and consultations on this planning application. He can submit his comments and questions about the proposed development online, and he can review comments submitted by his neighbours. Gilles feels engaged in a local decision that is important to him and his family.

Each interaction leaves a lasting impression of how efficient and effective the City is and allows for more effective engagement with more transparent government processes.

At the end of a day of meetings, Beth (who has worked for the City for 12 years) remembers she needs to book vacation time for an upcoming trip she is going to take.

She pulls out her City-issued smartphone and opens the CityApp. She checks her vacation bank to make sure she has enough leave and then makes the request. She fills her timesheet for the day in the time recording portion of the App and remembers she has an expense claim to make for lunch she purchased for meeting attendees as they worked through lunch.

In the CityApp, she takes a picture of the receipt and submits the expense claim. The system automatically routes the leave request and expense claim to Frank, Beth's boss, who checks the staffing schedule in the CityApp for coverage and, seeing that all is well, approves Beth's leave request and the expense claim.

It is not just customers who appreciate efficient, simple, and easy-to-use processes. Staff and Managers within the City are often frustrated by inefficient, slow, paper-based internal processes. Modernizing the employee experience so that frequent interactions and tasks are streamlined and easy-to-use, increases productivity and reduces frustrations.

City Fire officials are 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 Rescue Service target its resources more effectively with concentrated communications and advertising, fire prevention education and inspections, all of which contribute to a 10% reduction in residential fires, significantly reducing loss of life and property in the City.

Data analysis, such as in the example above, has value across all parts of the City's operations, from snow clearing to recreation programs, from capital construction to economic development. It is anticipated that deeper data analysis will reveal opportunities for improved outcomes, service delivery cost savings, efficiencies, and improved service delivery.

These are not, and should not be, dreams of a long-distant, unattainable future. Municipalities across Canada are delivering their services in this way today.

For instance, citizens in Guelph, Waterloo and Cambridge can submit and track building permits and drawings online. Burlington staff and management handle their time and attendance processes via an employee app. Barrie residents monitor their water consumption via an online dashboard. In Innisfil and Richmond Hill, reports of a stop sign being knocked down are directed automatically to the relevant field crew's mobile device for resolution. In Oakville, people can search and review planning applications and associated drawings online or lawyers can generate their own tax certificate online. Brampton and London Fire Departments use GIS to identify hot spots, focus their fire prevention and education work and reduce risk and loss in their communities.

Communities throughout Ontario are using technology in many ways to provide innovative and cost-effective customer service.

The vignettes provided here are used to paint a picture of the future that the City should aspire to and aim for and this Strategy is designed to take the City in this direction.

3.2 The Importance of Digitization

However, before the City can itself achieve this Vision, it must digitize its processes – an area in which it currently lags behind its peers.

To enable the types of integrated service offerings experienced by Mary and Marc, Nicole and Gilles, Beth and Jim, the City must use its business systems to digitize and automate processes.

As has already been noted, today, too many of the City's processes – such as its work management, land development permitting, and HR processes are paper-based and manual – inhibit the ability to deliver these improved services and experiences.

Effective municipalities rely on a combination of **people**, **processes,** and **technology,** working together in a synchronized fashion, to deliver services to customers, as illustrated in the diagram below.

This Strategy introduces some new terms to guide leveraging technology to improve processes. The term **digitized** represents a move away from paper-based processes to electronic, online, workflow managed, real-time processes. The term **platform** represents a common set of **processes** and **technologies** that connect staff and customers to deliver a set of services.

The **digitized platform** supports electronic end-to-end processes.

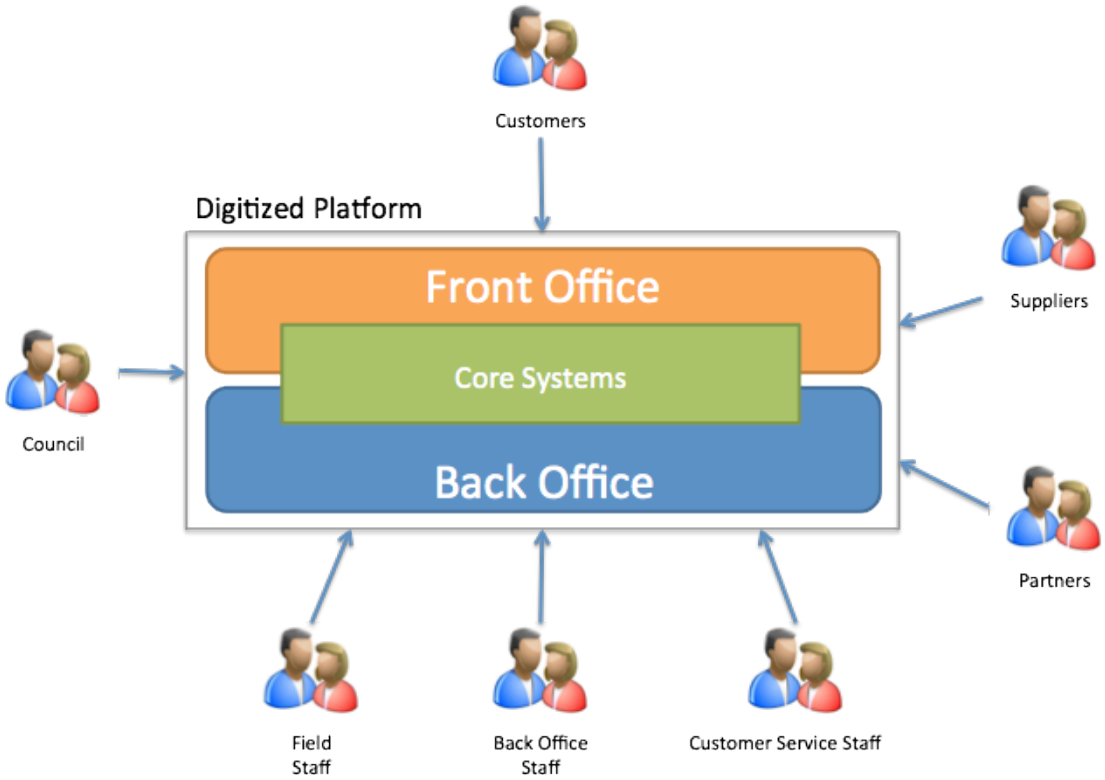

Figure 15: The Digitized Platform

The digitized platform is centred upon a powerful central core of business systems (e.g., Enterprise Resource Planning (ERP), CRM, Work Management, Permitting, Licensing and Land, Recreation Management) that drive large parts of the City's operations.

The business systems used by the City should be common and shared across departments and divisions so that tasks initiated in one area can be allocated to another, such as a change in a permit application status (in Building) triggering the processing of a pre-approved payment (in Finance).

The full digitization of processes provides the foundation for becoming an efficient organization that can deliver ***great services, digitally-powered.***

When processes are digitized and managed electronically, all necessary transaction processing – workflows, notifications, quality checks and validations – can be carried out via a device, and can happen anywhere, anytime (in the office, at a worksite, in a truck at the side of the road, or at home).

Offline steps (manual interventions such as checking a paper file or getting a physical signature) are reduced or eliminated. The online chain provides complete visibility of the process throughout the organization – anyone can check the status or find out required information.

Systems manage the routing and workflow of the processes, including escalating items to senior staff when exceptions are encountered or where performance falls below defined levels of service.

Digitization allows the City to track its own processes, to share information between staff, and to track important management metrics that provide insights that contribute to improved process effectiveness.

In the planning application example from earlier in the report, Gilles can only find information about the planning application in his neighbourhood on the City's website if that process has been digitized in a corporate business solution.

If the necessary information is not stored in the business solution, or is not updated in real-time, or if the Committee of Adjustment meetings are not streamed and recorded then Gilles will not be able to get to the information he needs.

Digitization also makes it easier for the City to add new services or processes (such as the introduction of a new business-license type) because changes can be introduced through existing business systems that already support the online applications process, back-office administrative tracking (such as processing payments) and providing data to field crews.

Transforming from paper-based to digitized processes will involve persistent organizational as well as technological change for both IT and each business unit. This Strategy lays out an approach to accomplish this.

As highlighted in the MTM above, Thunder Bay is missing or under-utilizing some key business systems that form the core of digital platforms and are central to the City's becoming *powered by technology and data*.

Getting these in place are the necessary pre-conditions to delivering improved services and experiences.

3.3 Omni Channel: Providing Customer Choice

Digitization – or the introduction of digital services – does not mean that traditional access channels will be neglected. It is important to acknowledge that, while the City's focus on digitization drives the ability to deliver online services, it also supports improvements to phone or face-to-face services. The City will, of course, continue to offer services across many channels (web, phone, face-to-face) to meet the needs and expectations of its citizens.

The City will continue to support customers' preferred modes of interaction ensuring that no one is left behind. If a customer wants to raise a complaint about a pothole face-to-face at a local City facility, great! If a different customer wants to raise a similar complaint via a smartphone app and follow up on its status by calling into the City, that's great too!

Digital platforms must support the ability to deliver across *all* channels.

3.4 Achieving the Vision

The Vision articulated is necessarily a long-term goal, likely much longer than the immediate 3-5-year time horizon of this Strategy.

The first priority for the City in the near-term is to establish the conditions for success.

This means establishing an effective, enterprise-wide technology program that is well-governed, focused on agreed priorities, resourced and effective at delivering business technology solutions. Thus, the immediate priorities for the City relate to IT Governance, technology funding, resourcing and management practices.

While there is work to be done in all layers of the MTM, the second priority for the City is to deliver digitized processes and thus core business solutions.

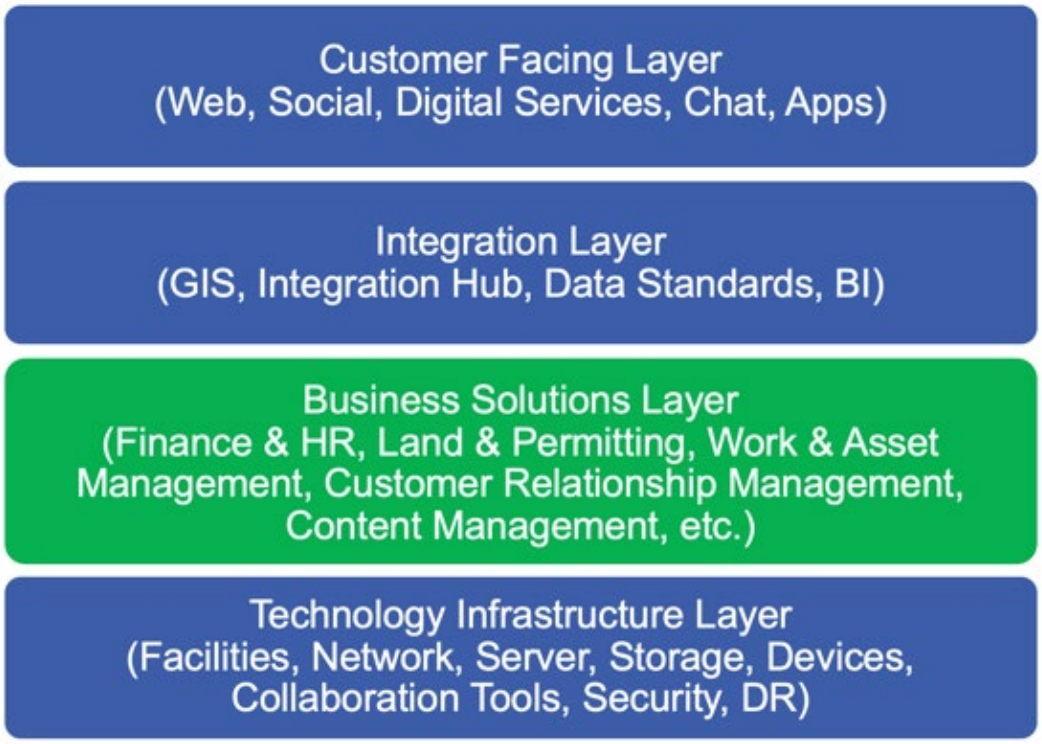

Figure 16: Focus on Business Solutions Layer of the MTM

By comparing the City's current state of IT to the MTM (shown in the diagram above) the recommended focus should be on the Business Solutions layer to build the City's **digitized platform.**

The MTM assessment identifies opportunities around integration, data and customer-facing services. In the Customer-Facing Layer, a CRM system will be important but this can only be achieved once the City has established its overarching Customer Service Strategy.

Examples of the service impact of some of this planned work includes implementing and expanding core business systems, such as AMANDA (to support Nicole's and Gilles's experiences), determining our asset management systems strategy (to support Mary's experience) and expanding SAP (to support Beth's and Marc's experiences).

While the City works hard in these areas, several initiatives will also work to advance those online services that can be implemented without a back-office solution dependency.

The third priority is to create a tech savvy and digital culture where IT and departments partner to first define the value of new technology investments and then measure and deliver that value.

With the Vision for the Strategy established, the following three sections introduce the how, who and what of the Strategy.

How will the City establish the framework for effective technology management?

Who is responsible for which areas of technology? and

What projects need to be tackled?

4.0 Making IT Happen – Building the Framework for Success

Achieving the Vision described is a change for the City and will require much work.

Working smart – in a coordinated and genuinely collaborative way and on agreed priorities – will be critical. Thus, one of the key goals for this Strategy is to establish the conditions for success for managing technology and driving digital transformation.

This section outlines the **how** – a series of recommendations that focus on how the City should improve its approach to technology and how the management of the technology program will change.

4.1 Information, Digital and Technology Governance

One of the first and most important areas of work for the City at the outset is to establish a formalized Information, Digital and Technology Governance Framework to allocate technology decision-making responsibility appropriately.

The goal is to ensure that the City is *working on the right projects, in the right way*, and ensure that decisions and resources are suitably aligned with corporate goals. In support of this goal, the framework needs to enable monitoring and evaluation of progress and outcomes.

4.1.1 What is Information, Digital and Technology Governance?

IT governance is the broad industry term used to refer to "the processes and structures which inform, direct, manage, and monitor how the organization makes the best and most effective use of technology."

It is designed to ensure that the right people are making the right decisions, at the right time, with the right information.

In some cases, technology decision-making will mean collective decisions on corporate priorities; in others, it will involve technical decision-making such as the best data storage technology. Thus, it necessarily involves different groups with different knowledge, experience, and skill sets.

Organizations often view decisions about technology as complicated, technical and "best left to the experts in IT". However, decisions about technology often reflect fundamental questions about business priorities and how service gets delivered, such as:

- How do we want to use technology in our business?
- What technology do we want our people to use, and how do we want them to use it?
- How much should we spend on technology?
- Which of our business processes should we direct our IT dollars toward?
- What do we need to tackle first?

- Should we do this now, or later?
- How secure do we want to be?
- What should be available first in the event of a data centre outage or a disaster event?

These are not just decisions for technologists in the CIT Division – they are important business decisions for leaders of the organization.

There will always be purely technical decisions for IT staff with the appropriate expertise to make; but in most cases, IT experts should be advising business leaders – providing options and recommendations.

An IT Governance Framework facilitates this collaborative working, assigning accountabilities and, at the right time, bringing together the appropriate mix of leadership and staff from appropriate departments and disciplines.

An IT Governance Framework for Thunder Bay should have the following goals.

- Establish a clear mandate and authority for **all**[1] information, technology, and digital decisions.
- Engage stakeholders directly in technology and digital decision-making.
- Better coordinate corporate technology and digital initiatives for which wider benefit can be derived.
- Establish a more rigorous evaluation and selection process for technology and digital projects – to ensure a focus on "high value" projects (aligned with budget).
- Ensure more effective resource utilization within IT and the business by focusing on corporately-agreed directions.
- Track the business benefits and value accrued from investments in technology.

The recommended framework is made up of four elements, discussed in greater detail in the following sections:

1. Decision-making groups and individuals (e.g., group membership, roles and responsibilities, inter-relationships).
2. Policies and standards (e.g., architecture, software procurement policy).
3. Processes and methods (e.g., prioritization, project execution).
4. Measurement and monitoring (e.g., Key Performance Indicator (KPI) reporting).

[1] This refers to information management, technology, digital and operational technology decisions.

What is Operational Technology?

There has traditionally been a distinct line between Operational Technology (OT) and Information Technology (IT).

So, what is the difference between IT and OT?

In short, IT deals with information, while OT deals with machines. The former manages the flow of digital information (data), while the latter manages the control and operation of physical processes and the machinery and devices used to carry them out, e.g., chlorinators, pumps, etc.

OT is traditionally associated with industrial environments and includes industrial control systems such as supervisory control and data acquisition (SCADA).

However, increasingly in industry, in municipalities and utilities there is a growing convergence and intersection between Operational Technology and Information Technology where accessing OT through IT systems brings shared benefits.

For example, benefits can be achieved by using shared networks to reduce maintenance and operations costs, by applying consistent security controls and management practices, or by collecting information from Operational Technology systems and integrating that data with Information Technology systems. For instance, connecting SCADA systems to work management systems to generate preventative maintenance work orders when a pump has run for an allotted amount of time, or for an LED streetlight to self-report an outage.

An increase in the use of Internet of Things (IoT) technologies and an increased number of sensors on vehicles, as part of water networks, on light poles, and in garbage cans, only further blurs the line between OT and IT.

The governance model presented in the Strategy is intended to tackle information, technology, and digital domains. It also heightens the importance of, and attention paid to architecture. Designing how OT and IT interact and share infrastructure is an important part of this.

So, going forward, any technology – regardless of whether it is OT or IT – that creates data should be subject to the broader information, digital and technology governance process.

Practically speaking, what does this mean for those that operate and rely on OT systems? Day-to-day management of Operational Technology continues to be the responsibility of those who use that technology to deliver the service (people in Fire, EMS, Water and Wastewater, Traffic, Transit, etc.).

However, significant OT initiatives should progress through the Idea → Project Lifecycle, follow the PM practices laid out for technology projects, and should be monitored and reported as part of the overall IT portfolio.

Furthermore, OT systems should be subject to regular security checks and testing as part of the corporate security program.

4.1.2 Decision-Making Groups – Governance Model

The Information, Digital and Technology Governance Framework defines groups and individuals with clearly-defined responsibilities and accountabilities.

It is important to note that the words **Information, Digital** and **Technology** have been broken out deliberately. This is to reiterate the importance of focusing on Information and Digital, as well as Technology as separate disciplines and domains that are governed in a coordinated and singular manner.

This means that information-management-centric topics (such as document and records management, retention of electronic records) are part of the domain of the Information, Digital and Technology Governance Framework, as is strategic decision-making around the City's website and digital services.

At this stage in the City's journey, the most important function of the governance model will be to keep the City focused on priorities that support corporate objectives – this will require the authority of the EMT.

At the same time, the governance model must directly engage GMs, Directors and Managers in decision-making, ensuring that buy-in can be secured, feedback can be received, and that institutional learning about how to effectively deliver enterprise IT programs can be developed.

As a result of these drivers, the following governance bodies are suggested.

- **Information, Digital and Technology Governance (IDTG)**
  This will be a leadership level group, made up of EMT members and the CIT Director and resource supports from the CIT Division.

  This group should be responsible for corporate leadership of information and technology decision-making about strategic directions, reviewing and recommending investment priorities into the budget process, monitoring project and service delivery, and reviewing and approving recommended corporate IT architectures, policies and standards.

- **Coordinating Groups**
  These are strategic working groups convened as recommended by this Strategy to provide focused governance of critical enterprise systems or information processes. They are responsible for the more detailed aspects of developing program plans, recommending initiatives/projects within program areas and for monitoring progress, resource usage and outcomes.

  These groups will be made up of Director- and Manager-level individuals.

  Program plans developed by these groups are reviewed and approved by the IDTG. It is recommended that, initially, groups for the following areas be established:

  - Digital, Web and Customer Service.
  - Enterprise Resource Planning (Finance/HR – people and money).
  - Asset Management Systems.

- Land and Property Systems.
- GIS and Data.
- Information Management.
- Digital Workplace and Technology.

Other groups may be added in future, for instance around information management or mobile working.

- **Project Teams**
  Project teams are formed and disbanded as needed to tackle business technology projects. Depending on the size of projects, different roles must be formally assigned, including Sponsor, Project Manager, Business Analyst, Technology Lead, and business side Subject Matter Experts (SMEs).

  Projects should follow the standard methodology (discussed later) adopted by the City. Project teams will be responsible for providing regular project status reports and will be subject to project review by digital delivery.

- **Architecture Team (AT)**
  This group will be a "virtual team" or committee comprising architecture leads from the CIT Division (and perhaps some tech savvy Business Analysts). The group will be responsible for defining, developing, and recommending technical and architectural standards to CIT Management. The CIT Director should then bring proposals / recommendations forward to IDTG for review, endorsement, and/or approval as necessary.

  The group's mandate includes the development of lifecycle/roadmaps to ensure sustainability for the City's IT environment as well as reviewing ideas, concepts, and project proposals to ensure compliance with architectural standards.

4.2 Supporting Governance Functions

CIT Director[2]

Responsible for leading the development of technology strategy and policies, overseeing the operation of the Information and Technology Governance Framework, and acting as an advisor to the Information and Technology Governance Team on all matters related to effectively leveraging technology. In addition to governance support, the CIT Director is responsible for CIT Management as described by COBIT[3], "Management plans, builds, runs and monitors activities in alignment with the direction set by the governance body to

[2] Note that the Digital Strategy recommends that the CIT Manager position be made a Director level position and the Supervisors in CIT also be reviewed in line with the City's guidelines for Job Levels.

[3] Control Objectives for IT – an internationally recognized and widely applied IT Governance Framework.

achieve the enterprise objectives."

The CIT Director has management responsibility for the governance supporting groups including IT Delivery and Architecture Teams.

IT Delivery

IT Delivery is a facilitating group based in the CIT Division that supports the Governance Framework.

In summary, it assures that CIT Management and IDTG gets:
1) Properly formed project proposals;
2) Consistent monitoring across the complete portfolio of information technology projects and services;
3) Resource capacity and resource utilization reports; and
4) Project quality assurance by checking compliance with project standards.

This group would also typically be the "home" unit for the project management "engine" with resources (PMs, BAs) available for allocation to selected projects, and with pre-selected Vendors of Record (VORs) to supply contract resources as needed to support project delivery.

The Governance Framework will be expected to interface with existing corporate groups and processes. Specifically, this includes:

- **LT (Leadership Team)** – The CIT Director is currently a member of Leadership Team and should keep LT informed of technology plans and initiatives on (at minimum) a quarterly basis.
- **Work Plan** – Prior to close of the annual budget and "Work Plan" setting process, the CIT Division shall work with any business unit proposing a new technological change and ensure that a suitable project proposal is available to support the request to IDTG.
- **The Corporate Business Planning and Budget Process** – IDTG should review all technology-related budget submissions (above an agreed threshold) and approve the corporate IT capital budget before submitting to the **Corporate Budget Process**.

The arrangement of the governance groups is described in the diagram below.

While it might appear at first to be a lot of groups, this is normal – technology decisions by their nature involve a wide range of stakeholders, and today, many of these conversations are happening; just not in a formalized, coordinated manner.

The City should use this framework to promote and encourage collaboration and discourage and actively penalizes rogue or independent, secretive working.

