IT Strategic Plan

Middlesex County – Information Technology Services

January 2023

FINAL

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INTRODUCTION

Glossary and Acronyms

Acronym	Definition
AD	Active Directory
BCP	Business Continuity Plan
CMDB	Configuration Management Database
CPU	Central Processing Unit
DC	Data Centre
DNS	Domain Name System
DRP	Disaster Recovery Plan
GMT	Greenwich Mean Time
GPO	Group Policy Object
HR	Human Resource
HRIS	Human Resource Information System
HVAC	Heating, Ventilation, and Air Conditioning
IMAC	Install, Move, Add, Change
IOS	Device Operating System
IT	Information Technology
ITSP	Information Technology Strategic Plan

Acronym	Definition
KPIs	Key Performance Indicators
LAN	Local Area Network
MS	Microsoft
SAN	Storage Area Network
SCADA	Supervisory Control And Data Acquisition
SOP	Standard Operating Procedure
SPOC	Single Point of Contact
UPS	Uninterrupted Power Supply
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
WAN	Wide Area Network

Context

Purpose

This document is the culmination of work undertaken by the Corporation of the County of Middlesex (County or we) between September 2022 and January 2022 to review Information Technology Services (ITS) service delivery and develop a multi-year IT Strategic Plan (ITSP). Funding for this project was provided under the Province of Ontario's Municipal Modernization Program.

This document represents one of the key outputs from the project – the County's five-year ITSP.

Approach

Development of the ITSP was highly collaborative, engaging senior management and staff from all departments of the County, Middlesex-London Paramedic Service and lower tier municipalities that use County IT Services.

- The County
- Township of Adelaide Metcalfe
- Township of Lucan Biddulph
- Municipality of Middlesex Centre
- Municipality of North Middlesex
- Municipality of Southwest Middlesex
- Municipality of Thames Centre

The overall approach was, by design, driven from a non-technical perspective to ensure alignment with the needs of the residents and staff and lower tiers that use County IT services. The approach was broken into four phases outlined to the right.

IT Strategic Priorities

Technology is a key enabler for the County and ITS customers to achieve many of their objectives including the Provinces modernization goals. Given the current state and corporate priorities there are ten strategic priorities of which ITS will focus on over the coming years.

As per the modernization requirements, the impact of these initiatives will result in approximately $251k in savings and reduced costs over a five-year period.

The following pages provide a summary of each of the initaitives.

	**1. Revise ITS Service Agreements**
	**2. Develop Modernization Plans**
	**3. Create an Application Architecture**
	**4. Develop Technology Literacy Programs**
	**5. Revise ITS Documentation Standards**
	**6. Build and Execute a Technology Migration Plan**
	**7. Enhance ITS Governance**
	**8. Revise Service Continuity Practices**
	**9. Enhance ITS' Service Delivery**
	**10. Revise ITS Service Desk Practices**

Summary of Initiatives (1/3)

Initiatives	Activities	Benefits
1. Revise ITS Service Agreements	Step 1 – Revise Service Descriptions and Service Levels Step 2 – Create New Pricing Model Step 3 – Update Contractual Terms Step 4 – Draft New Agreements	▸ Updates to the service agreement will provide more structure and clarify expectations. ▸ A new pricing model will help ensure ITS is able to keep up with raising costs and make sure it is equitable across all its customers.
2. Develop Modernization Plans	Step 1 – Assess Customers Needs Step 2 – Identify Solutions and Economies of Scale Step 3 – Draft Modernization Plan Step 4 – Execute and Monitor	▸ Cost-savings from economies of scale in procurement, implementation, and operation of new systems. ▸ Increased customer capacity and efficiency.
3. Create an Application Architecture	Step 1 – Develop a Conceptual Data Model Step 2 – Create Customer Specific Diagrams Step 3 – Include Future Changes Step 4 – Update as Required	▸ It can optimize the architecture to help ITS customers achieve greater staff efficiency from using technology. ▸ It can help ITS manage workload and future planning decisions.
4. Develop Technology Literacy Programs	Step 1 – Learning Needs Assessment Step 2 – Gap Analysis Step 3 – Develop Technology Literacy Program Step 4 – Monitor Impact	▸ Improved knowledge and expertise for staff. ▸ Better understanding of current and new technologies and how to take advantage of them. ▸ There is less risk of mistakes as staff are more knowledgeable.