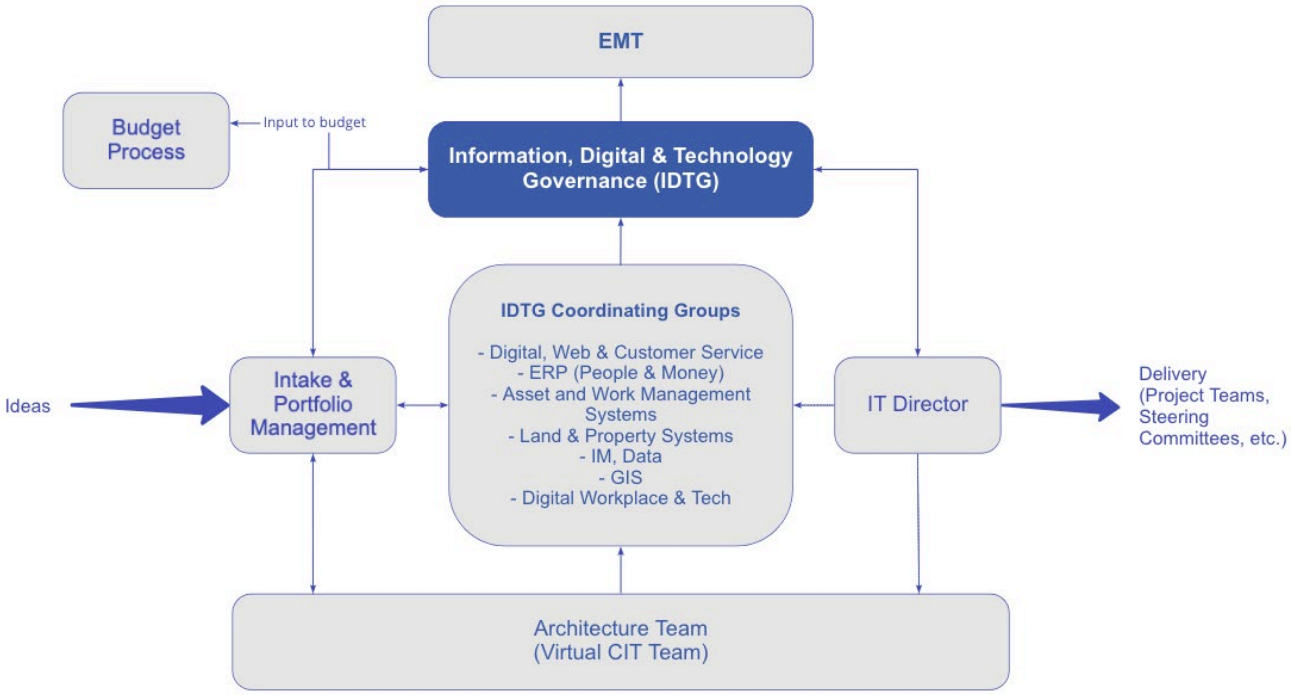

Figure 17: Proposed Governance Model

Some of the groups are IT-specific governance groups, others are involved in organization-wide governance and then there are those that facilitate the governance processes and stakeholders.

Table 5: Roles of Those Involved in Technology Decision-Making

	ITD Principles		ITD Architecture		ITD Infrastructure		Solutions Needs		ITD Investment		Accountabilities
	I	D	I	D	I	D	I	D	I	D	
Council										•	Endorse technology strategy and approve IDT investments
EMT		•								Recommends •	Enforce principles, reinforce IDT governance, monitor performance, approve policy
ITDG	•			•		Strategic •	•			Recommends •	Define IDT investment priorities, oversee IDT work plan, agree IDT strategy changes, approve arch monitor performance and delivery
IT Director	•		•	Recommends •	•	Operational •	•	shared •	•		Lead IDT governance, strategy development and plan, deliver and manage IDT systems and services
IT Delivery									•		Evaluate projects within portfolios and assist IDTG with resourcing
Coordinating Groups			•		•		•		•		Develop medium term solutions strategies, oversee projects
Architecture Team			•	Recommends •	•		•		•		Establish and recommend standards, architecture and roadmaps, evaluate for fit.
GM's, Directors Managers & Users	•				•		•	shared •	•		Articulate business needs, requirements and priorities.
Project Teams					•		•		•		Execute against needs, and requirements.
Public / Customers							•				Express service requirements and expectations.

I = Input D = Decision

Information, Digital and Technology (IDT)

The consulting team has provided more details to City staff, in terms of the mandates and terms of reference for the various governance groups.

4.2.1 Communities of Practice

Outside of the formalized governance model, there are many people across the organization outside the CIT team who are involved in service and process design, systems usage, data analysis, web publishing, change management and providing systems training and help.

We also recognize that there are many savvy, technically-minded staff in departments and divisions who are constantly looking for better ways to do their jobs and use technology to do so.

Broadly speaking, this is the City's digital community. These are change agents who are pushing the boundaries, exploring, experimenting and learning. These people are critical to advancing the City's digital capabilities and the City should look to encourage and empower them.

There is value in harnessing this group and aligning work across the broader digital community including web, GIS, data, business support specialists and business managers.

The City should use Communities of Practice (CoPs) as an approach to tap into and share the experiences, skills and knowledge that already exist across the City.

This means using CoPs to bring together people who are working in a common area (e.g., GIS, data and analytics, project management, business process design, service improvement, mobile workers) to share learning and good practices, showcase good work, identify shared challenges and needs, share valuable information and insights and to contribute to identifying the need for standards and accelerate knowledge mobilization.

CIT will take the lead to actively enable and facilitate communities, providing groups with open digital collaboration spaces and participating in the communities as peers, listening for opportunities for improvement and amplifying where opportunities exist.

4.2.2 IT Policies and Standards

IT Policies

Consistent with the commentary throughout this section, many of the decisions related to technology are business or management decisions. These are not decisions to be made by CIT alone on behalf of the corporation. For example:

- Which employees get smartphones?
- Who can buy new technology?
- Can a member of staff use their personal phone at work?
- Who is authorized to register a web domain for the City?
- Which websites can staff access, and should that activity be tracked?
- What content is saved when an employee retires?
- How much space does an employee have in email?
- Which systems need to be up and running first in the event of a disaster?
- How secure do we need to be?

For each of these decisions, several factors need to be weighed including business impacts, employee impacts and importantly, cost implications.

Typically, IT recommendations and policy should flow from CIT, through IDTG and if necessary to EMT for final approval. City Council will retain responsibility for budget approval, is the final authority for municipal spending decisions and must approve City policies.

Policies and standards should establish the parameters within which the City uses technology and create clear expectations for those who use and manage technology. Conceptually, policies should balance empowerment with control. They should clearly define roles, responsibilities, and accountabilities.

The City has an existing IT policy framework that should be revisited and reviewed through the lens of the Vision and principles of this Digital Strategy.

A standard IT policy framework typically addresses the following areas.

- **Acceptable Use** – Provides the parameters, obligations and responsibilities associated with access to and use of City technology.
- **IT Security** – Defines how the City (as a whole) operates a secure and reliable technology environment, with adequate controls to protect the City's information assets.
- **Third Party Access** – Defines how third parties should access the City's network in a secure manner.
- **Backup, Recovery, Business Continuity and Disaster Recovery** – Defines the backup and recovery plans for computer systems that store City data. This policy is also designed to prevent the loss of City data and systems in the event of an equipment failure or destruction or security incident.
- **IT Procurement Processes** – Defines roles and responsibilities and processes for procuring technology solutions.
- **Asset Lifecycle Management** – Ensures effective procurement, maintenance and operation and replacement of IT Assets to ensure delivery of consistent, efficient, reliable, timely and cost-effective services for employees and the community.
- **Hosted and Cloud Solutions** – Defines the City's position with regard to Cloud computing and the due diligence required before procurement of Cloud solutions.
- **Data Management (Lifecycle, Privacy)** – Ensures that the corporation can effectively manage its data assets while complying with required legislation.

The CIT Director – with the input of staff and stakeholders across the organization and IDTG – should review, revise, and augment the corporate IT policy framework in the context of this Strategy to ensure that it accurately reflects how the City wishes to use and manage technology.

Policies will be developed with business unit and IDTG involvement, and approval will follow the standard corporate policy development process.

IT Architecture

IT architecture is one of the most important standards for the City and should guide decision-making moving forward.

At a high level, the MTM defines the core concepts and technological components underpinning what the City needs to deliver on its digital aspirations. The MTM represents a macro level blueprint – the equivalent of the City's Official Plan – but for the technology environment.

The MTM was introduced earlier in this document, however, one additional key architectural direction concept is "**build from the bottom up**".

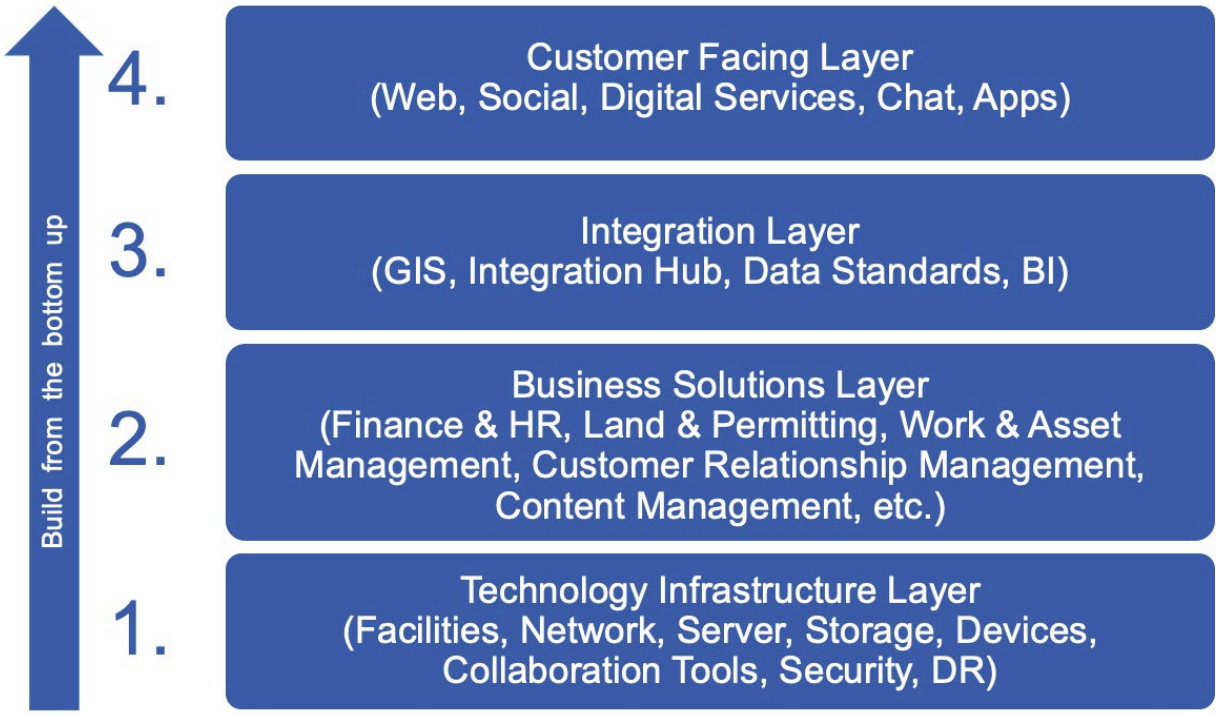

Figure 18: Municipal Technology Model

For example, you cannot implement a comprehensive HR system without the network connectivity and devices that allow staff to access and run the software. You cannot create a dashboard of employee performance data without a comprehensive HR system.

Documenting the Information and Technology Architecture

The City should adopt a pragmatic approach to architecture, informed by The Open Group Architecture Framework (TOGAF)[4] standards, but an approach that identifies "just enough" architecture to help decision-making without becoming an academic exercise.

Accordingly, it is recommended that the CIT Division select a number of priority areas to develop more detailed architectures and then define clear roadmaps detailing planned architectural change.

Recommendations for targeted areas include:

- Document existing technology standards (for RFP requirements).
- Document existing software development standards.
- Formally define enterprise platforms as:
  - SAP (HR and Financial business process management).

[4] The Open Group Architecture Framework – a commonly used architecture framework.

    - Hansen (Work and Asset Management process management) to be reviewed.
    - AMANDA (Land and Property-based process management).
    - ESRI GIS (spatial data management process management).
- Define Cloud Strategy, architecture and roadmap.
- Establish Identity Management standards (how users are identified, how the City will implement Single Sign On (SSO) between applications and systems).
- Define future collaboration platforms, architecture and roadmap (M365).
- Define core data standards.
    - People (employee, customer) to support CRM and ERP enhancements.
    - Property (address, street, service points) to support AMANDA and CRM projects.
- Develop Master Data Management programs to implement data standards.
- Define future Business Intelligence (BI) architecture.
- Define future customer service architecture (CRM / web / Identity Management / forms / data warehouse).

Architectural Team (AT) Process

The **who** of the AT was described above. This section describes the **how** and the **what**.

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

As part of the intake process, the CIT Division reviews proposals and ensures fit with the architecture. Where the CIT Director determines that a proposal falls outside the architecture, the City's standards or its IT principles (and the proposer is unwilling to alter its approach) the issue will be escalated for resolution at IDTG and, if necessary, to EMT, at which point, either an architectural exception will be made, or an alternative approach will need to be sought.

Significant revisions to the architecture will also be brought forward for approval by IDTG upon recommendation of the CIT Director or at the request of IDTG members.

IT Standards, Guidelines and Playbooks

In addition to the IT architecture, the City should develop guidelines (also known as playbooks) that help staff and management execute effectively.

The playbooks should codify how technology initiatives should be approached, allowing for the delegation and empowerment of project teams and staff. It will be the responsibility of the CIT Director and Managers in the CIT Division – with input from IT and business unit staff – to develop these playbooks. There are many good examples from other municipalities that the City will be able to re-use.

Examples of playbooks and guidelines that other municipalities have developed and that would benefit the City include:

- Tools for project teams.
    - Project management playbook – guidelines for projects, roles, responsibilities, activities and tasks, templates and resources.
    - Business process design playbook – guidelines, tools and templates for designing business processes, using customer journey mapping and other customer-centred design techniques.
    - Change management playbook (ADKAR[5] driven) – guidelines for effectively deploying a change management program in support of a business-technology project, again providing templates and resources for teams.
    - Project training playbook – guidelines for integrating and sustaining consistently high-quality training into projects.
    - Cloud playbook – guidelines, processes and steps required to procure a Cloud-based service.
- Tools for decision-makers and staff
    - IT Service Catalog – services and products that are available from IT, who they are available to, how they are accessed, priced, etc.

Documentation of IT technical standards are important tools to help the IT Team deliver its mandate and comply with policy directives.

IT documentation, though currently adequate where it exists, should be improved by the IT Team. The team should determine where the knowledge base will be managed. At minimum, standards for the following areas should be in place:

- Incident management.
- Change control process management.
- Backup and recovery.

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[5] ADKAR: Awareness, Desire, Knowledge, Ability, Reinforcement, Prosci. ADKAR is a goal-oriented change management model to guide individual and organizational change, created by Prosci founder Jeff Hiatt

- Problem management.
- Security management.
- Configuration management of critical systems.

4.2.3 Processes and Methods

One of the key areas for operational improvement at the City is in project selection and management.

More deliberately selecting technology projects – based on actual available capacity – will ensure a manageable workload, achievable goals and successful project outcomes.

Project Intake / Selection

Before a project can be approved, due diligence is required. Thus, a project should move through multiple stages before being approved for scheduling and execution.

A newly proposed Delivery Team within the CIT Division will be responsible for maintaining a register of all ideas and concepts alongside the technology project portfolio report shown later. This information will be made available live to IDTG members and staff.

The three stages of review – **Idea, Concept, Project** – are described in the following sections.

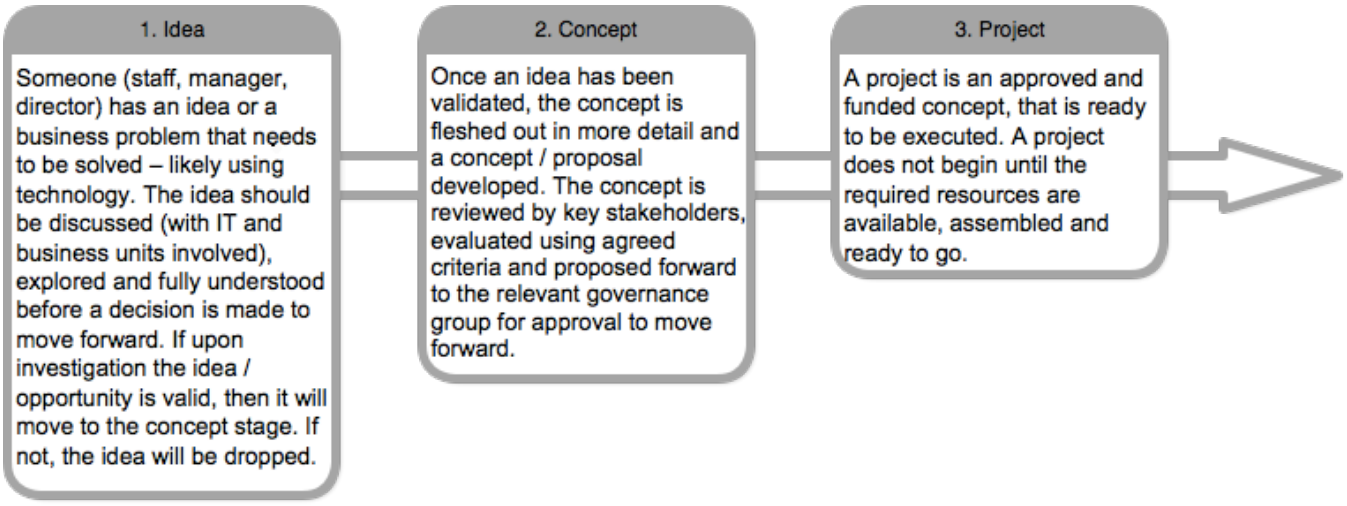


Figure 19: Idea – Concept – Project Process

The Idea Development Stage

The ***Idea*** part of the process is designed to ensure that project ideas are properly thought through before they become fully funded and committed projects.

It is unashamedly intended to slow the idea process down to ensure an appropriate degree of exploration and development. During this stage, a team of CIT and divisional staff will consider business needs, determine potential stakeholders, and consider options and implications of implementation.

The Concept Development Stage

If the *Idea* is deemed to be a valid opportunity to pursue, the team (CIT and divisional partnership(s)) proceeds to the ***Concept*** stage where a more detailed project proposal is developed.

Further research about approaches, solutions, resource demands and funding needs is conducted. Once the research is complete and the idea is more completely understood, a project proposal is prepared.

Projects deemed to be large projects will require a business case and resourcing plan to be prepared to accompany the project proposal. If appropriate, the relevant Program Committee should review the project proposal.

It is important to note that, in the past, availability of resources (in the business units and in CIT) has been the most significant impediment to the City's success in implementing initiatives. It is critical, therefore, to identify and secure the commitment of resources (department and IT staff, contract and secondment and backfill), at the GM level before a concept becomes a project.

The Delivery Team will work with the Project Sponsor to prepare an evaluation of the project proposal and rank according to the ranking scheme agreed by IDTG.

If funding is required as part of the annual capital project request process, all proposals will first need to be evaluated and ranked by the Delivery Team. The Delivery Team will also conduct a capacity management review (resource availability and/or needs) and make recommendations to IDTG on the project priorities.

IDTG will use this information to support its decisions about which proposals should go forward as part of the IT annual capital budget.

The Project Stage

Once a proposal has been approved (funded and resourced), a ***Project*** can be scheduled.

Note that approval and funding of a project does *not* mean that the project will begin immediately. The Delivery Team – working with the IDTG, CIT Director and stakeholders, will schedule projects in consideration of resource availability, dependencies and other factors.

Balancing the Portfolio: Run, Grow, Transform

Just as one balances an investment portfolio, the City should seek to balance its technology investment portfolio.

In the intake process, initiatives should be identified by the following categories:

- **Run** – Activities or investments required to keep existing City technology and business services running / operational.

  If IT budgets need to be trimmed, cuts should *not* come from Run initiatives.

- **Grow** – Activities or investments that provide for expansion of technology, additions to existing technology capabilities or service capabilities or to

accommodate growth of services.

Grow initiatives are usually not as mission critical as Run initiatives and often have some time flexibility, which makes them good candidates for starting early when funding is available or deferring when it's not.

- **Transform** – Activities or investments that involve major changes that introduce new organizational capabilities or fundamental changes to business processes and service delivery.

  When funding is limited, Transform initiatives are typically the first to be cut or deferred unless they are associated with key strategic initiatives. The City should, however, ensure that sufficient funds are allocated to the Transform category as these are the initiatives that will deliver high returns on investment and can significantly propel the organization forward.

This categorization is a useful guide for making key decisions around budget and project selection, and IDTG should establish and monitor target allocation across these investment categories.

Resource Management

To determine the capacity for technology projects, the City needs to better understand its currently available resources (in CIT and business units) as well as the project effort required for each proposal so that it can select a realistic and achievable number of projects.

This progression from the *Idea* to *Project* proposal stage is designed to provide project teams with more time to develop a thorough understanding of the project resource needs so that the resource needs can be more accurately estimated and planned for prior to project start, rather than hoped for after.

IT will implement a resource management system to record allocated and planned staff time on project and operational work. The value of this data will grow over time.

CIT 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.

As part of the City's annual Work Plan and budgeting process, Digital Delivery will be responsible for collating the proposed IT project resource needs (departmental and CIT staff) and matching this to available capacity.

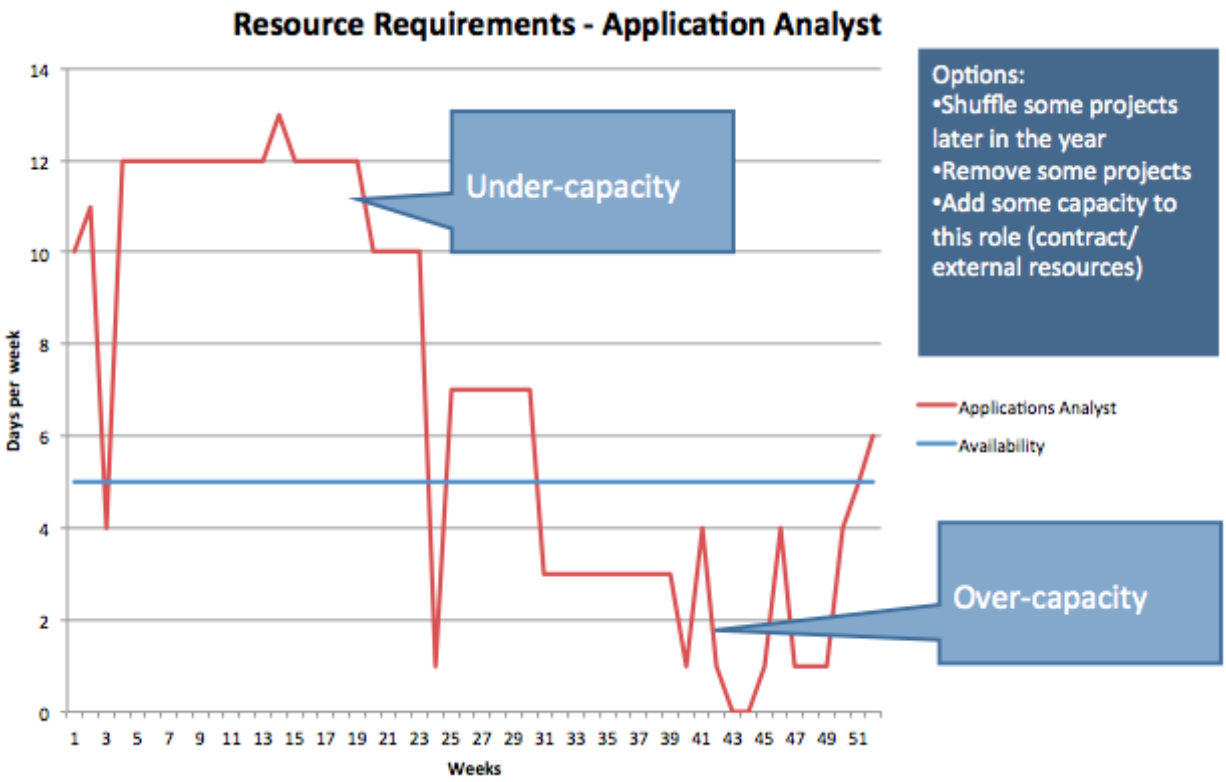


Figure 20: Sample Resource Management Activity

This information will be made available to IDTG to support the evaluation and scheduling of projects and the building of the annual IT capital project plan.

It may necessitate changes to the portfolio or additional funding required to cover additional short-term contract staffing needs to deliver the portfolio.

Project Execution

Selecting the right projects and ensuring that these projects have been carefully thought through is an important step in improving the City's success rate with its IT investments.

But it is only the first step.

Once selected, the projects must be executed successfully if the City is to realize the returns on its investments. Several factors are critical to project success, including:

- Strong project sponsorship and leadership commitment.
- Clear vision.
- A strong Project Manager.
- Sufficient resources dedicated to the project – subject matter, business analysis and technical expertise.
- An empowered project team that can make decisions / drive change.
- A focus on business processes and outcomes over technology implementation.

- A clear change management plan to ensure successful adoption.

Best practices recommend applying a proven project management methodology.

The City should adopt and apply a project management methodology to technology projects. The CIT Division should work with the Corporate Project Support Office to adopt a standard approach.

The Project Management Institute (PMI) PM Body of Knowledge (PMBOK) provides best practices that the City can adopt for its major projects.

This methodology, shown below, defines standard project phases, documentation requirements and checkpoints at the end of each stage to ensure the project is progressing satisfactorily.

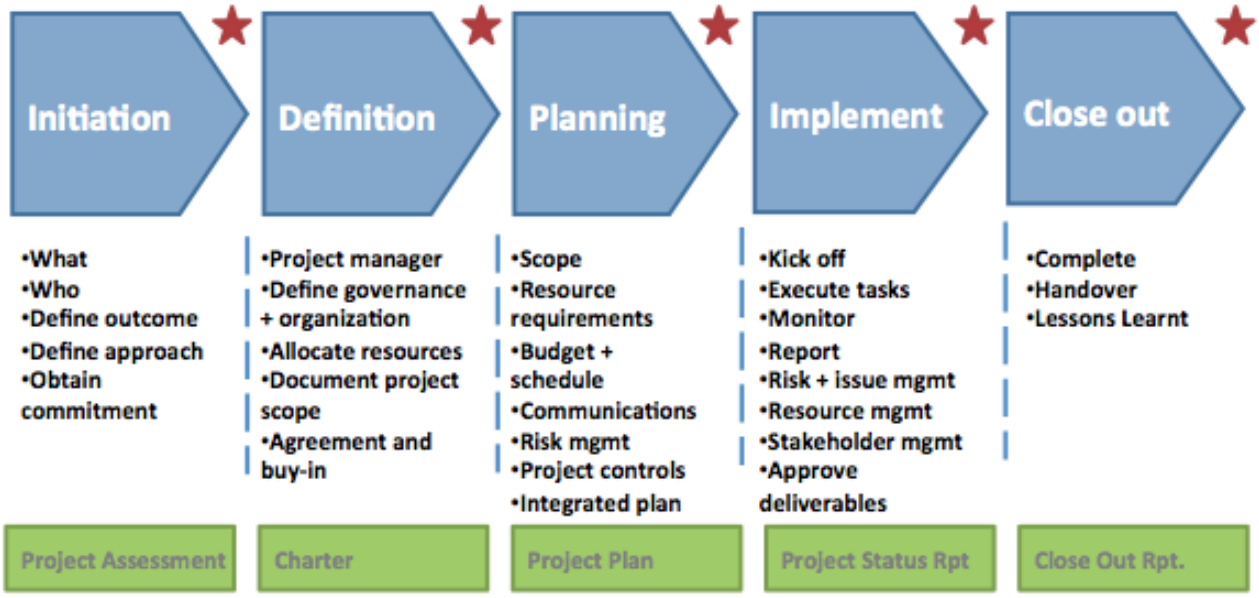


Figure 21: Sample Project Methodology Based on PMI Best Practices

The Delivery Team will play an important role in establishing and communicating the methodology throughout the organization and assisting IT and departmental staff in using the methodology to manage projects.

The Delivery Team should also carry out the project checkpoint reviews. These should be treated as a “helping hand” rather than an authoritarian checkpoint process.

For smaller projects, more agile project management techniques may be applied and the City will need to train some of its staff in these approaches.

4.2.4 Measurement and Reporting

Project Portfolio Reporting

The Delivery Team is responsible for reporting on the status of **all** technology portfolio projects (web, digital, GIS, business technology, technology infrastructure) in a way that provides visibility into the projects and provides CIT Management, stakeholders and IDTG with information that can help them intervene when necessary to keep projects on track.

A sample portfolio report is shown below:

			Project Key Performance Indicators						
Project Name	% Completion	Target Finish	Priority	Overall Status	Budget	Resources	Schedule	Scope	
PRM Phase 1	100%	30/06/2018	High		On Track	Sufficient	On Track	On Track	
Maximo evolution phase 1	50%	30/12/2017	High		On Track	Sufficient	On Track	On Track	
ActiveNet implementation	90%	30/09/2017	Medium		On Track	Sufficient	On Track	Off Track	
eScribe Implementation	20%	14/11/2017	High		On Track	Insufficient	At Risk	On Track	
Develop a GIS strategy	80%	21/03/2018	High		On Track	Sufficient	On Track	On Track	
Primary systems integrations	80%	21/12/2019	Low		On Track	Sufficient	On Track	On Track	
Establish Master Data Management strategy	60%	03/03/2018	Low		On Track	Sufficient	On Track	On Track	
Develop IT Risk Management Framework	20%	25/05/2018	Medium		On Track	Sufficient	On Track	On Track	
POS strategy & systems replacement	10%	30/10/2017	Low		At Risk	Sufficient	On Track	On Track	
Future Asset Management systems strategy	10%	30/03/2018	High		Over Budget	Sufficient	On Track	On Track	
Primary systems integrations	0%	21/12/2019	Low		On Track	Sufficient	On Track	On Track	
Establish Master Data Management strategy	100%	03/03/2018	Low		On Track	Sufficient	On Track	On Track	
Develop IT Risk Management Framework	20%	25/05/2018	Medium		On Track	Sufficient	On Track	On Track	
POS strategy & systems replacement	10%	30/10/2017	Low		At Risk	Sufficient	On Track	On Track	
Future Asset Management systems strategy	10%	30/03/2018	High		Over budget	Sufficient	On Track	On Track	
Enterprise Content Management (ECM) Strategy	0%	01/05/2018	High		On Track	Sufficient	On Track	On Track	

Note that this portfolio report only shows the active project view. Other views that show ideas, concepts and project proposals should also be put in place.

While the City can use Excel or SharePoint Online as a starting point for this reporting, it is expected that a project portfolio tracking tool will be required to support portfolio reporting in the medium-term.

As part of the regular review of the IT portfolio, IDTG should focus its review on:

- Prioritization changes.
- Review projects that have a red and yellow status.
- Projects due for completion.
- Projects due for startup.
- Any new unplanned proposals.

Strategy Success Measures

To monitor the execution of this Strategy, a range of success measures / metrics should be tracked and regularly reported to IDTG and Council.

While not all metrics will be available at the start, over the course of the execution of this Strategy the following measures should be established.

A Digital Strategy Performance Dashboard should be established to transparently share progress with all City staff.

Some areas of this performance dashboard are described below.

Digital Strategy

- Current digital maturity level vs. previous year (using Digital Maturity Assessment, could be self-assessed or independently assessed by a third party).
- Completion / in-progress / not-started reporting on Digital Strategy actions.
- Management and staff judgement / opinion about effectiveness of Information, Digital and Technology Governance (via survey).
- Management and staff digital awareness, confidence, comfort (via survey).
- Management and staff confidence in City's ability to deliver digital services and solutions (via survey).
- Average time for project execution from idea to completion.

Digital Workplace

- Ratio of laptop to desktop.
- % of all employees (FT, PT, seasonal) with a City account / access to City communications and collaboration tools.
- % of staff able to work from home.
- % of mobile working staff using technology to manage their day-to-day business processes.

- Annual hours per employee of technology / digital training.
- Number of digital meetings (MS Teams).

Digitized Business Processes

- Number of self-service internal digitized processes available.
- % of digital transactions vs. offline transactions for high-volume internal transactions.
- Number of services that require physical approvals vs. digital approvals.

Digital Infrastructure

- Number of public Wi-Fi sessions – Year/Quarter/Week vs. previous Y/Q/W.
- Multi-year civic facility connectivity.
- % of City's technology estate running Cloud/on-premise vs. previous year.
- # of regional partnership initiatives.

GIS, Data and Analytics

- Number of GIS self-serve solutions vs. previous year.
- Number of master datasets vs. previous year.
- Number of self-serve mapping requests served vs. previous year.
- Number of data literacy training sessions.

Digital Services

- Number of digital services offered by the City.
- Number of digital services that meet our digital standard.
- Number of new digital services this year/Q vs. previous year/Q.
- % of services offered by the City that are available digitally.
- % of digital transactions vs. offline transactions.
- % of digital payments vs. non-digital payments.
- Number of customer accounts.
- % of population with accounts.
- Regularly surveying customers to assess customer satisfaction with our digital services.

CIT Management Measures and Metrics

In addition to the Strategy success measures, a range of CIT Management metrics should also be tracked within CIT (and reported in summary to IDTG) to ensure that the IT service is functioning effectively.

Measures could include:

- Overall IT satisfaction rating (an annual IT survey should be conducted). Current satisfaction rating is below the 80% target. The City should set 85% satisfaction as an initial target.
- The percentage of projects that meet defined milestones / gates within +/-10% of budget and schedule. Results should be collected immediately and the target should be set after the first year.
- Training is a key focus area for the Strategy, therefore tracking and reporting on training hours received by IT and business staff will be important to assess the anticipated upswing in training hours.
- Given the levels of investment in IT, monitoring the IT investment situation is important. An annual calculation of the total cost of IT per employee is a good measure that will allow for ongoing comparison with other organizations.
- Annual comparison of the percentage of work that is Run, Grow, Transform.
- Service Requests.
    - Volumes / trends.
    - Performance against agreed targets and SLAs (which initially will be specific to the service desk).
    - User satisfaction.
- Change Requests.
    - Volumes / trends.
    - Exceptions.
    - Performance against agreed targets and SLAs.
- Asset status should be tracked, including:
    - Age.
    - Health status.
    - Investment by category.
    - Resource use by asset.
- Project portfolio delivery.
- Risk Register.
- Security incidents.
- Financial.
    - Macro indicators – total IT investment by FTE, cost per unit.
    - Micro indicators – budget vs. actuals.

- IT resources.
  - Availability.
  - Utilization.
  - Allocation.

A variety of dashboards can be used to present and visualize this information depending on the audience (see the Palo Alto sample below).

Annual Reporting to the Organization and Council

Building on these base metrics, the CIT Division should also share information 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 effectiveness of the organization. Council must be kept better informed about the overall roadmap and better educated on how specific initiatives will contribute to improved outcomes for customers and for departments.

The CIT Director, through IDTG, should provide an annual report to Council, highlighting cost savings and avoidances, new capabilities, capacities and new service offerings that have been facilitated by technology.

The figure below provides a sample dashboard highlighting IT measures and the data-driven dashboarding envisioned by this Strategy.

Figure 23: IT Value Report Sample

4.3 Technology Funding

To ensure that the City's services are *digitally-powered*, the City needs to make increased investments in technology.

To achieve the Vision presented in this Strategy, the Strategy must be backed with significant and sustained new investment in technology (to support and enable infrastructure upgrades, enhancements and new systems, review of Work Management and GIS systems, updates to AMANDA) and tools (to help the CIT Division manage the technology environment more effectively and proactively) and in permanent and project staffing, research tools and skills development.

The roadmap presented in the Organizing for Success section assumes funding for the initiatives it lists. If sufficient funding and resourcing are not allocated by the City, the Vision is likely to be unachievable and the initiatives identified within the Strategy will not be delivered in the timeframes identified or, in some cases, not at all.

4.3.1 Consolidate Technology Expenditure Oversight

It has been noted earlier and in previous reports that the City's spending on technology is below industry averages. The City should continue to monitor spending ratios (using MBN and other benchmarks). It is also noted that today, the City's technology budgets are somewhat distributed; most technology expenditure occurs in the CIT Division, but some occurs in departments.

It is recommended that IDTG takes on oversight of all technology expenditures and that the CIT Director work with Financial Services to conduct a review of City spending, tagging all technology expenditures to ensure that the total technology expenditures by the City is known and can be effectively monitored by IDTG going forward.

The City must ensure that the operating budget impacts of technology initiatives are more clearly identified and budgeted as part of capital requests for projects – particularly ongoing staffing requirements – to sustain implemented solutions.

Implementation should not proceed until the resources needed to support the operation of a solution after implementation can be committed.

The City must also work to establish a long-term lifecycle capital funding plan (10-20 years) for major technology components. For example, major platforms (SAP, AMANDA, Hansen, Microsoft 365) have a lifecycle (between 10-20 years), and the City should have funding plans in place to review and replace systems based on those timeframes.

4.3.2 Build ROI into Opportunity Intake Process

It is challenging to build a business case for the Digital Strategy as a whole, thus the Strategy does not attempt to present one.

As described throughout, the City lags behind its peers and many opportunities exist to close service gaps that other communities have already addressed. These are not “nice to have” features – they are standards that the City does not yet meet.

However, individual business cases can certainly be made for many of the proposed initiatives. Many of these business cases will focus on using technology to reduce processing times and improve customer service, to slow the need to add staff to deal with City growth and to eliminate manual or duplicated work.

The City should require technology projects to present a clear business case (as part of the intake process), with clearly defined value and costs before a decision to approve is taken.

4.3.3 Explore New Funding Sources for Technology

To facilitate the increased investment and ongoing support of technology, the City should also look to alternative funding sources outside of the traditional IT funding 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 on the organization to support and maintain that technology.

The City should continue to explore a range of alternative funding sources, successfully used by other municipalities to support technology investments. 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 and enable public Wi-Fi in City facilities.
- **Building Permit Reserve** – Used to directly fund permitting technology and indirectly fund upstream and downstream technologies and process improvements that contribute to an 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 for from the Fire budget, providing additional resources to support Fire but the resources are centrally managed and coordinated.
- **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 (e.g., through reduced plan printing and visits to City Hall).
- **Technology Levy –** Some municipalities have introduced a levy to fund investment in community technology, e.g., the Town of Caledon has introduced a "broadband levy" to address improved internet services in their community[6].

As the list above highlights, other municipalities are realizing positive new technology-powered outcomes for their residents while finding ways to fund them so that the solutions can be sustained.

4.3.4 Capital to Operating Cost Transition

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 and there is now no denying that this is the new business model.

This has the benefit to the City of lowering up-front capital investments in getting 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 IT operating expenses to increase significantly 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 all software expenditures will gradually transition to subscription and thus operating accounts over the next 5 years.

[6] https://www.caledon.ca/en/business/Internet.asp#broadband

5.0 Organizing for Success

The City must be positioned to deliver on the Strategy, otherwise the great ideas represented here will not be realized.

As the benchmarking presented earlier in the report indicated, the City is under-invested in IT and in IT staffing compared to peers.

The IT organization itself has not changed in size in over two decades. It should not, therefore, be surprising that there is a need to add resources to the team to support the delivery of the Digital Strategy, and a need to re-align the organizational structure.

Furthermore, as pointed out in the current state section above, there has been a lack of clarity regarding roles and responsibilities between the CIT Division and departments which has created confusion, duplication, and divergent strategic directions.

Both issues are significantly inhibiting the City's ability to innovate which, in turn, directly impacts service delivery and the City's ability to achieve *the best use of technology*.

As recommended by the PSR, this Strategy aims to resolve these issues and provide clarity regarding roles and responsibilities – identifying the **Who** of the Strategy.

5.1 Change in Approach

The whole Strategy outlines a new approach to technology – the Vision – the thinking about the role technology plays, which in turn dictates a new approach to technology management.

This should be characterized by the following:

5.1.1 Elevating IT in the Organization

The role of technology in 2021 is very different to that of the past. Information, data, technology and digital should underpin everything the City does going forward.

Thus, being effective at identifying, implementing, and embracing digital capabilities must become a strategic, core competency that the City must cultivate and develop.

As a result, it is not acceptable for service owners, managers, and staff to profess an ignorance or a disinterest in technology. Technology will increasingly become how services are delivered, and with a preference for digital delivery at the City, it is no longer optional to digitize services – it is a requirement.

Each service owner must work with CIT partners to get there.

As an organization, the City must develop its digital savviness and awareness across the organization, building a digital culture where technology and digital is recognized as being central to service delivery, efficiency and effectiveness.

5.1.2 Recommending a Centralized IT Approach

For some time, there has been some debate about what CIT's responsibilities should be, and what business units' responsibilities should be. Should technology resources be embedded into business units, or should they be based in CIT?

As noted earlier in the IT Operating Model section, without a formal model in place, an ad hoc and variable approach, department by department has led to a few technology resources operating outside of the CIT Division.

There are two predominant models of resourcing IT in organizations, along with variations thereof – a Centralized Model and a Decentralized Model. Each have their own pros and cons as outlined in the table below.

Table 6: Pros and Cons of Centralized and Decentralized Resourcing Models

	Pros	Cons
Centralized Approach	• Efficiency • Coordination • Standardization • Consolidation • Shared IT vision • Economies of scale • Cost controls/containment • Reduced redundancies • Management and staffing efficiencies	• Can be slower to deliver • Requires compromise across business units • Corporate service can be more distant from the business – lack of understanding of needs
Decentralized Approach	• Local decision-making • Promotes local innovation • Less bureaucracy • Focus on local priorities • Better knowledge of "the business" • Speed to solution – *illusion of speed* • Projects don't move at lowest common denominator pace	• Typically, more expensive to operate • Tools don't scale well • Standalone solutions • Overlap and duplication of technology and efforts • Lack of integration with enterprise solutions • Lack of documentation, testing, backup, DR, security

Each approach, and variations thereof, are suited to different scenarios and situations.

To be clear, the City does not formally operate either of these models today; instead, there is a grey area where there is variability between departments, divisions and teams and a lack of clarity.

In Thunder Bay's case, we believe that a centralized approach to core IT management is more suitable for the current state and goals laid out in this Strategy.

The chart below illustrates the consulting team's view that decentralization of technology services is well suited to situations where technology maturity is high, and where local innovation is a priority.

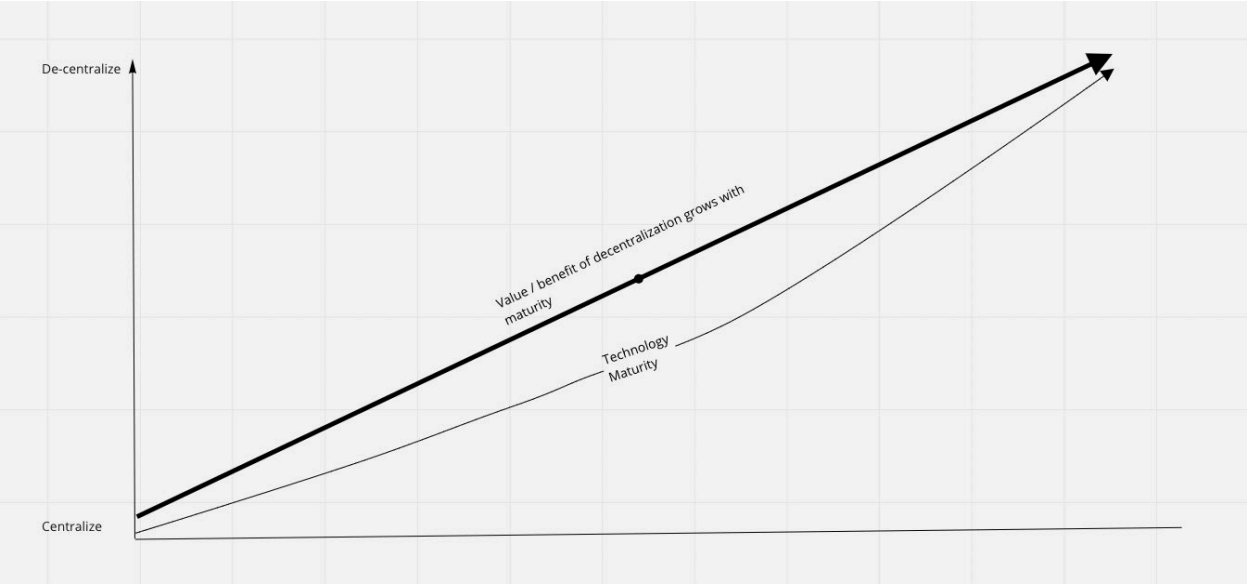


Figure 24: Decentralized – Benefits Grow with Maturity

The City's technology maturity is currently low and thus, a decentralized approach is *not* the right one.

Given the low level of IT and digital maturity at the City and the gaps in digitization of core business process, a more centralized approach that can focus resources on a smaller number of major platforms and can establish the corporate foundations is, in our view, the most appropriate and recommended model.

We acknowledge that this will sacrifice some local speed and innovation – but this is a required trade-off for a focus on high priority, high value corporate efforts that will have broad and far-reaching impacts on efficiency and service.

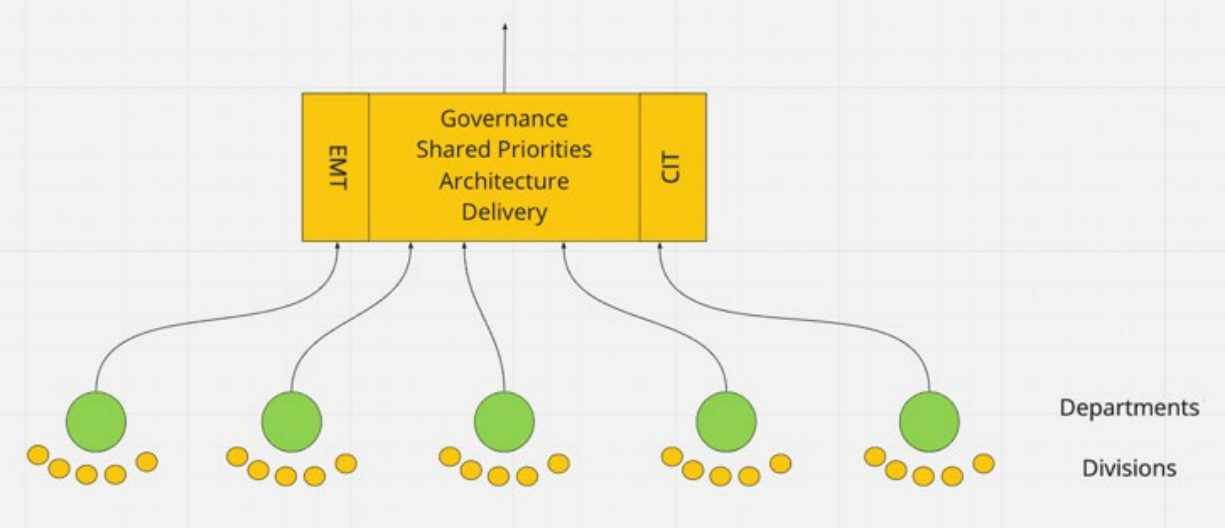


Figure 25: Centralized – More Focused for Less Technological Mature Organizations

Unequivocally, this Strategy recommends that a more centralized approach to IT resourcing is the most effective, efficient and right approach for an organization the size of Thunder Bay. Simply put, with the limited number of resources that Thunder Bay can allocate to technology, having them working together adds more value than working separately.

This should not be interpreted as meaning that departments, divisions, and teams should be any less involved in technology and business technology projects – in fact, the expectation, as we will discuss further in the next section, is to the contrary – that they will be more involved than ever.

5.1.3 Partnerships Between IT and Business Units

The CIT Division has been treated by a large part of the organization as a back-office, reactive, support function – a utility provider charged with keeping the lights on, or a supplier delivering widgets (in the form of projects handed to them).

A utility or supplier type relationship misses opportunities for both sides to learn from each other, to achieve the type of transformation envisaged, and to advance strategically.