Summary of Initiatives (2/3)

Initiatives	Activities	Benefits
5. Revise ITS Documentation Standards	Step 1 – Separate Physical and Logical Step 2 – Create Site Specific Diagrams Step 3 – Update as Required	▸ Separating the network diagrams will make it easier for ITS to share information with partners in the future and reduce the risk of sharing too much information. ▸ As the network becomes more complex, segmenting the documentation will make it easier to use internally.
6. Build and Execute a Technology Migration Plan	Step 1 – Identify Move Groups Step 2 – Define Move Criteria Step 3 – Determine Migration Approach and Detailed Plan Step 4 – Execute Plan	▸ Centralizing workloads will improve resiliency of ITS customer systems. ▸ It will provide some cost savings relating to server infrastructure and storage services. ▸ It will reduce the need for ITS staff to be on-site to address physical issues.
7. Enhance ITS Governance	Step 1 – Design Governance Model Step 2 – Hold Quarterly Progress Meetings Step 3 – Hold Strategic Planning Sessions Step 4 – Conduct Customer Satisfaction Reviews	▸ More predictable planning can help reduce unexpected costs and identify opportunities to coordinate on broader initiatives. ▸ Formalized governance will help ITS be more responsive to customer needs.

Summary of Initiatives (3/3)

Initiatives	Activities	Benefits
8. Revise Service Continuity Practices	Step 1 – Fill out Department BCPs Step 2 – Revise ITS' Continuity Management Documents Step 3 – Fully Test the Business Continuity Plan Step 4 – Regularly Review and Revise the IRP and BCDRP	▸ Having up to date documentation will help mitigate the risk of a failed recovery. ▸ ITS can more efficiently handle disruptions. ▸ Reduce the potential downtime of the County and ITS customers.
9. Enhance ITS' Service Delivery	Step 1 – Monitor ITS Workload Step 2 – Address Resource Requirements Step 3 – Address Capability Gaps Step 4 – Work with HR to Determine Succession Plan	▸ ITS will have a clear plan for evolving the IT capability / capacity. ▸ Improved continuity to minimize any interruptions due to workforce changes. ▸ Improved motivation for employees to stay in organization.
10. Revise ITS Service Desk Practices	Step 1 – Revise IT Processes Step 2 – Increase Service Desk Staffing Levels Step 3 – Improve Self-service Capabilities Step 4 – Monitor Progress and Revise as Needed	▸ Faster issue resolution and improved ITS customer satisfaction. ▸ Greater capacity to handle increased demand. ▸ Improved resiliency (backup in case a service desk analyst goes on vacation or off on sick leave). ▸ Improved communication and service expectations for users.

Implementation Roadmap

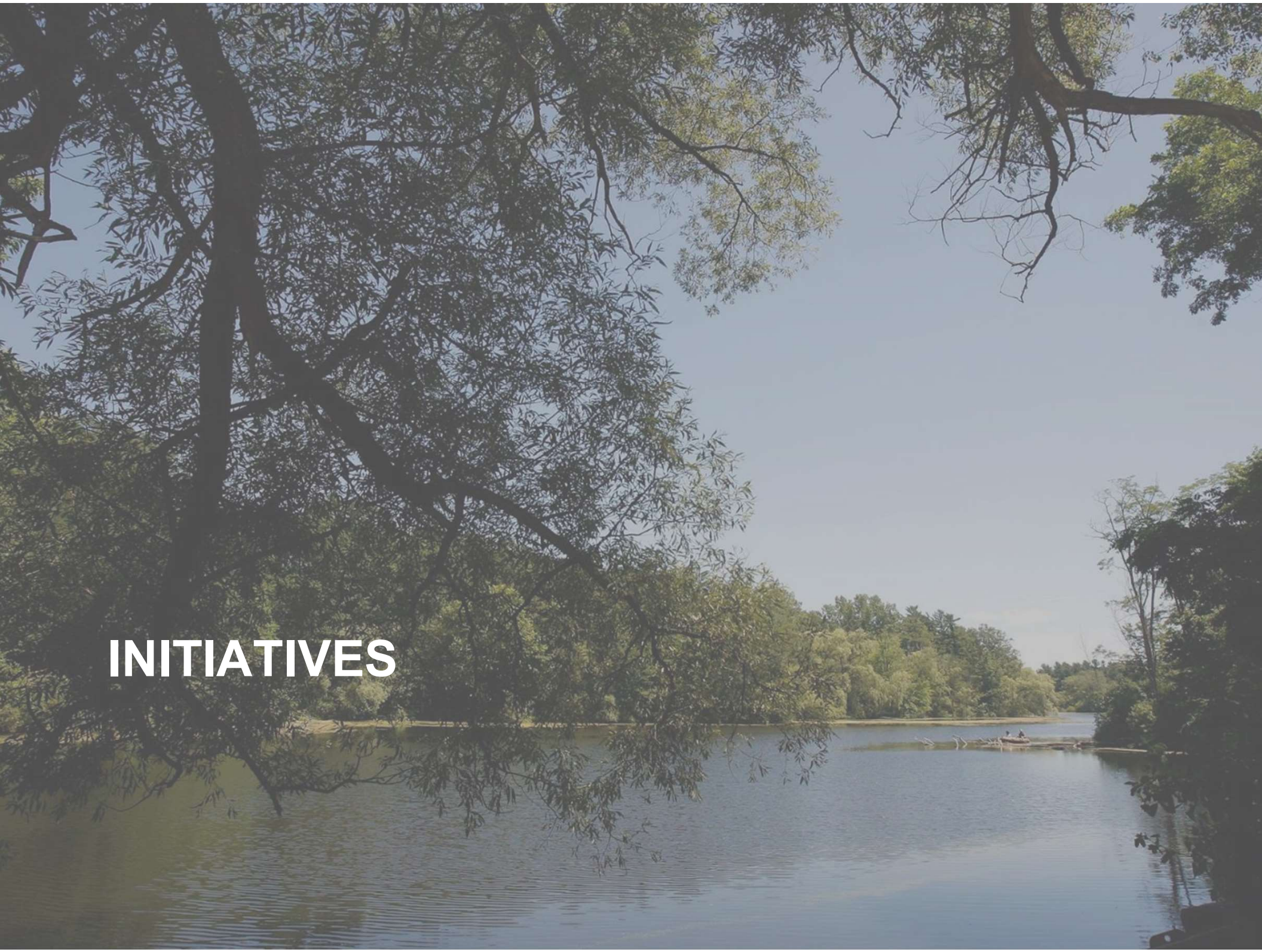
The implementation has been phased over five years