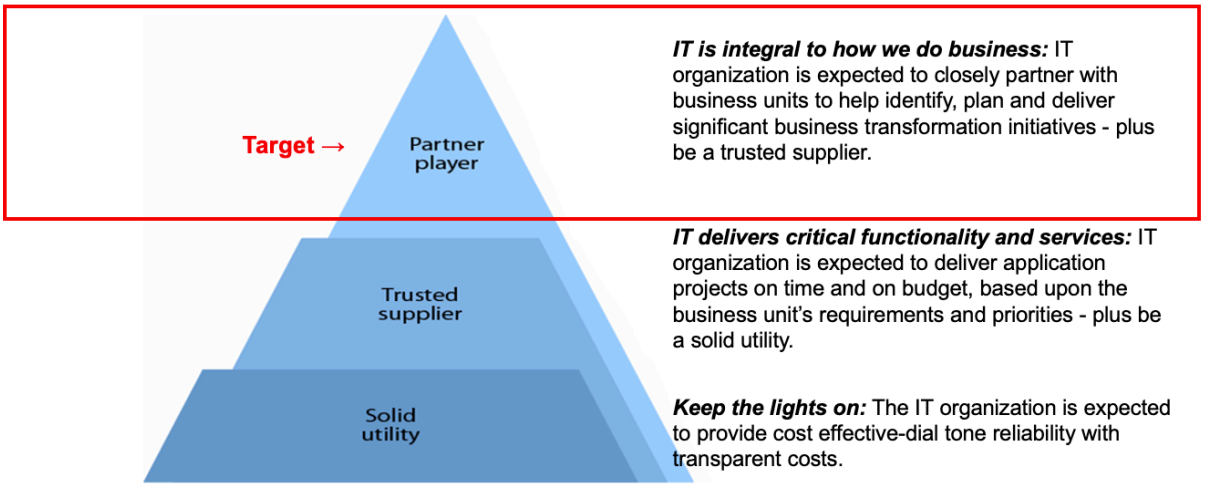


Figure 26: Elevating the Role of CIT

A more modern approach to the role of IT is to focus on building strong partnerships between IT and business units; where IT works hand-in-hand with business units to define and build modernized business processes and services, and where the CIT Division and the application of technology becomes an engine of change and transformation.

To build an effective partnership, IT and business units must both be at the table together in a collaborative mode with a clear understanding of roles and responsibilities. IT should be a partner in advising business units on technology strategy, helping to realize ideas and opportunities; business units should partner with IT by consulting and taking input and advice from IT.

CIT and business units should actively work on strengthening their relationships so that CIT better understands the business and vice versa. Of course, partnerships are built on trust so CIT must continue to deliver high-quality core IT services and business units must consult with CIT.

5.1.4 Stronger and Strategic IT Leadership

As a result of the growing importance of technology, IT cannot operate as a back-office support function.

Instead, IT needs to become a strategic function that has the power to transform service delivery to make experiences better for customers, to help staff be more efficient and effective and help the City do more with less.

Because of this, leading municipalities are recognizing the importance of technology and are elevating the role of IT in their organizations – with Chief Information Officers and Directors of IT becoming part of the Leadership Team with a mandate to drive digital innovation through their organizations.

The suggestion is for Thunder Bay to follow the same approach, with IT Leadership to have the authority and accountability to manage the strategies, working with the City's leaders in partnership with and through IDTG to achieve the Vision.

In addition, in new areas (such as project management, architecture, data analytics, business intelligence) and in existing areas where leadership was not previously focused (such as GIS) the CIT Division must step up, take stronger ownership, and drive these programs.

5.1.5 Increased Focus on High Value Activities

With the support of the Governance Framework, the intent is for the City's leaders and the CIT Division to identify those initiatives that will deliver the highest value to the organization and best align with corporate strategic goals and objectives.

The outcome will be that CIT will work on fewer projects than in the past. A smaller number perhaps, but those projects that are undertaken will be executed well and will deliver the desired outcomes.

5.1.6 Modernized Employee Experiences

The goal, as an employer of choice in the City, is to offer modern technology experiences to employees, providing the tools and technologies that make day-to-day interactions with colleagues, peers, customers and between divisions and departments easier and simpler.

It is with this intent that the new operating and organization model has been developed.

5.1.7 Increased Investment in Information, Technology and Digital Staffing

The recommendations made here are predicated on allocating increased resourcing to the CIT Division.

As identified in the MBN metrics comparisons above, and evidenced by the current state assessment, IT resourcing at the City is significantly below industry averages and significantly below where it needs to be to achieve the Vision articulated by the Strategy.

Increased investment in technology staffing is a must.

Based on the history of under-funded technology resourcing (particularly in areas such as Project Management, Architecture, Business Analysis, GIS and Data and Analytics) there are simply too many gaps in areas that are fundamental to the success of the Strategy – and these gaps must be addressed.

What is IT Architecture?

In the context of building a city, to effectively manage development and building and to ensure safe buildings that fit into local environments, the City puts in place:

Plans: Official Plan, secondary plans, zoning by-laws to guide development.

Requirements: Policies (e.g., minimum setbacks) and meets prescribed development standards (e.g., pipe materials and sizes).

Process: A process to go through for those proposing to build. The planning process ensures that the City can confirm its understanding of the proposal, that the community can provide feedback and to ensure that the proposal complies with the requirements set out.

The IT environment requires similar elements:

Plans: Digital Strategy, Information Management Strategy, GIS Strategy, systems and solutions roadmaps – these establish a broad understanding of trajectory and direction and a framework within which to consider new ideas and opportunities.

Requirements: Policies (e.g., security policy) standards and requirements (e.g., encryption, technology standards – SQL Server, etc.).

Process: The project intake process brings new ideas in through a single process and ensures that qualified City IT staff can review technology ideas and proposals to help align them with the City's chosen directions and to ensure that they meet the City's standards (e.g., data security requirements).

This collectively is known and referred to as "IT architecture".

5.2 New IT Organization Structure

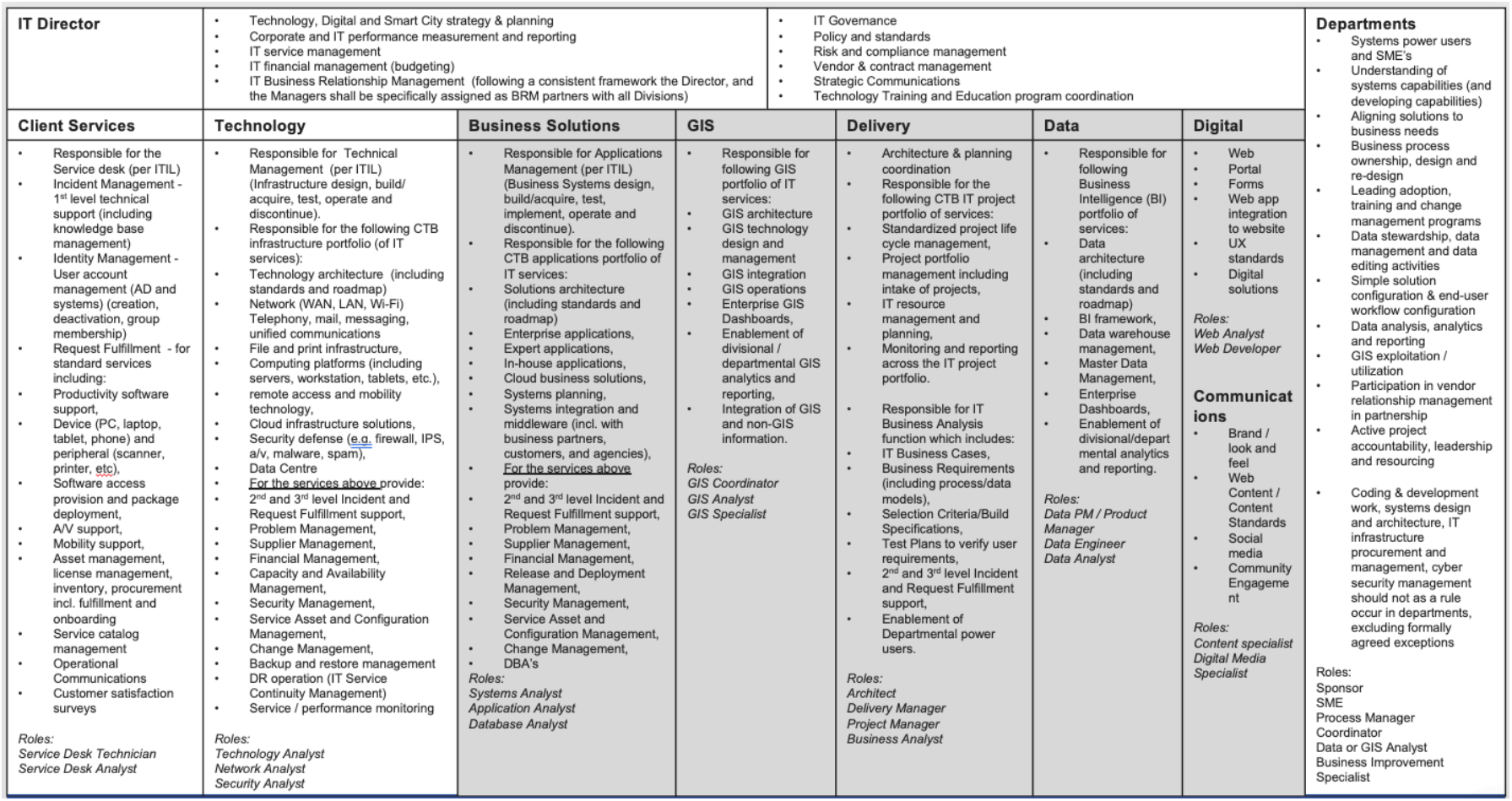
Following industry best practices (Information Technology Infrastructure Library (ITIL), COBIT), and addressing key gaps and organizational concerns, the functional organization structure identified in the Functional Model table shown below is recommended to better organize and align roles and responsibilities and better position the City to support the delivery of the Vision and Strategy.

The Current State Assessment identified that technology roles and responsibilities have not been sufficiently clear, leading to confusion and in some cases conflict.

Clear responsibilities – with a single point of accountability – underpins the City's broader organization design efforts and this core principle has guided the re-design and proposed re-organization of the City's IT resources.

The consulting team recommends that the City pursue a more centralized model for IT staffing at this time. A centralized model is recommended as a more effective approach, that allows resources to be more effectively coordinated and allocated to strategic goals and priorities under the direction of the previously mentioned IDTG.

5.2.1 Functional Model



IT Director							Departments
	• Technology, Digital and Smart City strategy & planning • Corporate and IT performance measurement and reporting • IT service management • IT financial management (budgeting) • IT Business Relationship Management (following a consistent framework the Director, and the Managers shall be specifically assigned as BRM partners with all Divisions)		• IT Governance • Policy and standards • Risk and compliance management • Vendor & contract management • Strategic Communications • Technology Training and Education program coordination				• Systems power users and SME's • Understanding of systems capabilities (and developing capabilities) • Aligning solutions to business needs • Business process ownership, design and re-design • Leading adoption, training and change management programs • Data stewardship, data management and data editing activities • Simple solution configuration & end-user workflow configuration • Data analysis, analytics and reporting • GIS exploitation / utilization • Participation in vendor relationship management in partnership • Active project accountability, leadership and resourcing • Coding & development work, systems design and architecture, IT infrastructure procurement and management, cyber security management should not as a rule occur in departments, excluding formally agreed exceptions
Client Services	**Technology**	**Business Solutions**	**GIS**	**Delivery**	**Data**	**Digital**	
• Responsible for the Service desk (per ITIL) • 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 catalog management • Operational Communications • Customer satisfaction surveys *Roles:* *Service Desk Technician* *Service Desk Analyst*	• Responsible for Technical Management (per ITIL) (Infrastructure design, build/ acquire, test, operate and discontinue). • Responsible for the following CTB infrastructure portfolio (of IT services): • 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 • For the services above provide: • 2nd and 3rd level Incident and Request Fulfillment support, • Problem Management, • Supplier Management, • Financial Management, • Capacity and Availability Management, • Security Management, • Service Asset and Configuration Management, • Change Management, • Backup and restore management • DR operation (IT Service Continuity Management) • Service / performance monitoring *Roles:* *Technology Analyst* *Network Analyst* *Security Analyst*	• Responsible for Applications Management (per ITIL) (Business Systems design, build/acquire, test, implement, operate and discontinue). • Responsible for the following CTB applications portfolio of IT services: • Solutions architecture (including standards and roadmap) • Enterprise applications, • Expert applications, • In-house applications, • Cloud business solutions, • Systems planning, • Systems integration and middleware (incl. with business partners, customers, and agencies), • For the services above provide: • 2nd and 3rd level Incident and Request Fulfillment support, • Problem Management, • Supplier Management, • Financial Management, • Release and Deployment Management, • Security Management, • Service Asset and Configuration Management, • Change Management, • DBA's *Roles:* *Systems Analyst* *Application Analyst* *Database Analyst*	• Responsible for following GIS portfolio of IT services: • GIS architecture • GIS technology design and management • GIS integration • GIS operations • Enterprise GIS Dashboards, • Enablement of divisional / departmental GIS analytics and reporting, • Integration of GIS and non-GIS information. *Roles:* *GIS Coordinator* *GIS Analyst* *GIS Specialist*	• Architecture & planning coordination • Responsible for the following CTB IT project portfolio of services: • Standardized project life cycle management, • Project portfolio management including intake of projects, • IT resource management and planning, • Monitoring and reporting across the IT project portfolio. • Responsible for IT Business Analysis function which includes: • IT Business Cases, • Business Requirements (including process/data models), • Selection Criteria/Build Specifications, • Test Plans to verify user requirements, • 2nd and 3rd level Incident and Request Fulfillment support, • Enablement of Departmental power users. *Roles:* *Architect* *Delivery Manager* *Project Manager* *Business Analyst*	• Responsible for following Business Intelligence (BI) portfolio of services: • Data architecture (including standards and roadmap) • BI framework, • Data warehouse management, • Master Data Management, • Enterprise Dashboards, • Enablement of divisional/departmental analytics and reporting. *Roles:* *Data PM / Product Manager* *Data Engineer* *Data Analyst*	• Web • Portal • Forms • Web app integration to website • UX standards • Digital solutions *Roles:* *Web Analyst* *Web Developer* **Communications** • Brand / look and feel • Web Content / Content Standards • Social media • Community Engagement *Roles:* *Content specialist* *Digital Media Specialist*	Roles: Sponsor SME Process Manager Coordinator Data or GIS Analyst Business Improvement Specialist

Figure 27: Functional Model to Organize and Align Roles and Responsibilities

In support of the functional model, the following represents the recommended role split between the CIT Division and departments.

Department Roles and Responsibilities

Departments need staff and management to:

- Be strong digital service owners, with intent to offer services built for the 21st century.
- Own business and operating models, business processes, their design and re-design.
- Be curious and open to change.
- Have a good knowledge of existing systems capabilities (and emerging / changing / growing capabilities and opportunities).
- Have a good knowledge of target process, data, systems, integration and technology architectures.
- Partner with CIT early to ideate, conceptualize and propose initiatives (new, changes to existing).
- Lead some projects (according to an agreed IT project methodology) and provide project status reporting.
- Bring active accountability, leadership and resourcing to digital initiatives.
- Bring strong, highly experienced subject matter expertise to digital initiatives.
- Work, in partnership with CIT as well as vendors and partners, to design and implement digital solutions.
- Lead adoption, training and change management programs of business specific solutions.
- Ensure systems power users and subject matter expertise is assigned and maintained.
- Conduct basic/simple solution configuration (e.g., drop downs, reports, data extracts, process steps and end user workflow configuration).
- Be effective data managers and stewards, to be responsible for data production and consumption activities.
- Conduct data analysis, analytics and reporting.
- Fully use and exploit GIS platform and GIS solutions.
- Actively participate in vendor relationship management in partnership with CIT.

Departments need to be aware that:

- User account management, architecture, coding and development work, systems integration, server-side configuration, hardware procurement and network design and/or management should not, as a rule, occur in departments,

excluding formally agreed – through IDT Governance – exceptions (e.g., SCADA). Note, this applies to all solutions and services that manage City data, regardless of hosting (Cloud, partner, on-premise).

- Technology solutions procurement should also not occur in departments without partnership and involvement of CIT in the process.
- All technology and services used by the City are subject to the same, consistent, corporately-defined security requirements and testing programs.

CIT Roles and Responsibilities

CIT need staff and management to:

- Advocate, evangelize and advise EMT and divisional leaders on digital opportunities and needed digital capabilities.
- Understand service owners' business goals, objectives and help business units identify needs, build business cases and fully realize their service improvement ambitions through technology.
- Work with the organization to govern the pipeline of opportunities and help the organization select investment opportunities that will have the largest impact.
- Provide project management guidelines and services to manage the delivery of digital service improvements in partnership with business units.
- Provide high-quality and effective IT support and assistance, enabling self-service for commoditized IT services.
- Manage core technology to be reliable, flexible and agile which is positioned to anticipate change and able to rapidly adjust to changing needs.
- Be open to change and evolution of technology needs and provide technology and capabilities that enable modern and efficient ways of working.
- Work with partners to develop clear standards, policies and guidelines that can enable quick and repeatable decision-making.
- Provide architecture, design and integration services to ensure systems and service integration.
- Work with partners to plan, implement, configure, integrate, upgrade and support business solutions.
- Lead and manage corporate GIS, data and digital programs.
- Implement and oversee suitable security programs for all City technology.

CIT needs to be aware that:

- Democratization of systems (e.g., GIS, teams, data and analytics, reporting, etc.) is a key objective so, where possible, we should be enabling staff in departments to do their work using tools without requiring CIT assistance or intervention.

- Business goals and objectives – along with business models, business processes and services – are owned by divisions and, specifically, service owners.
- Change management and training are the domain of departments for departmental systems – CIT is responsible for enterprise-wide systems change management and training (e.g., Microsoft 365).

5.2.2 Key Changes from Current State

The key changes envisioned include:

- Both CIT Division and non-IT department roles and responsibilities defining how they will partner to deliver technology.
- Clear internal delineation of roles and responsibilities with the CIT Division.
- Clearly-defined roles for departmental business unit staff, reflecting their lead role around championing change, owning and designing business processes and supporting change management and adoption.
- Increased emphasis and capacity within the CIT Division on project planning, portfolio management and delivery.
- Increased emphasis and capacity within the CIT Division on developing corporate data, analytics, and GIS capabilities.
- Increased emphasis and capacity within the CIT Division regarding architecture.
- A shift from a 3-unit structure to four functional units within the CIT Division, with the creation of a Delivery Team.
  This is important and has not been recommended lightly.
  We understand that the addition of functional units adds management but the CIT Division needs direction, coordination, and focus and this requires new functional units specifically focused on IT delivery.

5.3 Partnering of Departmental and IT Roles and Responsibilities

The critical and central role of management and staff in departments and divisions in the success of technology initiatives and business transformation cannot be overstated.

Service Owners own their service and delivery, in a digital fashion, is the responsibility of the Service Owner.

It is from business areas working in partnership with IT staff that innovative ideas and solutions to business problems emerge.

On business solution projects, the Vision, sponsorship, leadership, process design, change management and subject matter expertise can only come from the business units.

Consistent with the functional model, business process and business improvement specialists (as well as data and GIS analysts) should be expected to be in departments, whether in an innovation team or distributed across divisions. Many divisions will not have these roles in place and will need to rely on local staff or contracted resources.

Regardless of model, staff in departments and divisions will work on requirements and will, in turn, work closely with staff in the CIT Division, using the defined governance processes for project work that meets suitable thresholds.

Power users of business solutions, staff with non-technical operational duties who have developed expertise and experience with heavily-used business solutions, are also expected to operate in divisions or across divisions. They may provide support and training to staff and may carry out simple solution configuration work.

Furthermore, in areas such as GIS, data analytics, dashboards, digital forms and enterprise content management, the intent is for the CIT Division to provide tools that empower divisions to take advantage of technologies – without IT's involvement.

It is also recognized, expected, and encouraged that all divisions will hire smart, capable and tech savvy individuals into roles in their teams. These staff should be empowered to innovate but will be expected to work transparently and openly with their business partners in IT to align their work and to operate within the Governance Framework.

Deep technology expertise and work – around architecture, technology strategy, technology standards setting, project and portfolio management, business analysis, enterprise systems management, upgrades, integration, development and solution procurement – should be driven from the CIT Division. In accordance with audit best practices, administration of application security for business solutions (including on-premise and Cloud-based solutions) should be the responsibility of the CIT Division.

All existing roles – with some aspect of technology responsibilities that fall within the domain of IT in the functional organization chart (e.g., ERP team, web administrators) – should be reviewed and the relevant responsibilities and roles transferred to the CIT Division.

In future, for any new or re-designed job roles created by departments and divisions whose job descriptions include direct technology responsibilities (beyond the usual tech savviness requirements for new employees), it would be valuable to work with CIT to ensure that roles and responsibilities are clear and the operating model followed.

It is recommended that HR facilitate a review of such roles with the CIT Director to ensure that alignment to the functional model is maintained.

Under the business partnership model envisaged by the Strategy, it would be a recommended practice that when a department is recruiting to a role that involves or interacts with the technology division (e.g., a data analyst or a systems subject matter expert), that they would communicate with and involve CIT in the process, for example, by actively involving CIT Management in the recruitment process.

5.3.1 Governance Support for Partnership

Governance has been previously mentioned as being key to setting direction, monitoring progress, and evaluating outcomes.

Governance will also promote and manage the partnership between CIT and business units since it will provide cross-organizational oversight of technology activities, providing guidance and direction both to the CIT Division and to non-IT departments.

5.3.2 Project Partnership Model Example

In the partnership model and following the functional roles and responsibilities, there are clear roles and responsibilities set out for business units regarding technology.

In the example below (related to the Land and Property Management System (LPMS) implementation) the roles and responsibilities of the department and IT are shown.

This illustrates a consistent model that will be applied for all business technology projects going forward.

Table 7: Roles and Responsibilities of an IT Department

An Example: New Systems Project
Departments Provide: • Active Ownership and Project Sponsorship • Subject Matter Experts – seconded to the project to understand systems capabilities, review current and design future business processes • Testing and sign-off on functionality • Providing initial and ongoing training of staff on LPMS system and supporting adoption • Change Management – w/ focus on reinforcement + enforcement to ensure successful adoption

An Example: New Systems Project

IT Provides:

- Project Manager – dedicated to project, providing project leadership
- Business Analyst(s) – providing business analysis and business process analysis needs
- Application Analyst(s) – providing application configuration and integration needs
- Architect – reviewing and designing data and integration needs
- Change Management – providing frameworks and tools to assist business unit

5.4 Enterprise and Expert Systems and Associated Roles and Responsibilities

It is important to recognize that the City uses over 300 business systems today.

While the overall emphasis is on standardization and consolidation of those systems to as few as possible, there will always be departments with unique requirements, e.g., Cemetery Management (StoneOrchard) or Traffic Planning (TES), that will require specialist systems. Inevitably, there will always be a plethora of systems.

As it is impossible for the CIT Division to provide the same level of support to all these applications, systems are classified into two main types – enterprise and expert.

To assure efficient and appropriate levels of support for these two system types, the City should employ different CIT Division and department roles and responsibilities for each of these types, shifting some IT tasks to vendors as explained below.

5.4.1 Enterprise Systems

These systems have the following characteristics:

- Major top tier software **platforms**.
- Used across whole / most of the organization.
- Generic capabilities accommodate multiple lines of business and re-use.
- Highly configurable (data, workflow, validation).
- Significant integration requirements.
- API tools, query tools.

The City's enterprise systems are expected to include (note that several enterprise systems are not yet in place, indicated with "TBD" below):

- SAP – Enterprise Resource Planning
- ESRI – GIS
- Hansen – Work and Asset Management (to be reviewed)

- AMANDA – LPMS
- eSolutions – Web and Digital Platform
- TBD – Business Intelligence and Data Platform
- TBD – CRM
- TBD – ECM

The CIT Division plays a stronger lead role for these systems by:

- Functioning in partnership with the business leads for implementation and utilization of enterprise-wide capabilities.
- Fully supporting and evolving the solution to meet corporate needs.
- Managing vendor relationships.

5.4.2 Expert Systems

These systems have the following characteristics:

- Specialized solutions.
- Targeted for specific industry.
- Use limited to teams and workgroups, though role may be critical to the organization (e.g., Tax).
- Typically, fewer enterprise integration requirements or options.
- Fewer generic and configurable capabilities.

Examples of these systems include:

- Firehouse.
- StoneOrchard.
- iMedic.
- Medicare.
- Vailtech.

The CIT Division typically plays a reduced role regarding these systems by:

- Working with business units to assist in procurement (in line with architecture and standards) and ensuring suitable support is put in place as part of the procurement.
- Supporting the installation of software and ensuring environment is correctly configured for operation.
- Supporting integration requirements as necessary.
- Coordinating, as necessary, with departments that work with vendors to support the solution.

- Possibly negotiating a higher level of support based on the critical nature of the solution (e.g., Tax system).

5.5 Technology Training Model

The lack of attention to technology training and clear allocation of responsibilities was reflected in staff survey results, which indicated dissatisfaction with the technology training offerings.

At this time, accountability for technology training is not as clear as it should be and there are limited resources specifically allocated to it.

It is recommended that the following roles and responsibilities regarding training be followed.

Table 8: Roles and Responsibilities Training

Area	Description	Role / Responsibility
Corporate training needs	The development of a corporate technology training requirements analysis, identifying training needs across the organization.	CIT Director
Technology training program design and development	Development of a training program informed by corporate training needs requirements reflecting the delivery preferences of staff, e.g., Lynda.com, offline, self-study, lunch and learns.	CIT Director
Corporate Training – Standard Productivity Suites	Coordination and delivery of training around productivity suites, e.g., Office, Adobe.	Coordinated by HR in partnership with CIT as part of corporate training program
New technology product	Coordination and delivery of training around new solutions.	Coordinated by project team, following training delivery standard
Business Systems 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.

The City should procure / develop a digital education program for organizational leaders and management group designed to help leaders understand the value to be gained from the digital world and how to take advantage of the opportunities it presents in the context of the enterprise.

This may be a good opportunity to work with regional partners.

5.6 Future Information and Technology Staffing Needs

To support the adoption of the Strategy and the implementation of the recommended IT organization structure, a series of changes to existing roles are anticipated with new job descriptions and new reporting relationships within the CIT Division.

Organizational recommendations that identify recommended changes – including realignment of some roles – have been separately provided to the City by the consulting team.

As noted earlier, while there have been fluctuations over the years, the City's CIT Division is the same size as it was two decades ago. There are, as a result, requirements for new staff positions within the CIT Division that simply cannot be deferred or ignored.

One key area of focus, at least initially, is establishing the project delivery engine in CIT so that initiatives and projects that are selected can be executed effectively and can achieve the outcomes anticipated.

5.6.1 Short-Term CIT Staff Needs (Within 1 Year)

The following roles are recommended by the consulting team as priority positions for the City in the short-term.

- **Manager, Delivery** – Accountable for Projects, Resource Management, Architecture, Governance, and common project services.
- **GIS and Data Coordinator** – Accountable for all data and GIS standards, tools, and common data services and a recommendation of the recently completed GIS Strategy.
- **Project Manager(s) / Business Analyst(s) –** A combined role accountable for opportunity analysis, business cases and management of program projects. At minimum, 1 permanent position must be added to CIT in the short-term. Others may be added on contract as needed to assist in the delivery of projects.

These roles will support and enable the delivery of 2022 projects as identified in the Roadmap section. A combination of internal FTE reallocations and operational or capital business cases will be required to fund these roles in 2022.

5.6.2 Mid-Term Information and Technology Staff Needs (1-2 Years)

In the medium-term, the consulting team recommends the following role additions to CIT.

- **Project Manager(s) / Business Analyst(s)** – In the medium-term, at minimum, the City should aim to add two permanent positions in the PM/BA role. Others may be added on contract as needed to assist in the delivery of projects.
- **Application Developer / Analyst(s)** – Accountable for setup, configuration, evolution, integration and support of the City's core systems. At minimum, the City requires two new positions to support digital and business solutions work ahead.

These positions are required to support the delivery of projects identified in 2023 and beyond.

The CIT Director, working with IDTG, should develop a business case and supporting budget requests to address these requirements.

5.6.3 Longer-Term Information and Technology Staff Needs (2-4 Years)

In the longer-term, the consulting team recommends the following role additions to CIT:

- **Data Engineer** – In the longer-term, as the City focuses on data and analytics, additional specialist resources will be required in this domain.
- **Project Manager(s) / Business Analyst(s)** – In the longer-term, at minimum, the City should aim to have three additional permanent positions in the PM/BA role. Others may be added on contract as needed to assist in the delivery of projects.

These positions are required to support the delivery of projects identified in 2024 and beyond. The CIT Director, working through IDTG, should develop the requisite business case and supporting budget requests to address these requirements.

While role additions to CIT may seem significant – extravagant even – remember that there has been 20 years of *no change* to resourcing levels in CIT. There is a lot of catching up to do.

Note also that several other positions identified and suggested by the consulting team – including recommendations for additional change management and training staff, additional GIS and business solutions positions, digital specialists and data experts – have been rejected by City management to minimize the number of positions that must be added.

5.7 Future Departmental Business Unit Staffing Needs

In addition to the CIT Division changes recommended, departmental business unit staffing also needs to change to adopt the Strategy recommended, to operationalize the functional responsibilities articulated in the Functional Model section and to lead the charge to digitize their business services.

Transformation projects will require the allocation and dedication of business unit staff to projects to make them successful. Like CIT, seconding, backfilling, and contracting will be strategies that will need to be funded to enable divisions to resource projects for successful execution.

As well, and as discussed in the High-Level Summary of the IT and Digital Management State section, it is expected that departments and divisions will need to develop skills and capabilities in the following areas:

- Digital and technology awareness and savviness.
- Systems knowledge and understanding.
- Service design, business process design and business improvement.
- Training, adoption and change management.
- Data analysis.
- GIS use and application.

Some departments have already begun to develop and nurture these skills – others have not yet and will need to develop these skills as projects and initiatives arise that require them.

As departments and divisions review and revise job descriptions, they may have the opportunity to consider how to develop these capabilities within their teams.

It is important to note that Subject Matter Experts and departmental power users are critical to the delivery of business technology projects. They should actively be involved in and seconded to major projects to help design future processes, drive change and ensure successful adoption of solutions.

5.8 Alternative Resourcing Strategies

Ramping up capacity to deliver digital transformation will be critical, however, permanent internal staffing is only one part of the story.

The reality of modern IT – particularly in municipalities – is that it is simply impractical to maintain in-house all the skills and capacity needed to plan, implement and manage the City's increasingly complex technical environment and burgeoning project demands.

To do so would be unaffordable or, in the case of a short-term need, a bad business decision.

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 and service providers to deliver the required services.

Just as the City approaches road building and road maintenance – contracting engineering and construction firms with road design and building expertise – in some situations, IT can adopt the same approach with the emphasis 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. It means that the CIT Division, the CIT Director and CIT Managers, act as coordinators or orchestrators of IT service delivery, executed by a combination of internal and external providers.

The City's goal should be 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. Some of these same approaches can also be applied to filling resource gaps in business units.

5.8.1 Capital Funding Contract Staff Positions

All evidence and studies indicate that projects are more successful when staff can be dedicated to the project.

To achieve this level of dedicated attention to projects, municipalities commonly use contracting for short-term staff (6 month, 1, 2 or 3-year contracts).

Costs for staffing contracts are "bundled" into the total capital cost of the project and capitalized so, when projects are approved, the appropriate staffing is also approved.

Contracted staff needs may include technology resources such as a Project Manager, Business Analyst(s), Application Analyst(s), as well as business unit staffing to provide subject matter expertise from departments to drive and support project delivery.

Taking advantage of the City's new found ability to work remotely means that the City can seek staff with expertise from across Canada – not just locally.

Contracted staff may be used directly on the project but are more often used to backfill Subject Matter Experts in business units or IT, thus freeing up expert and experienced internal staff to work on projects.

For example, a contract Traffic Engineer may be brought into the City on a one-year contract to free one of the City's current Traffic Engineering staff to work on the Traffic Management System project.

This allows the City to retain the accrued project learning and expertise when the project is complete and to offer development opportunities to internal staff.

5.8.2 Vendor of Record (VOR) – IT Resources On-Demand

Because of the regular need to bring in additional resources to support project activity, numerous municipalities (e.g., Richmond Hill, Guelph, Mississauga, Hamilton, Peel) have embraced a VOR or Roster model.

In this approach, the City would have an arrangement with one or more firms that can supply experienced Project Managers, Business Analysts, network or security specialists, GIS experts, AMANDA specialists, and other technical resources to the City, on-demand at pre-set rates.

At Richmond Hill, their arrangement with Deloitte allowed them to access Finance, Procurement, HR and other business specialists from Deloitte to support their business unit resourcing of projects. As noted in this example, this approach may not be confined to technology resources. At Guelph, their Roster model has seen them sign pre-qualified master agreements with 4 vendors that can supply AMANDA configuration services. Now, when a need arises, within a week the City can issue a Statement of Work (SOW) and select a partner to work on the project with City staff.

Funding for VOR resources are also included as part of a project capital request and having a VOR in place can enable the City to quickly ramp up resources to lead major projects such as LPMS, Work Management and CRM.

5.8.3 Service Providers: Out-Task Some IT Services

As the City's technology needs grow, as the City becomes more mobile, as security threats grow exponentially, with the work needed in and around technology architecture and with the growth in Smart City activities, pressure on the Infrastructure Team will grow significantly.

The City has great strength in this team today but the team is already challenged with volume and will become overwhelmed with work if the City isn't smart about how it handles the allocation of work.

Of course, some of the City's IT systems are tailored to a specific municipal line of business, however, many technologies run by the City (such as networks, servers, file storage and email) are more generic.

As hospitals, construction firms, banks and other organizations have come to use the same systems, these areas of IT have become more commoditized. In areas of commoditized service provision, because of their scale, expert service providers in the marketplace can be more cost-effective than internally managing the service. In some situations, using a managed service provider can be attractive to organizations that need to free up internal staff to use their strong knowledge of the City to work on projects.

So, the City can use out-tasking as a strategic approach that trades off low value activities for higher value work, which has more strategic value to the organization, such as architecture, strategy, integration, mobility, project implementation activities.

A few examples:

- Some municipalities have out-tasked device provisioning and hardware maintenance (e.g., the City already does this for printers; others are doing this for telephony services, device provisioning). These external services are used to augment the existing IT resource base.
- The use of hosted or Cloud-based services can out-task many of the infrastructure management activities that would be required for an on-premise solution thus freeing staff to focus on integration, security testing and contract management.
- The City may lack the dedicated expertise or resources to manage a service as effectively as needed by the City. One good example of this is around

specialized security services. These services can also be purchased on an “as needed” basis or – as is becoming more prevalent – as a managed service from outside firms. The City is still receiving the same (or perhaps a higher) level of service, but City IT staff are available to work on other activities. Of course, there is a cost implication here – external services have a cost, but the cost is often less than fully resourcing a function.

Success in the domain of out-tasking, depends on continuous development of City staff skills to enable them to move to value-added activities and effective selection and management of providers, ensuring that contracts are well structured to protect the interests of the City.

Contract and SLA management, for example, would become an area in which the City must develop new skills.

5.8.4 Use External Expertise to Plan, Design and Set Strategies

Setting strategies before tackling projects is critically important to successful outcomes – 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.

Such plans will maximize value for the City over the long-term.

5.8.5 Leverage Strategic Partnerships

Although the CIT Division can design and build great solutions, it doesn’t always mean that it’s the right or best approach.

Looking forward, more strategic decisions will be needed to determine if the City is equipped to build and deliver a good solution or whether another partner (in the public or private sector) is better suited to address a need.

Public Wi-Fi is a good example of this, with different municipalities taking different approaches and using partnership models. Some municipalities have built and support these public networks.

In contrast, Mississauga has partnered with Sheridan College, due to their expertise in providing Wi-Fi to 21,000 students. Sheridan provides and supports the public 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, deep expertise have resulted in a superior service for citizens, while City IT resources are able to focus on other areas better suited to their core competencies.

Through Tbaytel, Thunder Bay is in a similar situation to Burlington – able to work with and through a partner to achieve beneficial outcomes for the community.

Given the pressures on IT resources, looking forward, the City should think strategically around other opportunities for partnership as it considers technology opportunities.

In the region, there are a range of potential partners to explore working with more closely, including:

- Tbaytel.
- Synergy North.
- Thunder Bay Libraries.
- Regional Hospital Network.
- Local School Boards.

Working with potential partners in the region to enable piggybacking on purchases, to explore opportunities for joint or shared project implementations, to share resources or run joint training opportunities, to work jointly on digital education programs are all good examples of how the City can gain significant value through strategic partnership.

With a clear description of the who and how, what projects and solutions does the City need to work on?

6.0 Major Initiatives

The following section outlines the **what** of the Strategy – the major projects that are recommended.[7]

The work ahead is broken into the following five workstreams:

1. **Digital Workplace** – Connecting all staff, using technology to make staff working lives simpler and easier.
2. **Digitized Business Processes** – Replacing paper-based, manual processes with automated, digital, real-time, workflow-based processes.
3. **Digital Infrastructure** – Ensuring we have the connectivity, Cloud capabilities and cybersecurity to support the City and our community.
4. **GIS Data and Analytics** – Managing data well and using it to drive our practices and decision-making.
5. **Digital Services** – Providing great, self-serve, digital experiences to customers over visits or calls to City Hall.

These are the areas in which we recommend the City focus its digital and technology investments.

6.1 Digital Workplace

Connecting all staff, using technology to make staff working lives simpler and easier.

6.1.1 Microsoft 365 Implementation

The City is already in the process of upgrading to Microsoft 365 – Microsoft's next generation, Cloud-based collaboration and productivity suite.

For the City, this will mean more broadly deploying MS Teams, migrating email inboxes and calendars to the Cloud for greater resiliency and performance, providing access to staff to new tools for planning and tracking work and tasks, using SharePoint Online and OneDrive to support real-time collaboration, and enabling mobile access to documents and files.

The migration will take a couple of years – as the City must gradually move to a subscription model for licensing – but this move will create a long-term foundation for more flexible and collaborative work inside the City and with partners outside.

[7] There are more initiatives that the Digital Strategy has identified that are not discussed in detail here. A more complete work plan that includes smaller activities and initiatives has been supplied directly to City staff.

6.1.2 Information Management Strategy and Enterprise Document and Records Management System

The City must modernize its corporate records management (classification, retention, destruction) approach and align its paper and electronic records management practices. An enterprise records management systems project has been planned and partially budgeted for a few years.

While technology will be an important part of making it easier and simpler to find, access and retain critical content, the right strategy, policies, practices and protocols must be in place before implementation to ensure that the City sets up the environment correctly.

As a result, the City plans to develop a Corporate Information Management Strategy that will review the City's current information management practices, set the trajectory, evaluate solution options and provide a clear roadmap and implementation plan for implementing electronic records management and for improving records management practices.

Once the strategy is set, the City will proceed to implement a corporate document and records management system – re-using, where possible, existing technologies (such as Microsoft SharePoint and OneDrive).

6.1.3 Device Review

In the quest to provide a flexible working environment that meets the needs of staff and management, the City plans to conduct a review of the devices that it provides and determine the most effective options – for smartphones, tablets, laptops, and desktops.

Many municipalities have moved to a primarily laptop fleet and/or offered managers and staff choices of the devices that they can use – this is known as the Choose Your Own Device (CYOD) model. The City will evaluate its options and determine what approaches it will use.

A major device replacement program (based on lifecycle) is planned and budgeted for 2023, and so this device review should be completed ahead of this work.

6.1.4 Connecting All Staff

While the City has long focused on providing IT services to City staff in offices, those who don't work in the office, have less access.

Of course, some mobile City staff are issued mobile devices, but many do not receive a device. For those staff who do not work primarily in an office – e.g., paramedics, transit operators, childcare and long-term care staff – it is challenging for the City to get messages out and staff can feel disconnected. Digital communications is forming a more and more important part of any staff Communications Strategy.

As the City becomes more digital and offers new digitally-powered self-service capabilities (timesheets, shift management), providing options that allow *all* staff to access IT resources and self-serve services will become more important.

As a result, the City will evaluate options and approaches to connect those staff to City technology. The City may also want to consider Bring Your Own Device (BYOD) options for staff who are not issued devices.

6.1.5 Expanded IT Support Service

As the City's dependence on technology for service delivery continues to grow – just think about online recreation program registration, mobile work management and mobile building inspectors and enforcement officers – the demand for technology support is expected to continue to grow and grow.

Furthermore, for many service areas, such as Fire, EMS, water and wastewater, support is not just needed during office hours (8:30-430) as the current IT support service is provided but may need to become 24x7x365 or an extended hours service that provides service 7:00am-9.00pm.

A review of out-of-hours IT service needs should be conducted, and options brought forward by the CIT Director to IDTG for consideration.

A suitable option must be selected and implemented.

6.2 Digitized Business Processes

Replacing paper-based, manual processes with automated, digital, real-time, workflow-based processes – with a focus on the City's core business processes.

6.2.1 Asset and Work Management Systems

Asset Management is one of the City's strategic priorities – under the renew banner. The City's asset and work management systems go-forward strategy and path is unclear today.

There are numerous systems in use and there are some questions about whether the City's main Work and Asset Management System (Infor/Hansen) can meet the City's current and future requirements.

At the same time, there are pressing requirements to collect asset information and condition data to meet asset management reporting deadlines, as well as a need to mobilize field staff.

It is recommended that the City implement a series of short-term or interim solutions to support its immediate needs – utilizing GIS and existing solutions in use at the City.

Then, working through the proposed collaborative governance model discussed earlier in this report, and specifically through the Work and Asset Management Systems Coordinating Group, the City should conduct a review of its Asset and Work Management Systems, establish a fulsome understanding of needs, define a target architecture and determine a suitable path forward to establish a robust, integrated and comprehensive set of solutions that leverage GIS, back-office process automation and mobile capabilities.

Once the roadmap is mapped out, it should proceed through the intake process to be budgeted, resourced, and executed.

6.2.2 Land and Property Management Systems (AMANDA)

Growth is another of the City's strategic priorities that the Digital Strategy directly supports.

As part of the consultation process to develop this Strategy, the consulting team and staff from the City's Planning, Building and CIT Divisions met with the development and building community. Representatives indicated a clear desire to interact with the City in a more digital manner, a call also echoed by the Thunder Bay Chamber of Commerce.

So, it is recommended that the City plan to expand its use of the AMANDA system to fully digitize the planning, building, permitting, licensing and enforcement processes.

This work should start with Building and Enforcement and should include:

- Digitizing back-office processes and enabling digital plans review.
- Enabling online interactions with customers allowing them to apply and pay for services online, book an inspection or report a problem, and
- Equipping mobile staff with technology that is connected to back-office systems so that they can conduct and record inspections in real-time on their mobile devices.

Enforcement and building processes will be the initial priorities – as the areas where the most significant transaction volumes exist – before attention turns to other development processes.

6.2.3 SAP Multi-Year Plan, Upgrade and Finance Enhancements

The City has long operated the SAP system as its core financial system. SAP is a robust, comprehensive platform that is widely used by municipalities across Ontario (including Barrie, Cambridge, Kitchener, Pickering, Peterborough) and one which the City should double down on.

"People and Money" processes are core processes that form the backbone of any organization. The City's ERP is one of the keys to offering staff a more digitized self-service model with the potential to offer online paystubs, time reporting, leave requests, expense claims, requisitions, among many other things. So, having a robust and evolved ERP is central to delivering a more digital staff experience.

An upgrade is required to the City's SAP environment, which is planned and budgeted for in 2023. Before then, in 2022, the City should plan to develop a multi-year SAP roadmap identifying major initiatives and priorities for the coming years.

City staff should work collaboratively through the recommended "People and Money" working group, with external consulting assistance, to determine what enhancements should be considered as part of the upgrade and to map out the longer-term roadmap for SAP enhancements.

6.2.4 Comprehensive HR Process Management System

One of the City's most important assets are its people; they also represent one of the largest costs, so it is critical to effectively manage the workforce from onboarding to retirement using digital processes rather than paper-based employee files.

The City's current employee records are largely paper-based or tracked in numerous spreadsheets. HR processes such as recruitment and training tracking must be modernized. Existing process management is extremely time consuming, inefficient and prone to error and the management of data related to processes consumes much HR staff time.

It is important to note that this is a drag on the whole organization – something that inhibits organizational flexibility and agility and that doesn't provide management with the insights that a more comprehensive and effective HR solution could.

A comprehensive HR management system is a corporate-wide solution, not simply a "system for HR", and thus must meet the needs of the whole organization (leadership, management, staff (part-time, full-time)).

A new HR management system, based on SAP is required.

Implementation of such a solution will likely address the following needs and capabilities:

- Position management.
- Employee records.
- People metrics and analytics.
- License and training tracking.
- Time and attendance.
- Shift scheduling.
- Applicant tracking and online recruiting.
- Learning management.
- Succession planning.
- Performance management.
- Absence management.
- Employee self-service.
- Health and safety.

We recommend that consideration also be given to historic data digitization and the need to load prior employment history and records into the system, prior to go-live.

This work is dependent upon the SAP roadmap identified above and thus, some interim solutions may be required until a more comprehensive solution can be tackled in 2023. Specifically, interim improvements to the shift scheduling and recruitment processes are anticipated in 2022.

6.2.5 Water and Tax Billing Replacements

The City's Water Billing and Tax Management systems are planned for replacement as both have reached end-of-life.

In practice, these are two separate initiatives.

Each of these initiatives is designed to replace existing back-office systems that manage billing processes, while also introducing online portals allowing customers to self-manage their services, monitor usage and set up billing arrangements.

6.2.6 CRM System

The City plans to undertake a customer service review and it is likely that the review will, among other things, indicate a need for a CRM system to underpin service delivery.

Most municipalities of Thunder Bay's size have implemented such a solution which is designed to track and route customer inquiries in a consistent and traceable manner.

While this work should not be considered an immediate priority (given the other work that is identified in the Strategy) it is an important component of any Municipal Technology Model and a significant undertaking that should be understood before any plans are made for implementation.

6.3 Digital Infrastructure

Ensuring we have the connectivity, Cloud capabilities and cybersecurity to support the City and our community.

6.3.1 Network Improvements and Long-Term Network Strategy

The City's networks are the foundation for all digital and technology capabilities and services. These networks must be robust, reliable, and highly performant. Working with Tbaytel as a partner, with fibre connections available across the City, there is no reason why this cannot be the case.

Today, however, the City's corporate network performance is not satisfactory at various locations. So, in the short-term, the City should increase its operational spend to increase network bandwidth and service to each of its facilities.

More broadly speaking, the City operates various networks, and demand for IoT solutions that will add more connections to City networks is ahead.

The City should consciously plan – with internal (e.g., InOps, Community Services) and external (e.g., Tbaytel, regional CIOs group) – for strategic network expansion and development, re-using, where possible, investments in networks for specific purposes that can be re-used for broader City and community benefit.

6.3.2 Public Wi-Fi Expansion

The CRTC has classed access to the internet as "a basic human right" and the community consultation for this project explicitly pointed to the fact that access to the internet is now an equity issue for the community.

This has flagged an opportunity to expand access to public Wi-Fi throughout the community, in civic facilities and in public spaces.

The City should work with Tbaytel and other community partners to figure out where expanded public Wi-Fi could add community value and develop a plan for implementation.

6.3.3 Automated Meter Reading (AMR) and Traffic Signaling

AMR is an IoT technology that provides remote meter reads and supports various other capabilities, such as time of use billing and customer near-real-time monitoring of their usage.

Many municipalities across Ontario and Canada have implemented such a solution. The Grant Thornton PSR recommended that the City evaluate the opportunity and business case and the City plans to develop a business case in 2022.

Subject to a business case being demonstrated and funding being available, work on the project could begin in 2024. A placeholder has been created for this project in the IT workplan as CIT staff will be required to support the delivery of such a project. This is a complex and large project that would need to be fully integrated into the City's water billing system.

The Traffic Signaling Modernization Program is an example of a City-wide IoT solution that is dependent upon a network. The modernization of the current traffic signaling network should be coordinated with other City network strategies.

The four-year upgrade program should be aligned with other City network planning as it is possible that network connections to traffic signal locations can be shared and other municipalities have pursued such a strategy.

6.3.4 Cybersecurity Program

Municipalities across Canada and North America are actively being targeted by cyber criminals. Those municipalities that have been the target of ransomware have been hit extremely hard.

Following their ransomware attack in 2019, it cost the Town of Woodstock over $1 million to recover and put suitable protections in place to prevent further attacks. The experience caused significant reputational and fiscal harm to the Town, not to mention the disruption and person hours that were poured into the resolution.

Clearly, the City must do what it can to mitigate a similar situation occurring. It needs to stay ahead of the situation by developing a comprehensive and robust security program.

Budget has been allocated in 2022 to ramp up the City's security efforts and to develop an ongoing, funded security program that will focus on policy, practices, education and training, as well as technology and services to mitigate the threats. Regular external assessments and testing will also be undertaken to independently verify the City's security posture and readiness.

6.3.5 Regional Partnerships

The consulting team recommends that the City's CIT Director work with regional partners to explore opportunities for partner working.

Areas of interest could include knowledge and experience sharing, shared investments in regional infrastructure, overarching data sharing agreements to simplify organization data sharing, shared staff technology training and shared staff development programs (staff exchanges, etc.)

Potential partners could include the regional hospital network, police, libraries, Tbaytel, and other local utility companies.

Establishing communication channels and a quarterly meeting between technology and digital leaders in each organization would be a good starting point. The agenda should facilitate sharing of strategy and work plans, allowing the group to explore commonalities and opportunities to partner. Work in this area is already underway and some promising opportunities have been identified.

More broadly, the City could also benefit from looking beyond the region to other municipalities and how they are tackling similar issues to Thunder Bay.

Establishing mutually beneficial relationships with other similar sized and situated communities such as Sudbury, Red Deer and Barrie could be extremely valuable in helping City management and staff find tried and tested practices, ideas, and approaches that can be borrowed and applied.

6.4 GIS and Data

Managing data well and using it to drive our practices and decision-making.

6.4.1 GIS Strategy

The City's GIS Strategy notes that the City is *"struggling to move beyond the departmental [maturity] level due to a combination of governance issues, unequal distribution of skills and resourcing gaps".* This is consistent with findings in this Strategy.

The GIS Strategy recommends a need for stronger collaboration, for robust governance, for GIS leadership and for clear roles and responsibilities. These recommendations are directed toward GIS specifically but also apply more broadly to digital and technology.

EMT has received the GIS Strategy. A request for a GIS Coordinator role to lead the execution of the GIS Strategy and to be based in CIT has been included in the proposed 2022 budget.

GIS leadership is essential to coordinate efforts of distributed GIS staff to priorities identified in the Strategy – including technology updates, moving to a web-based GIS delivery mode, roles and responsibilities clarification, provide training and to drive data improvement projects that will support strategic initiatives (such as asset management).

6.4.2 GIS Upgrades

GIS is one of the City's major enterprise platforms and one of the City's most advanced and developed data resources. Further exploitation of GIS at the City represents a huge opportunity to become more data driven.

The City's recently completed GIS Strategy – which this Digital Strategy fully supports and endorses – identified a series of GIS software upgrades (to version 10.7.1) and enhancements (ArcGIS enterprise) which would be required to gain full value from the technology. The upgrades are currently underway and should be completed in early 2022.

These enhancements will support increased use of Esri's Cloud services, enhanced mobile data collection and workforce management and the enablement of additional self-service GIS solutions. Furthermore, these upgrades will directly support the delivery of interim asset and work management solutions.

6.4.3 Internal and External GIS Self-Serve Solutions

The City should continue to democratize access to the GIS, making it simpler for non-GIS specialist use by deploying web-based GIS solutions and apps.

Several self-service solutions should be developed, including:

- Self-service map creator – Simple tools to allow staff to make their own maps, and map-based outputs without requiring a GIS professional to assist them.
- Field data collector – A generic tool for field-based data collection that feeds data into the corporate GIS database.
- Operations dashboards – A generic tool that can be used for visualizing and monitoring operational work such as inspections and work order completions.
- Where's my nearest – A customer-facing solution to help customers find their nearest services, for instance, where is the nearest park, recreation centre, waste disposal location, etc.
- What's happening here – A customer-facing solution to communicate what's happening at a location, for instance, roadworks, development proposal, City project.

Working with the GIS Coordinating Group and Community of Practice will help to identify other key solutions and services that are required.

6.4.4 Integration Technology

The City is in the process of implementing the Feature Manipulation Engine (FME) product as a GIS integration tool.

Various municipalities in the GTA use this solution as their corporate integration technology and we recommend that the City do the same – skilling up staff in CIT to support and implement integrations using FME.

FME has connectors that enable easy integration with SAP, Esri and Microsoft 365 along with Salesforce and a variety of other major software including Snowflake, Socrata, Maximo, Google Workforce, Cityworks and AWS.

6.4.5 Data Strategy and Governance

In pockets, the City is, of course using data to inform practices and using reporting and analysis to better understand service delivery, however, a longer-term goal for the City is to leverage data and analytics consistently and more effectively across the organization to mash-up data from different sources (e.g.,. Finance, HR, Work Management and GIS), to analyze performance, to identify patterns and distributions and to begin to anticipate and prepare for the future by getting into predictive analytics.

The City cannot be successful in this domain without high-quality data and without the right practices and procedures and clearly defined roles and responsibilities regarding data. This can be extremely challenging.

The City must also determine what its data priorities are – which datasets need work and which are the highest priority because of their broad use across the organization (e.g., employees, assets, addresses, GL codes).

Developing a Data Strategy is important – but this comes later in the plan – simply because, until the City has its core processes digitized, it lacks the core data it needs to truly derive strategic benefits from data investments.

6.4.6 Automated Vehicle Location (AVL) and GPS Review

The City currently uses various AVL systems to track vehicles and various data points around vehicle usage (speeds, mileage, plow up and down, etc.).

Looking to the future, the City should consider consolidating the various systems in use and look more closely at the value of sharing data about the City's snow clearing or road sweeping programs publicly.

This has, over the last decade, become fairly common practice across Canadian municipalities and the transparency has helped reduce calls and complaints from residents.

Furthermore, the City has a fleet of vehicles passing throughout the City and this can be looked at as a vast sensor network that can collect information about things such as weather, road condition, traffic, etc.

6.5 Digital Services

Providing great, self-serve digital experiences to customers over visits or calls to City Hall.

6.5.1 Digital Services First

It is recommended that the City make a formalized commitment to digital services by making a clear statement to internal service owners and staff that customers want to interact with the City digitally and, in turn, the City prefers to deliver services digitally over other channels.

6.5.2 Digital Declaration

As such, we suggest that the City have the City Manager, General Managers, Directors and Managers in the organization sign a Digital Declaration or attestation.

This declaration affirms our ambition for City services in the internet age and our commitments to realizing it.

It commits us to working to:

- Offer our services as end-to-end digital services that meet our digital service standard.
- Design services to best meet the needs of citizens.
- Protect citizens' privacy and security.
- Deliver value for money.

By signing the declaration, all leaders and owners of service in the organization acknowledge that the City's preferred and expected approach is for all services to be delivered digitally, that they commit to prioritizing the delivery of digital service in their respective areas, and that any new services must be designed Digital First.

Furthermore, leaders and management must work with staff to build the case for and support the realization of digital change. Ensuring consistent adoption of new digital processes must be fulsome – it cannot be variable or optional for staff.

6.5.3 Digital Service Standard

The Good Service Standard, developed by Lou Downe (a former staffer at the Government Digital Service in the UK) provides simple and digestible advice about how to build services that work.

Ms. Downe has identified fifteen principles of good service design and provides training on how to use and employ them.

Table 9: The 15 Principles of Good Service Design

15 Principles of Good Design – Lou Downe
1. Is easy to find.
2. Enables each user to complete the outcome they set out to.
3. Clearly explains its purpose.
4. Sets the expectations a user has of it.
5. Works in a way that's familiar.
6. Requires no prior knowledge to use.
7. Is agnostic of organizational structures.
8. Requires the minimum possible steps to complete.
9. Is consistent throughout.
10. Has no dead ends.
11. Is usable by everyone, equally.
12. Encourages the right behaviours from users and staff.
13. Responds to change quickly.
14. Clearly explains why a decision has been made.
15. Makes it easy to get human assistance.

The City should use this framework to be clear about what is expected of a good digital service and the Good Service Standard Scale is a tool that the City can use to evaluate and assess its current and future digital services[8].

When building new digital services, it is recommended that the City adopt a digital service standard.

It is recommended that the standard methodology shown below, proven to result in high-quality digital work and developed by the Ontario Digital Service, be adopted.

[8] Note that the Good Service Scale can be used to assess non-digital services too. More information is available at https://good.services/.

Ontario Digital Service Standard – Guidelines for Good Digital Practices

Release in phases:

1. Understand users and their needs.
2. Establish the right team.
3. Be consistent.
4. Design the service from start to finish.
5. Ensure users succeed the first time.
6. Test the end-to-end service.
7. Make it accessible and inclusive.
8. Be agile and user-centred.
9. Use open standards and common platforms.
10. Embed privacy and security by design.
11. Support those who need it.
12. Measure performance.
13. Be a good data steward.

Find out more at https://www.ontario.ca/page/digital-service-standard.

This standard was drawn from a community of practitioners working on digital government across the world – predominantly in the UK, US and Australia – so represents a set of well-worn and battle-tested best practices.

6.5.4 Forms Digitization Program

Many of the City's services are offered via application and many of those services require customers to complete forms.

In many cases, these forms are PDF or Word forms that provide a poor experience for customers, that don't validate or check the information that customers provide before they submit, and that are not accessible to some members of the community.

The City has implemented an eForms product as part of its website that can be used to turn those forms into simple, easy-to-use and accessible forms that work on any device, from smartphone to desktop.

The eForms product can collect any information from customers, can validate data entered (checking phone number of email formats, for example) can enable signatures and can process payments.

Furthermore, the eForms product can load the data submitted by a customer into a database or application, using its integration capabilities.

While building online forms is not the answer to complete services and full end-to-end digitization, it is a suitable interim step that provides improved services to customers at a relatively low cost.

Thus, in the interim, the City should work on converting all its forms into eForms, starting first with the highest volume forms that will have the largest impact to customers.

6.5.5 Payments, Billing and Online Payments

Customers and Council members flagged the importance of making it simpler and easier to pay all City bills, invoices, and fees online.

To achieve consistency, the City should set a corporate policy position on digital payments and implement simple, reusable payment solutions that can be integrated into all City services to accept all payment types.

In the interim, the City should work through the Fees and Service By-Law and enable standalone digital payments for the highest volume transactions that are suitable for moving to digital payment options.

A key measure of success will be the number of services for which digital payments are available and the uptake of digital payment options. Experience in other municipalities suggests that uptake will be significant.

Shown below is a sample Payment Processing Form from Georgian Bay. The form is simple and straightforward and mandatory information is clearly marked with an asterisk, making it easy for customers to understand and use the form for payment submission.

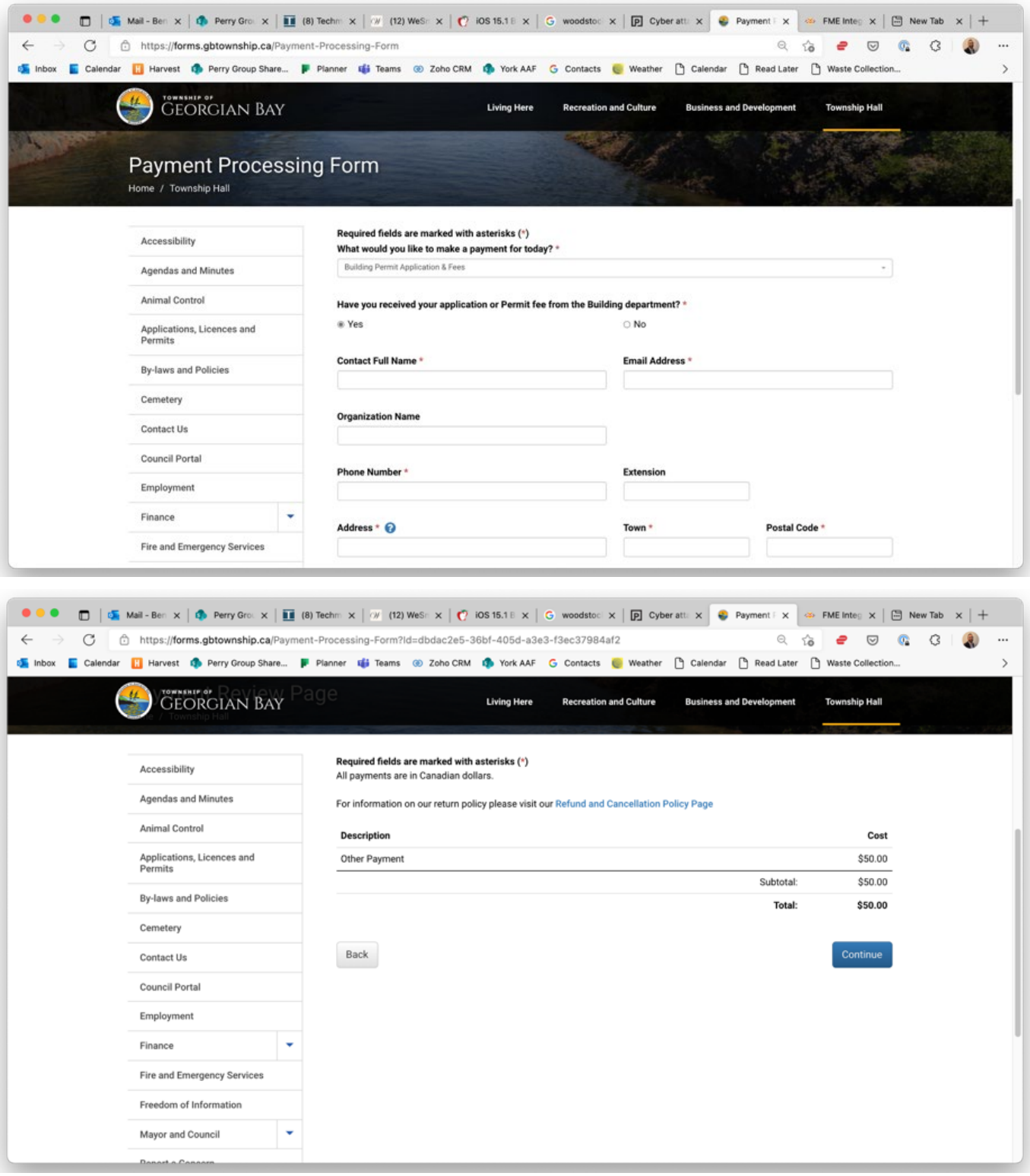


Figure 28: Sample Georgian Bay Payment Processing Form

6.5.6 Building Permits, Licences, Planning

As part of the work on AMANDA to support improved back-office and field office process workflows, the City plans to implement online permitting, licensing and planning services.

This will involve implementing a citizen portal for AMANDA that will enable customers to apply, pay, submit digital drawings, receive permits digitally, as well as book inspections online and receive pass and other notices online and via email.

6.5.7 Expansion of Recreation Programming, Marina and Campground Online Booking Management

The City has recently launched online recreation programming using PerfectMind, to which the community has reacted well.

Uptake of online booking has been healthy with 71% of recent registrations for families occurring online and with 55+ classes also seeing over 50% uptake of the online registration option.

The City intends to expand the services available for booking online, expanding the classes and courses available, as well as moving facilities booking online.

The City also plans to implement online booking and account management capabilities for the marina and City campgrounds.

7.0 Strategic Plan Support

The initiatives identified in the Digital Strategy directly support the City's Strategic Plan at all levels, including the Vision, strategic priorities, and strategic action areas.

The diagram below highlights where and how the Digital Strategy deliverables directly support each of these elements.

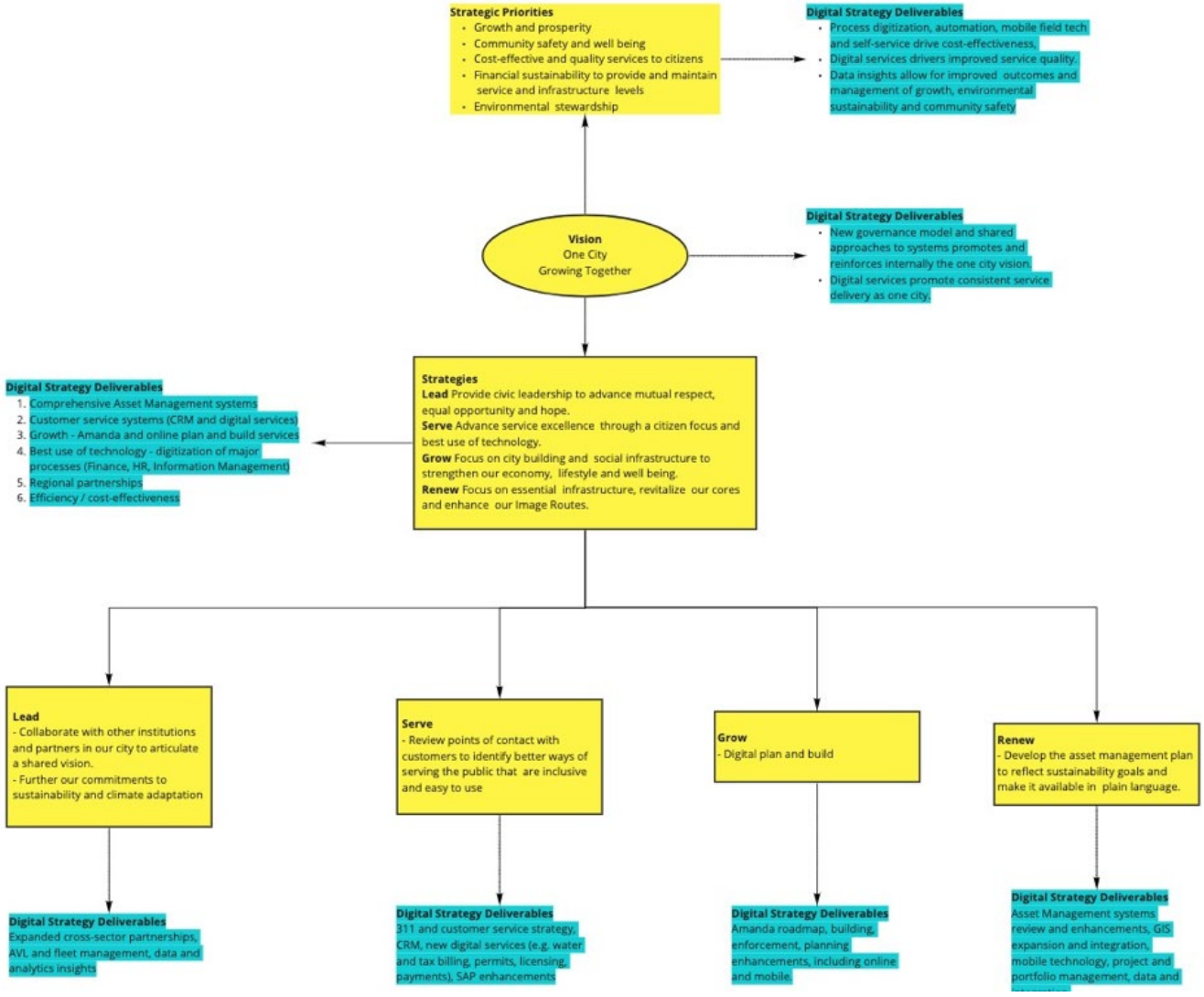


Figure 29: How the Digital Strategy Supports the Corporate Strategic Plan

The notion encapsulated in the **Serve** Strategy – *advance service excellence through a citizen focus and best use of technology* – is at the heart of the Digital Strategy, with a focus on customer-centricity and using technology to its fullest to provide quantifiable efficiencies that free staff from mundane, repetitive work, to focus on more value-added activities.

The Digital Strategy supports a range of other strategies and initiatives recommended as part of the Program and Service Review. These include:

- IT profile and capabilities (recommendations 14, 15, 16, 17).
- HR process and data management improvements (recommendations 20, 21).
- Fleet improvements (recommendations 27, 29, 34).
- Roads communications and engagement (recommendation 35).

The Strategy also directly supports work associated with:

- City's Accessibility Plan – Via an increased focus on web accessibility.
- Asset Management Plan – Via investment in asset management and GIS systems and data analysis capabilities.
- Economic Development Plan – By reducing red tape, simplifying and moving development and permitting processes online.
- Long-Term Financial Plan – By identifying up-front investments with long-term potential for savings and efficiencies.
- Recreation Master Plan – By expanding access to program registration and moving other services online.
- Climate – Through the implementation of tools that will facilitate increased work flexibility as well as improved asset management practices that will lengthen useful life of key City assets.
- Urban Forestry Management Plan – By continuing to provide tools and technologies to help the Forestry Team manage the City's forestry assets.

8.0 Roadmap

8.1 The Stages of Digital Organization

The Strategy envisions three discrete stages to putting the City on the path to becoming a more digital organization.

The three stages are:

- Setting Up for Success – 2021-2022.
- Digitizing Core Processes – 2022-2025.
- Digital Service Acceleration – 2023-2025.

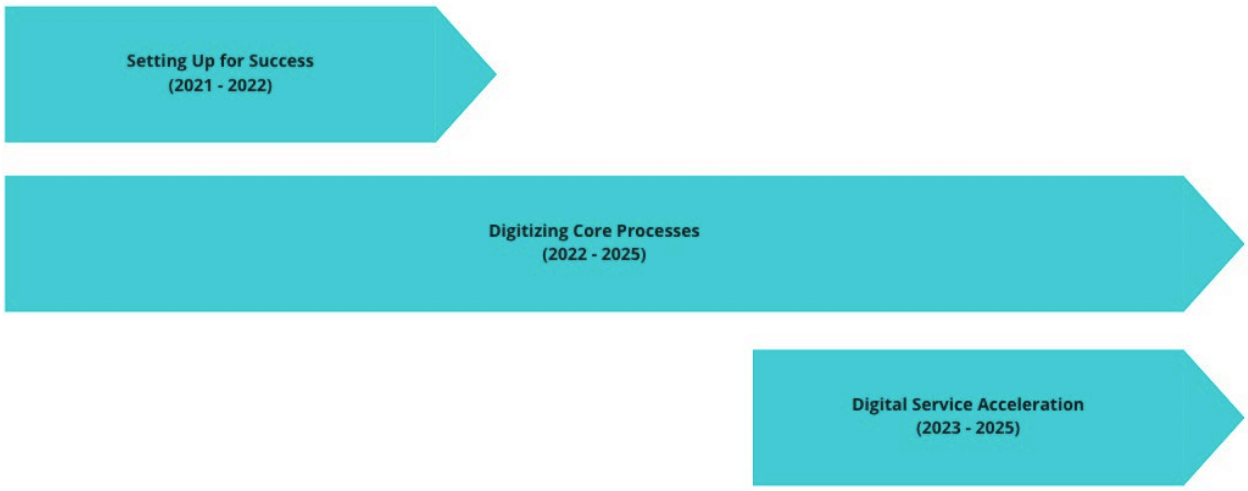


Figure 30: Strategy Implementation Staging

While this visually represents the approach, it should be noted that it does not mean that no digital services will be introduced before 2023.

On the contrary, numerous new digital services will be introduced but, in 2023, the City will be positioned to accelerate digital service delivery as a result of the progress made on back-office process digitization.

8.1.1 Setting Up for Success: 2021-2022

During this stage, the City will be:

- Establishing the new governance model.
- Readying for the 2022 budget process.
- Designing new intake processes.
- Applying project management best practices.
- Establishing the new IT organization structure.

This is a period of transition where projects will continue to be delivered, but where the focus will be on building out *how* things are being done – the right way.

8.1.2 Digitizing Core Processes: 2022-2025+

During this stage, the governance processes and new organization will be put in place and the engine of delivery will begin to develop.

Project capacity and delivery should begin to ramp up and a few of the significant enterprise business systems projects will be underway.

The work here is the core focus of the Strategy – digitizing core processes around people and money, assets and work, land and property and collaboration and information management.

8.1.3 Digital Service Acceleration: 2023-2025+

Work on digital service delivery is already underway and there are numerous online services planned for 2022 and beyond (as shown below).

However, the intent is that, in 2023, digital service delivery begins to really build momentum and speed.

As the City builds out its digitized foundations, it will enable the launch of new complete, end-to-end, real-time digital services for citizens including online permitting and licensing, massively expanded online payments, bookings, and online tax and water billing.

2022

- Mobile device (iOS and Android app) for parking payment and parking session management
- Online parking ticket and other citation payments
- Online forms digitization program (using eForms) – actively working on transforming high-volume forms from PDF / Word to online fillable forms (to include payments, image and document attachments, and digital signatures)
- Online program registration expansion – new programs, drop-in and facilities booking
- Online campground booking
- Digital elections
- Adoption of digital payments engine (including setting payments policies and standards, pre-authorized payments, etc.)
- Online water billing / portal
- Childcare online portal (registration, invoicing, tax receipts and communications)

2023

- Rollout online payments for high-volume, high-profile services
- Online booking engine (for appointments / bookings with City staff (e.g. family meetings/conferences)
- Establish Digital Approvals and Signatures Policy / practice and rapidly expand use of digital signatures
- Online building permitting (apply, pay, book inspections, receive inspection results)
- Online by-law complaints
- Online tax portal
- Online map services – where's my nearest (park, rec facility, recycling centre, etc.), what's happening here (planning, roadworks, etc.)
- Continued growth / expansion of Open Data (including Waze and other partnerships)

2024

- Online planning and development
- Online licensing
- Online sportsfield and park venue bookings
- Online special events permits
- Online sewer and water connection permits
- Online marina booking – customer self-service / payment portal
- Ongoing waste management digital service improvements – expansion of recollect.net
- Additional InOps permits (e.g., heavy loads), online forms and payment
- Digitized FOI system + proactive disclosure, including expanded Open Data publishing

Track my plow

-

8.2 Major Strategic Activities

The timeline in the following table identifies the major and strategic activities that are recommended for the next four years.

The workstreams and supporting activities are abbreviated in the table as follows:

- Digital Workplace: **Workplace**
- Digital Processes: **Process**
- Digital Infrastructure: **Infra**
- GIS and Data: **GIS and Data**
- Digital Services: **Services**
- Governance: **Gov**
- IT Organization: **Org**
- Digital Culture: **Culture**

Table 10: Major and Strategic Initiatives Recommended for the Next 4 Years

Work-stream	Initiative	2021	2022	2023	2024	Review
Culture	Digital Strategy change management and digital literacy program.	X	X	X	X	
Workplace	Microsoft 365 (collaboration platform) implementation.	X	X	X	X	
Services	Parking service digitization.	X	X	X		
Process	Water Billing System replacement (to include online customer account portal).	X	X			
GIS and Data	Corporate integration platform (FME system implementation).	X	X			
Services	Transit Electronic Fare Management System.	X	X			
Process	Agenda.net replaced with eScribe.	X	X			
Gov	Establish working group – Asset and Work Management Systems.	X				
Org	Review CIT Manager role and establish as CIT Director and review CIT Supervisor roles.	X				

Work-stream	Initiative	2021	2022	2023	2024	Review
Infra	Traffic Signaling System upgrade (including reviewing options for additional sensors and cameras).		X	X	X	
Infra	Partnerships with Tbaytel, regional hospitals, Synergy North, police, libraries, CEDC and others to advance regional technology.		X	X	X	
Process	Enforcement service digitization, including mobile technology.		X	X		
Process	Building service digitization to include mobile and ePermitting and digital drawing management.		X	X		
GIS and Data	Expanded internal GIS solutions (including Collector, Operations Dashboards, etc.).		X	X		
Gov	Conduct information, technology, digital and security policy review and build out required policies.		X	X		
Gov	Conduct a review of IT financing and determine most suitable and effective funding and budgeting mechanisms.		X	X		
Workplace	Information Management Strategy.		X			
Org	Review water and wastewater IT and OT responsibilities and accountabilities.		X			
Process	SAP multi-year product roadmap, upgrade and Finance process automations and self-service.		X	X	X	
Infra	Network Strategy and upgrades.		X	X		

Work-stream	Initiative	2021	2022	2023	2024	Review
Infra	Further develop and grow the Cybersecurity and Risk Management Program.		X	X	X	
Services	Digital First policy/commitment and corporate-wide communication.		X			
Services	Online program registration expansion (programs, drop-in and facilities).		X			
Services	Digital elections.		X			
Services	Online campground booking.		X			
Services	Online childcare portal.		X			
Gov	Constitute IDTG Committee.		X			
Gov	Set up Architecture Review Board.		X			
Gov	Set up opportunity intake and project prioritization process, including ROI assessments.		X			
Gov	Digital Strategy performance / progress metrics.		X			
Process	Work and Asset Management Systems review and modernization.		X	X	X	
Services	Online Forms Digitization Program (using eForms product), actively working on high-volume forms.			X	X	
Workplace	Electronic Document and Records Management (ERM).			X	X	

Work-stream	Initiative	2021	2022	2023	2024	Review
Workplace	Smartphone and Computing Devices Review and Modernization Program.			X		
Process	Tax Billing System replacement and implementation of customer portal.			X		
Infra	Cloud Adoption Strategy, policy and roadmap.			X		
Services	Implement online payments for high-volume, high-profile services.			X		
Services	Online booking engine (expansion / deployment).			X		
Infra	Automated Meter Reading (TBC based on business case).				X	
GIS and Data	Data Management and Governance Strategy.				X	
GIS and Data	Data platform, data visualization and analytics pilots and projects.				X	
GIS and Data	Review AVL/GPS Solutions Strategy and implement a variety of AVL solutions (e.g., track my snowplow).				X	
Services	Online services, including marina and other permits.				X	
Process	CRM system.					X

8.2.1 Assumptions and Caveats

2022 Projects

The City has identified in the proposed 2022 budget, funding for Digital Strategy initiatives that will be applied to projects identified for 2022.

In addition, budget requests for additional staffing to support the delivery of the Digital Strategy have been identified and are included in the proposed 2022 budget.

Thus, recommended Strategy activities identified for 2022 can be funded within the proposed 2022 budget envelope.

Budget Process and Funding

The roadmap does not include detailed costing for each project because, at the *Idea* stage, estimates would be too high-level and misleading to provide useful guidance.

Nonetheless, order of magnitude estimates have been provided to City management by the consulting team for all the projects identified.

As described in earlier sections of this report, moving forward, the City will develop a combined annual technology Work Plan, supported by suitable business justifications and cases that have followed the required due diligence steps. This means that individual project proposals will have passed through the *Idea, Concept* and *Project* proposal stages, allowing for the development of detailed financial, resource and business cases that demonstrate their value.

Through future years' budget processes, individual projects will be required to clearly articulate the business value before being approved and funded.

Resources

It has been assumed that the City will be able to allocate sufficient resources to support the implementation of the roadmap – at least in 2022 to start implementation work.

Several IT resources have been identified in this Strategy as immediate needs required to bolster critically important services. These requests are included in the proposed 2022 budget.

Further, many initiatives will also require investment in departmental resource to fulfill the business function as associated with technology projects.

Going forward, as already discussed in the Alternative Resourcing Strategies section, the use of contracting and backfilling, along with vendor resources to augment internal resourcing, will be key to successful project implementation.

In future budget cycles (2023 forward), all project proposals shall also identify resource costs allowing for the capitalization of resource costs and allowing the City to secure contract staffing and to execute backfill programs.

Timing

It is the responsibility of the CIT Director and IDTG to use this roadmap as input to guide annual work planning, however, the suggested timing of these activities is based on information known at this time and may be subject to change as business needs and situations arise.

New initiatives – which will be managed through the new project intake process – should also be anticipated.

Annual Recalibration of the Roadmap

The City should establish an annual process with the CIT Director and IDTG to recalibrate the four-year plan following the completion of the annual Work Plan.

The revisit will identify new initiatives on the horizon and revise timing of anticipated work.

8.3 Benefits and Efficiencies

Investment in technology is typically an investment in staff productivity, community benefit, or improved customer service.

Any investment should be expected to achieve a return on that investment and that return should be measurable. As such, it has been recommended earlier in this report that the City adopt a business case approach to justifying and evaluating proposed technology investments.

8.3.1 Understanding Benefit Types

It is important to understand that benefits from technology investments typically fall into several categories:

Cashable benefits: Cashable benefits are changes that result in the municipality having more money to spend, either through savings or through additional revenues.

Non-cashable benefits: Non-cashable benefits are changes that do not lead to an immediate cashable benefit, but save money in future budgeting periods, by avoiding adding staff, or avoiding future procurement costs.

Wider economic benefits: These improve things for your customers outside your organization and include things like:

- Saving users' time or improving their experience.
- Reducing private sector costs (e.g., time costs associated with waiting for a building permit).

Some projects will deliver all three of these benefit types, however, the typical benefit that we see with the types of technology proposed in this Strategy will result in a combination of non-cashable savings and wider economic benefits.

This means that the benefits are achieved with staff working less on repetitive activities that are suited to computers and more on higher value activities; with inspectors and crews getting more done; with applications and licences processed faster, and these kinds of things.

The benefits manifest themselves in cost avoidances and higher service delivery standards.

8.3.2 Examples of Potential Benefits

There are numerous examples of municipalities achieving cashable and non-cashable benefits through the implementation of technology, some of which are highlighted in the examples below.

Digital in Action

- The City of Mississauga moved its recreation guide fully online, replacing its paper-based version and saving $230,000 per year in printing and distribution costs.
- The City of London implemented iPads for Fire inspectors. Mobile inspections are now 25% more efficient.
- Similarly, a BC municipality plans to move to a mobile-enabled, paperless process for Fire inspections. It anticipates reduced administrative support needs from 60 days a year to 4 days per year and savings of up to $185,000 a year in labour savings across the service.
- The City of Hamilton saved an estimated $360,000 per year by implementing mobile inspection tools for its 37 building inspectors.
- The City of Mississauga, a BILD acknowledged leader in online development and planning, has seen a 25% decrease in total review time (elapsed time to review applications) and a 57% decrease in time taken to process site plans through the digitization of the Development Approvals process. Customers are no longer required to submit 30 hard copies of each drawing. Continuous improvements related to digitization and lean process review have resulted in over $1,000,000 in savings.
- The City of Edmonton has trained a Machine Learning model on a decade of data to speed safety inspections. Inspections deemed minimal risk are passed automatically, eliminating unnecessary delays in builder timelines. Since October 2019, the predictive model has reduced the number of eligible inspections by 37%. City inspectors can focus on higher risk and more complicated inspections, which pose greater threat to safety.
- Corpus Christi, TX implemented a mobile work management for its field crews and saw the average number of work orders closed per day increase from 11 to 18, an increase in productivity of 63%.
- The City of Guelph conducted an efficiency review of its mostly manual time and attendance processes. The process consumed an estimated 54,000 person hours each year at a cost of $2.5 million. Digitization is anticipated to halve the cost of running the process.
- The City of Cambridge has used its Asset and Work Management system to systematically increase the roads rated “good” by 50% over a 3-year period. This is expected to eliminate over $71 million in repair backlogs.

- By analyzing their work orders, wastewater staff at Corpus Christi found that nearly 33 percent of the department's effort was spent resolving problems at just 1.4 percent of customer sites. With this information, the City developed and implemented a repair plan that resolved these ongoing issues and ultimately significantly reduced costs.
- Implementation of a new digital parking process for paid parking, permits and tickets along with the introduction of Administrative Monetary Penalties has seen one Ontario municipality increase revenues by $400,000 and reduce staff time to administer the program by over 8,000 person hours valued at around $500,000.
- The City of Brampton implemented an online Request To Park On Street Overnight. The solution handled over 100,000 requests online per year, which equated to a reduction of 2 FTEs taking calls at the contact centre.
- The City of Chatham-Kent implemented a virtualized call/contact centre for the delivery of improved customer service experience and increased resolution of customer inquiries at the first point of contact, realizing annual savings of over $160,000 in service delivery.

In addition to these examples, Perry Group has a team of business process consultants that work with municipalities to optimize processes. The team has been busy with municipal modernization projects funded by the Province and, over the last two years, has completed over 200 business process optimization reviews with municipalities across Ontario. In each case, optimization involves streamlining and simplifying processes and applying process digitization and digital service concepts to redesigned services.

Quantifiable efficiencies identified have ranged from $20,000 – $900,000 per year, with an average of $80,000 per high-volume process/service.

Given the low levels of process digitization present at the City today, it should be anticipated that similar savings could be possible across many of the City's major processes through digitization.

8.3.3 Specific Benefits for Thunder Bay

The Strategy does not establish a full business case for every project identified. This is not possible at this time because the Strategy has not worked at the detail level needed.

As noted above, the major projects coming forward in future budgets should articulate a clear business case.

Nonetheless, focusing on the following four specific initiatives identified in the Strategy, the consulting team and City staff have collated information to illustrate estimated benefits and highlight potential benefits that could be achieved from some of the proposed digitization of core processes.

Table 11: Potential Benefits from Some of the Proposed Digitization of Core Processes

Initiative	Benefits	Benefit Type	Comments
Accounts Payable Automation	Estimated $120 – $160k benefits in staff time savings per year	Non-cashable	Investment of $320k required with a payback of 2.5 years
Time and Attendance Automation	Estimated $500k benefits per year achieved through timekeeper time savings, reductions in time capture errors (estimated at up to 7%), improved overtime controls, and improved punctuality	Cashable and Non-cashable	Investment of $500k – $750k with a payback of 1.5 years. Estimate based on 3,000 employees
Building Permitting Automation	Estimated $200k benefits in staff time savings per year + customer experience improvements and faster permit processing	Non-cashable and Wider Economic Benefits	Investment of $500k required with a payback of 2.5 years. Using 1,000 permits and 4,500 inspections as the baseline, and a 4-hour time saving per permit
Water and Tax Billing Automation	A conservative estimate of 1 FTE saving per year through automation + customer experience improvements	Cashable and Wider Economic Benefits	5 FTEs in Finance currently administer water and tax payments, address changes

8.3.4 Benefits Realization

As noted, the benefits of digitization and adoption of a Digital First approach to service delivery typically materialize in the form of staff time savings and thus are realized in business units, not in the CIT Division that helped implement the technology.

Often, benefits take the form of cost avoidance – delaying the need to add new staff to cope with growing demand, for instance.

Furthermore, these savings are often incremental and distributed across many staff members. They can manifest as reductions in administrative time tied up with paperwork, an increase in the number of inspections or work orders that a member of staff can complete in a given time, or a reduction in the number of activities taken to complete a task.

Individually these may be small, but collectively they accumulate and can have a large impact as illustrated by the time and attendance initiative in the previous sections.

The City should track and report on its success against achieving goals set out in business cases, and the Finance team should work with business teams to ensure that savings goals are realized, recovered, and reinvested appropriately.

9.0 Conclusion and Recommendations

This Strategy represents a comprehensive response to the digital opportunities that are in front of the City and that were raised in the PSR.

The Strategy is designed to focus attention on key opportunities and position the City to successfully realize those opportunities and deliver digitally-powered City services.

9.1 Following the Strategy

Following this Strategy will:

- Ensure that the City can deliver services more efficiently.
- Clear current barriers to digital delivery.
- Reduce wasted effort and divergent technology spend.
- Ensure staff are as productive as they can be.
- Ensure that the City can deliver services that meet the changed expectations of many of the City's customers.

Delays to the implementation of recommendations will result in delays to the realization of the potential benefits identified.

9.2 Summary of Strategy Recommendations

In summary, the Strategy recommends that the City should:

1. Adopt and communicate corporate-wide a clear strategic intent and vision for digital service delivery as the City's primary platform for customer service – **a collaborative approach to delivering customer-centred, digitally-powered City services.**
2. Ensure that all service owners commit to moving toward Digital First service as a priority through the signing of the Digital Declaration.
3. Focus on work in the **five key workstreams** below, staying focused in these areas and avoiding distractions with new opportunities:
    a. **Digitize core business processes** as a top priority focusing first on people, money, assets and work, land and property-centred processes and document-centric processes.
    b. Invest in the **digital workplace** to ensure that staff and partners have access to modern collaboration tools that enable them to be productive and effective.
    c. Provide **digital infrastructure** to ensure that the community has access to reliable broadband services and ensure that the City is positioned to be future-proofed and cyber-secured.

d. Invest in **GIS, data and analytics** to ensure that the City optimizes its effectiveness and efficiency.

e. Build **digital services** to deliver City services that meet customer expectations.

4. Setup and operate the recommended Information, Digital and Technology Governance Model to help keep the organization focused on strategic priorities, to enable shared learning and collaborative working on the technology and digital portfolio. This includes:

   a. Establishing a corporate Information, Digital and Technology Governance team, to be led by EMT and CIT Management, and to ensure sufficient time and attention can be paid by leadership to strategic technology and digital opportunities.

   b. Establishing coordinating groups as the forum for collaboration in key areas of strategy focus – work and assets, land and property, customer service and digital, GIS and data.

   c. Establishing a singular intake process for technology initiatives that applies suitable levels of rigor, ROI assessments and architecture to *Idea, Concept* and *Project* proposals.

   d. Conducting an IT policies review and expanding the City's IT policy framework to address important areas.

5. Setup and operate the proposed IT and Digital Operating Model to support the delivery of this Strategy and new digitally-powered services. This includes:

   a. Elevating the CIT function and pursuing a centralized approach to core technology staffing.

   b. Formalizing a revised mandate for CIT along with formalizing roles and responsibilities between CIT and departmental staff (as recommended in this Strategy).

   c. Reviewing and elevating CIT Manager and Supervisor roles in line with the City's guidelines for Organizational Job Level Titles.

   d. Increasing investment in IT staffing with recommendations to add the following positions in a phased approach over the next 4 years:

      - Manager, Delivery.
      - GIS and Data Coordinator.
      - Project Manager / Business Analyst x 3.
      - Application Developer / Analyst x 2.
      - Data Engineer.

   e. Working on building stronger IT / business unit relationships through a new CIT Run relationship management function.

f. Adopting a consistent project management methodology and improving project delivery capabilities and project outcomes.

g. Increasing focus on architecture.

h. Pursuing alternate resourcing strategies (including capitally funding staffing, using rosters and increasing use of out-tasking) to add additional capacity to CIT to support the delivery of digital solutions.

6. Review IT funding and increase IT investment.

   a. Review current approach to IT investment and determine a suitable go-forward model that provides the insights and controls necessary over the City's total technology spend.

   b. Fund projects for 2022 through proposed budget commitments and submit 2023 budget requests to support implementation of the next stages of the Strategy.

   c. Establish new sources of funding to support increased technology investment, targeting a 3% investment level (capital and operating) at minimum.

   d. Capitally fund staffing and backfill for technology projects.

   e. Begin to prepare for capital to operating transition associated with a move to subscription and Cloud services.

   f. Invest in **digital change management, education, and culture change** through showcasing successes, bringing in external speakers, building CoPs.

7. Measure and report on digital performance and successes.

   a. Establish a Digital Strategy Performance Dashboard that reports on key metrics defined in this Strategy.

   b. Provide an annual report to Council and EMT on progress against the Digital Strategy.

Appendix A – Glossary of Terms

Table 12: Glossary of Terms

Term	Description / Explanation
ADKAR	Awareness, Desire, Knowledge, Ability, Reinforcement: A change management framework that defines the five outcomes an individual must achieve for any change to be successful.
Architecture	In the context of a technology architecture, is a framework of information technology standards, specifications, models, and guidelines for the enterprise.
BA (Business Analyst)	A role in the Information Technology department for someone who analyzes and documents business processes or business needs for the purpose of sourcing, implementing or enhancing technology.
BI (Business Intelligence)	A technology-driven process for analyzing data and presenting actionable information to help executives, managers and other corporate end users make informed business decisions.
Business Transformation	Significant change (in this document, enabled by new technology) that modifies the fundamental model of *how* or *what* services are delivered.
BYOD (Bring Your Own Device)	A practice of allowing employees of an organization to use their own computers, smartphones or other devices for work purposes.
CTB	City of Thunder Bay.
Cityworks	Asset and Work Management System currently used to plan and track roads and water / wastewater assets.
CLASS	The City's current leisure Registration and Booking Management System.
Cloud, Cloud-Based, Cloud Solution	Cloud-based is a term that refers to applications, services or resources made available on demand via the internet from a remote service provider.

Term	Description / Explanation
COBIT (Control Objectives for Information and Related Technologies)	A best practice framework created by international professional association ISACA for information technology management and IT Governance.
Cogeco	A telecommunications and media service provider.
COPE (Corporately Owned Personally Enabled)	A business model in which an organization provides its employees with mobile computing devices and allows the employees to use them as if they were personally-owned computers, tablets or smartphones.
CRM (Customer Relationship Management)	A category of software designed to help businesses manage customer data, requests and interaction.
Digitization	Digitization is referred to in this document as the conversion of traditional manual or paper-based business processes to technology and data driven form.
Drones	An aircraft without a human pilot aboard, controlled from a ground-based controller.
ECM (Enterprise Content Management)	A series of tools and processes that manage storage, security, version control, process routing and retention of corporate information.
EMT (Executive Management Team)	The City of Thunder Bay's executive team, comprised of the City Manager and General Managers.
ERP (Enterprise Resource Planning)	A system to aid the flow of internal business processes and allow for communication between a business's departments and its internal functions and data. ERP systems include functions such as human resource management, financial management, supply chain management and enterprise performance management.
ESRI	An international supplier of geographic information software (GIS) applications and services.
Firehouse	A records management system tailored for the Fire services industry.
FTE	Full Time Equivalent employee.

Term	Description / Explanation
Geospatial, Spatial	A term used to indicate that data has a geographic component to it. As of recently, the term is picking up popularity in the industry as a substitute for the term GIS.
GIS (Geographic Information System)	A framework where geographic information is stored in layers and integrated with geographic software programs so that spatial information can be created, stored, manipulated, analyzed and visualized (mapped).
Google (G-Suite)	A Cloud-based set of productivity (word processing, spreadsheets, etc.) and collaboration tools offered by Google.
Hot Desking	Enabling multiple workers to use a single physical workstation or surface during different time periods.
iMedic	A Records Management System tailored for the emergency medical services industry.
Integration	In the context of a technology integration, is the use of technology tools to allow multiple systems, processes, or datasets to be combined to produce a common output.
ITIL (Information Technology Infrastructure Library)	A set of detailed practices for IT Service Management (ITSM) that focuses on aligning IT services with the needs of business.
LT (Leadership Team)	The City of Thunder Bay's senior level leadership group comprised primarily of General Manager and Director level staff.
LPMS (Land Planning Management System)	A system to manage and automate workflows associated with building, planning, engineering, permitting, inspections, code enforcement and other land management activities.
Microsoft 365 (formerly known as Office365)	A Cloud-based set of productivity (word processing, spreadsheets) and collaboration tools offered by Microsoft.
Microsoft Exchange	A mail server and calendaring service developed by Microsoft, typically bundled with Microsoft Outlook.

Term	Description / Explanation
MTM (Municipal Technology Architecture)	A model developed by Perry Group Consulting Ltd. identifying the technologies that a municipality should have in place and providing a framework for assessing a municipality's technology environment.
Municipal Benchmark Network (MBN)	A network of Canadian municipalities collaborating to share detailed information and metrics on services and practices to help reduce costs and improve quality of service. MBN was used in this Digital Strategy as a comparative to assess current levels of investment in information technology.
Omni Channel Services	A service that can be accessed through multiple tools, processes and approaches, e.g., requesting a new blue box can be done in-person, online, through a mobile application or over the phone.
Open Data	The idea that some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control.
PM (Project Manager)	A role assigned overall responsibility for overseeing the planning and execution of a particular project.
PMBOK (Project Management Body of Knowledge)	A set of standard terminology and guidelines for project management as published by the PMI (Project Management Institute).
PMI (Project Management Institute)	Industry leading professional membership association for the project management profession.
Retention / Data Retention	The continued storage of an organization's data for compliance or business reasons.
SAP	The City's ERP system.
StoneOrchard	A Records Management System tailored for cemeteries and funeral homes.
Telco (Telephone Company)	Telephone service provider or telecommunications operator.

Term	Description / Explanation
TOGAF (The Open Group Architecture Framework)	A framework for enterprise architecture that provides an approach for designing, planning, implementing and governing an enterprise information technology architecture.
Vailtech	A business system designed to collect and manage property tax payment.
Wi-Fi	The facility allowing computers, smartphones or other devices to connect to the internet or communicate with one another wirelessly within a particular area.

Appendix B – Project Participation

The following people were involved in the development of the Digital Strategy.

Digital Strategy Steering Committee

EMT operated as a Digital Strategy Steering Committee for the project, with the following membership.

- Norm Gale, City Manager
- Cynthia OIsen, Acting Director, Corporate Strategic Services
- Tracie Smith, Director of Strategic Initiatives and Engagement
- Karen Lewis, GM Development and Emergency Services
- Karie Ortgiese, Director Human Resources and Corporate Safety
- Kelly Robertson, GM Community Services
- Kerri Marshall, GM Infrastructure and Operations
- Linda Evans, GM Corporate Services and Long-Term Care
- Jack Avella, CIT Manager and Project Manager
- Ben Perry, Perry Group Consulting

Strategy Development Participants

Directors, Managers, and representatives from the following business units contributed to the development of the Digital Strategy.

- Roads
- Recreation and Culture
- CIT
- Licensing and Enforcement, Realty and Parking
- Environment
- Building and Planning
- Transit
- Financial Services
- Internal Audit and Continuous Improvement
- Revenue
- Long-Term Care
- EMS and Fire
- Facilities, Fleet and Energy
- Childcare and Central Support Services
- InOps Central Support
- Corporate Strategic Services and Indigenous Relations and Inclusion
- Engineering and Operations
- Human Resources and Corporate Safety
- Parks and Open Spaces

Council and Committees

- Mayor and Council members
- Accessibility Advisory Committee
- Community Communications Committee

Members of the Community

- Online survey and consultation
- Public meeting / open house

External and Partner Consultees

Representatives from the following organizations met with the consulting team.

- CEDC
- Thunder Bay Public Library
- Thunder Bay Police Service
- Synergy North
- Tbaytel
- Chamber of Commerce

Consulting Team

- Ben Perry, Project Manager and Lead Consultant
- Alrick Grange, Snr Consultant
- Blair Labelle, Snr Consultant

Appendix C – Details of the Guiding Principles

The following section provides additional details related to the guiding principles.

Principle	The customer is the end user.
Explanation	The City should focus on the end user as the consumer of services and solutions. These service consumers may be internal (think users of HR or Finance services) or external (think builders that will use the online building permitting functions). The City should not design solutions or services without the input of the customer.
Implications	• When developing solutions or services, involve the customer (internal or external) in co-design ensuring that their input meaningfully contributes to better design. • Process mapping and customer journey mapping should be used on projects to ensure that the voice of the customer is heard. • Test solutions with customers (in a beta or pilot stage) before launching them.

Principle	Services should be demonstrably better as a result of investments in technology.
Explanation	Investment in technology is designed to *improve* the situation through lower service delivery costs, improved customer service, reduced risks, cost avoidance or a range of other factors. Before a project is approved, a clear justification should be made regarding the anticipated and quantifiable business benefits to be achieved. Once a project is implemented, the City should track the results to ensure that the planned benefits are achieved.
Implications	• Suitable due diligence is required to fully evaluate projects before funding and resource commitments are made. • Business cases will be required for projects. • Post implementation reviews will be conducted to ensure that anticipated business benefits are achieved and project sponsors will be held accountable for achieving benefits. • Benefits tracking process will allow the City to understand the overall ROI for IT investments.

Principle	Enterprise systems should be deployed if they meet at least 80% of business needs.
Explanation	The intent is to reduce the number of systems that the City operates. This means re-using existing systems before purchasing new systems, i.e., if the requirements are substantially met by an existing system, the preference is to re-use an existing system.
Implications	• Detailed requirements are needed to support the assessment process. • Any exceptions will be escalated to EMT for evaluation. • Re-use of existing enterprise systems (Cityworks, PeopleSoft, GIS) will be encouraged.

Principle	Data is an asset.
Explanation	Data is a *corporate* asset that must be treated like other assets with a clear lifecycle and with resources allocated to its maintenance. Data is owned by the corporation thus, unless subject to legal restrictions, data should be openly shared within the organization. Data stewards are responsible for the security, upkeep and lifecycle maintenance of high-quality data.
Implications	• Increased open-ness toward data sharing. • Data quality with clearly allocated roles, responsibilities and accountabilities.

Principle	Our approach to technology reflects our desire to be an employer of choice.
Explanation	The City aims to offer modern tools and technologies in flexible ways that ensure that technology is not a barrier to getting work done. The goal is to continually revisit and update the technologies to remain relevant and up-to-date.
Implications	• Supporting a range of device types (including frequent recalibration of needs and expectations from management and staff). • Working with a representative "tech savvy" forum to ensure that technology provisions are keeping pace with expectations and needs. • Supporting mobile and flexible working (Wi-Fi). • Modern collaboration tools and capabilities (online meetings, messaging, presence).

Principle	An enterprise-wide perspective will define technology priorities.
Explanation	The City has many competing demands for technology but focusing on fewer initiatives will lead to improved outcomes. In selecting fewer initiatives, taking an enterprise (complete corporation) view of defining priorities (through a corporate governance model) will deliver the best return on investment for the City and have the largest impact.
Implications	• A new governance model will be used to agree on priorities supported by a ranking and prioritization scheme. • Single annual technology project portfolio. • Some groups will be disappointed when their initiatives are not prioritized.

Principle	Technology investments must be supported by key indicators showing short- and long-term value earned.
Explanation	To support the selection process, business technology projects will require clear demonstrations of value. Value may take various forms – cost avoidance, cost savings, improved customer service, reduced risk.
Implications	• Processes to support value calculation (ROI, NPV) that reflect monetary and non-monetary value will be developed and applied to project proposals.

Principle	Technology is a means to an end – success is the result of collaboration.
Explanation	Implementing technology for technology's sake is not where the City will see value. Improved outcomes are the goal. Have the right stakeholders been engaged?
Implications	• Err towards over- not under-inclusion. • Quantify outcomes as part of the project justification process. • Focus is on outcomes and end-to-end services and process design, not on technology implementation. • Increased cross-functional working.

Principle	Architecture and standards drive decision-making.
Explanation	The City will develop and apply architecture and IT standards to reduce the complexity and cost of operating the technology environment, thus increasing agility, responsiveness, and the integration of information. New project proposals will be assessed against the architecture to ensure suitable fit. The Sponsor to IDTG will justify exceptions.
Implications	• Architecture review board to develop and set standards that will be endorsed by IDTG. • Architecture review board to review proposals against architecture and standards – proposals that don't meet standards may need to be adjusted, may be rejected, or may need a formal exception to be made.

Principle	Timely results and appropriate project oversight are key.
Explanation	Project implementation is desired quickly but projects need suitable project oversight to be successful. A suitable balance must be struck between the need to move quickly and ensuring projects have the right guidance and direction.
Implications	• Adoption of project management methodologies – including agile project techniques for projects that are suited to agile delivery – ensuring that the project approach provides enough, but not too much structure.

Appendix D – Detailed Implementation Plan

Table 13: Implementation Plan

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
1-Digital Workplace	1-1	MS 365 Adoption and Management Plan.	50			x			
1-Digital Workplace	1-2	Expand MS Teams to all staff + M365.	Budgeted	Budgeted		x			
1-Digital Workplace	1-3	Migrate to Exchange Online.					x		
1-Digital Workplace	1-4	Information Management Strategy.	75			x			
1-Digital Workplace	1-5	MS Teams / SP / OneDrive / Planner / To Do expansion, including use with external partners.	Budgeted	Budgeted		x	x		
1-Digital Workplace	1-6	Meeting Room Tech – updates.							x
1-Digital Workplace	1-7	Electronic Document and Records Management (ERM).	Budgeted	Budgeted			x		
1-Digital Workplace	1-8	Connect currently non-connected staff with City technologies and communications. Intranet external access (linked to device review).	Budgeted	Budgeted			x	x	

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
1-Digital Workplace	1-9	Mobile Working Tech Strategy – review mobile needs and determine suitable solutions strategies.	35			x			
1-Digital Workplace	1-10	Smartphone / devices review and modernization program.	Budgeted	Budgeted			x		
1-Digital Workplace	1-11	Desktop / laptop device review and replacements.	Budgeted	Budgeted			x	x	
1-Digital Workplace	1-12	Evaluate and implement extended CIT support hours for business units (outside of 8:30-4:30).		25			x		
2-Digitized Business Processes	2-1	Work and Asset Management – review and solution strategy.	75			x			
2-Digitized Business Processes	2-2	Interim Work and Asset Management solutions (Workforce) to support operations and AM needs.			x	x			
2-Digitized Business Processes	2-3	Work and Asset Management Systems modernization.	1000	200			x	x	
2-Digitized Business Processes	2-4	AMANDA expansion roadmap.	50			x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
2-Digitized Business Processes	2-5	Building service digitization to include mobile and ePermitting and digital drawing management.	250	50		x	x		
2-Digitized Business Processes	2-6	Enforcement service digitization, including mobile technology.	200	50		x	x		
2-Digitized Business Processes	2-7	Planning service digitization.	50	10			x		
2-Digitized Business Processes	2-8	SAP multi-year, product roadmap.	Budgeted	Budgeted		x			
2-Digitized Business Processes	2-9	SAP upgrade, including Fiori self-service apps.					x		
2-Digitized Business Processes	2-10	HR System (SAP) modernization and process digitization (core employee master records).	500	250			x		
2-Digitized Business Processes	2-11	HR recruitment interim solutions.				x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
2-Digitized Business Processes	2-12	Time and attendance.	500	250				x	
2-Digitized Business Processes	2-13	HR recruitment project.		50			x		
2-Digitized Business Processes	2-14	SAP: Self-service for expense management.	Budgeted	Budgeted				x	
2-Digitized Business Processes	2-15	SAP: Accounts Payable automation.	400	40				x	
2-Digitized Business Processes	2-16	Shift scheduling and shift management review and go-forward strategy.	250	75	x				
2-Digitized Business Processes	2-17	HR: Corporate Learning Management System.	TBD	TBD					x
2-Digitized Business Processes	2-18	Agenda.net replaced with eScribe.	Budgeted	Budgeted	x	x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
2-Digitized Business Processes	2-19	Water Billing System replacement (to include online customer account portal).	Budgeted	Budgeted	x	x			
2-Digitized Business Processes	2-20	Tax Billing System replacement and implementation of customer portal.	250	100			x		
2-Digitized Business Processes	2-21	LTC move to PCC from Med-i-Care with Mobile bedside charting.	TBD	TBD		x			
2-Digitized Business Processes	2-22	CRM system (including online portal capabilities, back-office integration and end-to-end service requests).							x
2-Digitized Business Processes	2-23	Archives digitization pilot.	TBD	TBD				x	
2-Digitized Business Processes	2-24	Project and Portfolio Management System.	TBD	TBD				x	
2-Digitized Business Processes	2-25	Specialized Transit on-demand service.			x	x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
3-Digital Infrastructure	3-1	Network Strategy – to consider all City network requirements (e.g., SCADA, bus stops, security, traffic management, AMR, landfill).	25			x			
3-Digital Infrastructure	3-2	Network upgrades.	TBD	TBD		x			
3-Digital Infrastructure	3-3	Public Wi-Fi expansion (in partnership with Tbaytel).	TBD	TBD		x	x	x	
3-Digital Infrastructure	3-4	Cloud Adoption Strategy, Policy, and roadmap.	50				x		
3-Digital Infrastructure	3-5	Automated Meter Reading – business case.	Budgeted	Budgeted		x			
3-Digital Infrastructure	3-6	Automated Meter Reading.						x	
3-Digital Infrastructure	3-7	Traffic Signaling System upgrade (including reviewing options for additional sensors and cameras).				x	x	x	
3-Digital Infrastructure	3-8	Further develop the Cybersecurity and Risk Management Program.	$56k budgeted in 2022 for cyber risk & business impact assessment			x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
3-Digital Infrastructure	3-9	Enterprise architecture roadmap.					x		
3-Digital Infrastructure	3-10	Grow partnerships with Tbaytel, regional hospitals, Synergy North, police, libraries, CEDC to advance regional technology opportunities and issues.				x	x	x	
4-GIS & Data	4-1	Set up working group – data and GIS.				x			
4-GIS & Data	4-2	Implement organization recommendations from GIS Strategy and roadmap.				x			
4-GIS & Data	4-3	GIS upgrades and Esri GIS portal.			x	x			
4-GIS & Data	4-4	Corporate Integration Platform – FME system implementation.	Budgeted	Budgeted	x	x			
4-GIS & Data	4-5	Expanded internal GIS solutions (including Collector, Ops Dashboards, etc.)				x	x		
4-GIS & Data	4-6	Expanded external GIS solutions (including where's my nearest, report a problem, what's happening here, etc.)					x	x	
4-GIS & Data	4-7	Ongoing GIS data creation and data integration (e.g., assets, service connections, etc.)				x	x	x	
4-GIS & Data	4-8	Create Data (and GIS) Community of Practice.				x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
4-GIS & Data	4-9	Expand Open Data program.						x	
4-GIS & Data	4-10	Data Management and Governance Strategy.						x	
4-GIS & Data	4-11	Data analytics/BI pilots.						x	
4-GIS & Data	4-12	Community and performance dashboards.						x	
4-GIS & Data	4-13	Data platform.						x	
4-GIS & Data	4-14	Establish master data sources for key data.						x	
4-GIS & Data	4-15	Review AVL/GPS solutions strategy and implement a variety of AVL solutions (e.g., track my snow plow).						x	
5-Digital Services	5-1	Digital First policy/commitment and corporate wide communication.	0	0		x			
5-Digital Services	5-2	Define digital service standards and assessment methodology.	0	0		x			
5-Digital Services	5-3	Online Program Registration Expansion – programs, drop-in and facilities.				x			
5-Digital Services	5-4	Online sportsfield and parks venue bookings.						x	

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
5-Digital Services	5-5	Online special events permits.						x	
5-Digital Services	5-6	Online sewer and water connection permits.						x	
5-Digital Services	5-7	Implement online payments for high-volume, high-profile services.	50	25			x		
5-Digital Services	5-8	Online booking engine – expansion / deployment.	0	0			x		
5-Digital Services	5-9	Online forms digitization program (using eForms product) – actively working on high-volume forms.	0	100	x	x	x	x	
5-Digital Services	5-10	Establish digital approvals and signatures policy / practice.	0	0			x		
5-Digital Services	5-11	Implement digital approvals solutions (approvals and signatures).	0	25			x		
5-Digital Services	5-12	Digital elections.	Budgeted	Budgeted		x			
5-Digital Services	5-13	Online marina booking – customer self-service / payment portal.						x	
5-Digital Services	5-14	Online campground booking.						x	
5-Digital Services	5-15	Transit Electronic Fare Management System.	Budgeted	Budgeted	x	x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
5-Digital Services	5-16	Parking service digitization.			x	x	x		
5-Digital Services	5-17	Ongoing waste management digital service improvements – expansion of Recollect.						x	
5-Digital Services	5-18	Online driveway permits.			x				
5-Digital Services	5-19	Additional InOps permits (e.g., heavy loads) online forms and payment.	50					x	
5-Digital Services	5-20	Digital signage/advertising review and program.	TBD	TBD					x
5-Digital Services	5-21	Digitized FOI system + proactive disclosure, including expanded Open Data publishing.	25	10				x	
5-Digital Services	5-22	Adoption of digital payments.	40			x			
5-Digital Services	5-23	Childcare system and online portal.				x			
6-Digital Governance	6-1	Approve and begin to implement IDTG Framework.			x				
6-Digital Governance	6-2	Constitute IDTG Committee.				x			
6-Digital Governance	6-3	Conduct Information and Digital, Technology, and Security Policy Review and build out required policies.				x	x		

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
6-Digital Governance	6-4	Conduct a review of IT Financing and determine most suitable and effective funding and budgeting mechanisms.				x	x		
6-Digital Governance	6-5	Setup People and Money Working Group.				x			
6-Digital Governance	6-6	Setup Land and Property Working Group.				x			
6-Digital Governance	6-7	Establish Working Group – Asset and Work Management Systems.			x				
6-Digital Governance	6-8	Setup Architecture Team.				x			
6-Digital Governance	6-9	Setup opportunity intake and project prioritization process, including ROI assessments.				x			
6-Digital Governance	6-10	Project Management Framework.				x			
6-Digital Governance	6-11	Introduce benefits tracking and realization program.					x		
6-Digital Governance	6-12	CIT workplan and resource allocation.				x			
6-Digital Governance	6-13	Continue to measure and report on digital maturity and good service.	0	0		x			

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
6-Digital Governance	6-14	Digital Strategy performance / progress metrics.				x			
7-Digital Culture	7-1	Digital Strategy Change Management Program.			x	x	x	x	
7-Digital Culture	7-2	Digital literacy program – speaker and event series.				x			
7-Digital Culture	7-3	Data Literacy Program – training and education.					x		
7-Digital Culture	7-4	Digital showcase program – share internal digital successes.					x		
7-Digital Culture	7-5	Develop consistent library of technology skills to be incorporated into new job descriptions.				x			
7-Digital Culture	7-6	Update all City job descriptions to include IT and digital skills.						x	
8-Digital Organization	8-1	Formalize and communicate IT Operating / Organizational Model and corporate standards and RACI model for CIT and departments.			x	x			
8-Digital Organization	8-2	Review CIT Manager role and consider establishing the role formally as CIT Director.			x				
8-Digital Organization	8-3	Review CIT supervisor roles – consider re-defining roles as Management level positions and implement other recommended CIT organization changes.			x				

Work Stream	Proj #	Initiative	CapEx. (000's)	OpEx. (000's)	2021	2022	2023	2024	2025
8-Digital Organization	8-4	Budget requests to add resources annually to CIT based on priorities determined at IDT Governance.			x	x	x	x	
8-Digital Organization	8-5	Implement IT Operating Model changes, including aligning positions with CIT.			x				
8-Digital Organization	8-6	Incorporate requirements to capitally fund technology and SME secondments of staff to support large technology projects in 2023 budget year.				x			
8-Digital Organization	8-7	Setup IT Roster (resources-on-demand) model for key platforms.				x			
8-Digital Organization	8-8	Mentoring and IT Management training.				x	x		
8-Digital Organization	8-9	Embrace agile approaches to projects (prototypes, MVPs, modular projects).		20		x	x		
8-Digital Organization	8-10	InOps and CIT will document and review departmental IT and OT technologies, including accountabilities, roles, responsibilities and decision-making authorities for water and wastewater services and report any recommendations to the IDTG and EMT for approval				x			

Appendix E – Operational Improvements

In addition to the strategic recommendations, a series of tactical recommendations are also made for CIT Management to consider.

IT Service Management (ITSM)

A series of recommendations are made around the CIT Division's approach to ITSM. These recommendations include:

- Adopting ITIL as the de facto standard to drive ITSM within IT and ensure application consistently across all teams.
  - Training all IT staff on ITIL foundations.
  - Formalizing the Incident and Problem Management processes (with associated communication with business units about new standards).
    - Defining service standards and expectations and reporting levels.
  - Formalizing the change management process and applying it consistently across all teams.
- Building an IT Service Catalog and developing a user-friendly interface to allow customers to easily interact with and query the catalog.
- Consolidating all documentation into a single knowledge base and exposing the knowledge base to customers to encourage self-service.
- Focusing attention on improving documentation.
  - Conducting a review of key documentation, identifying gaps and prioritizing areas for focused effort.
  - Defining a go-forward standard for "documentation".
  - Establishing a process for identifying, assigning, writing and peer reviewing documentation.
  - Planning for "documentation days" throughout the year.
- Automating, where possible, the service request process (e.g., device ordering).
- Automating, where possible, the incident handling process (e.g., password resets, software installation).
- Implementing an annual customer service survey (modelled on the baseline survey used for this Digital Strategy).
- Reviewing the suitability and effectiveness of the current "out-of-hours coverage" model with service areas and develop options / recommendations for changes.

IT Business Relationship Management

The CIT Division should establish business relationship management responsibilities within CIT (distributed among the management team) which involves:

- A playbook that assures consistent business relationship management and provides a basis for process improvement.
- Communicating the principles of IT Partnership to all CIT staff.
- Active participation of CIT business relationship managers with all divisions during the annual City "Work Plan" process to partner in assuring technology projects.
- Regular service reviews with division leaders to:
    - Discuss current department activities / business pressures / change initiatives.
    - Review previous period service requests and incidents covering performance, trends, recurring issues and outstanding issues.
    - Review previous period changes, if any.
    - Review current project portfolio status for the client's projects.
    - Discuss any corporate project portfolio items that may impact the client department (resourcing, process changes).
    - Discuss any emerging / business problems / potential solution opportunities.
    - Discuss any other business.
- Being available for contact throughout the year.
- A quarterly CIT Director / GM service review program.

IT Team Training

The CIT Division should improve its approach to training, with a focus on:

- Conducting a competency and skills assessment (e.g., ICTC of SFIA competencies) across the CIT Team to identify current competencies, gaps and future needs.
- Establishing a training and development program to target key gaps and needs.
- Developing and communicating clear career paths for CIT staff.
- Working with staff to develop personal development goals.
- Funding and executing an IT training program (as part of capital projects and through operating funding) with an initial focus on the key frameworks being adopted: IT Service Management (ITIL), Project Management (PMBOK), Change Management (ADKAR) and Architecture (TOGAF).

IT Communications

The CIT Division should improve its approach to communication, with a focus on:

- Developing an ongoing marketing and communications plan for IT to the rest of the organization to raise the profile of IT and position it as an enabler, a doer and to communicate the change in IT's style and approach.
- Submitting projects for awards (e.g., MISA, GTECH) to externally validate and celebrate successes.
- Reviewing and revising the tactical communications plan for handling City-wide communications regarding outages, planned maintenance, etc.
- Developing a common (best practice) approach, to be incorporated into the project management framework to communicating and socializing new technology solutions and capabilities (e.g., large file handling).

Purchasing

Government technology procurement is changing, led by new approaches pioneered by 18F in the US and GDS in the UK – to widen the pool of vendors, speed procurement and get improved outcomes, while complying with suitable regulation.

Furthermore, technology rosters – used by both provincial and federal governments – are increasingly used by municipalities.

IT and procurement groups should work together to explore how they can leverage new procurement avenues and approaches.

Application Management

Application management practices could be improved by:

- Developing multi-year application roadmaps in partnership with governance teams.
- Adopting a release management approach for enterprise solutions (with governance teams identifying and prioritizing work for releases).
- Instituting development standards and continuing work to re-platform critical business solutions in the context of strategic plans (e.g., LPMS systems replacement).
- Continuing to maintain development skills in-house, with a de-emphasis of building standalone solutions and a focus on utilizing existing enterprise platforms.

Contract And Vendor Management Program

Contract and vendor management practices could be improved by:

- Maintaining a single online, secure repository of all contracts.
- Establishing an annual contract review program.
- Allocating vendor and partner management responsibilities to IT functional managers with clear responsibilities.
- Actively engaging with vendors / partners with Program Committees on a (minimum) annual basis (to review roadmap and new opportunities).

Tech Savvy Staff Forum

It is recommended that, in addition to the governance process, the City institute a Tech Savvy Staff forum that the CIT Division can use for input to its service delivery plans.

A quarterly, open meeting of technology savvy staff from across the organization could:

- Discuss and provide input to IT plans and roadmaps.
- Discuss barriers and challenges that the CIT Division and IT systems create to business units.
- Brainstorm solutions to the barriers.
- Identify other areas of potential opportunity.

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