Below is a proposed implementation plan, taking into consideration urgency, dependencies and estimated effort. We recommend that following acceptance of this report, ITS will (where necessary) validate the supporting assumptions, develop more detailed implementation plans and create capital projects to implement those recommendations deemed appropriate.

	2023		2024		2025		2026		2027	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
1. Revise ITS Service Agreements	■									
2. Develop Modernization Plans			■		■		■		■	
3. Create an Application Architecture		■								
4. Develop Technology Literacy Programs			■	■						
5. Revise ITS Documentation Standards		■								
6. Build and Execute a Technology Migration Plan	■	■	■	■						
7. Enhance ITS Governance	■									
8. Revise Service Continuity Practices				■	■	■				
9. Enhance ITS' Service Delivery	■	■								
10. Revise ITS Service Desk Practices	■									

Note:

We assume that the approval of the above initiatives and funding will occur as part of the County's annual budget process and any lower tier using ITS.



INITIATIVES

1. Revise ITS Service Agreements (1/2)

Current Situation

- The scope of service ITS provides is fairly consistent focusing on day-to-day IT needs. ITS provide services to several other lower tier organizations (customers). However, the service agreements are dated - service descriptions does not accurate capture ITS' service delivery.
- In addition, ITS pricing model needs refinement to bring it up to modern standards.

Recommendation

- Revise the service agreements to be more in-line with common practices. Specifically updating the service descriptions and service levels.
- Revise the pricing model to be more equitable and recover a large percent of ITS' service delivery expense.

Approach

Step 1 – Revise Service Descriptions and Service Levels

- ITS will use its newly formed IT Service Catalogue (See Appendix A) as a basis for new service descriptions to go into its service agreements.
- Newly identified service levels will need to be tested to validate their feasibility for ITS to meet. Once validated, ITS can include these new service levels in the service agreements.

Step 2 – Create New Pricing Model

- ITS will review the existing fixed fee pricing model compare it with two others – a variable driven model (e.g. price / staff) and a hybrid (part fixed part variable). ITS will consider the pros / cons of each model (particularly the effort to manage the models) and determine the most appropriate model to use going forward.
- In addition, ITS will use existing cost data to create a cost-plus price for its services.

Step 3 – Update Contractual Terms

- In addition, ITS will update the service agreements to bring it more in-line with common practices. Particularly adding new terms for:
  - Including formal triggers to renegotiate price based on volume changes.
  - Including incentives or penalties for service level exceptions.
  - Describing the governance and reporting requirements of ITS.
  - Updates to the pricing model.

Step 4 – Draft New Agreements

- ITS will work with procurement and an advisor to update the service agreements leveraging the outputs from Steps 1-3. Once complete ITS will work with its Customers to agree on the new terms and replace the existing agreements.

1. Revise ITS Service Agreements (2/2)

Dependencies

- This initiative does not have any dependencies.

Assumptions

- ITS will use its newly formed IT Service Catalogue as a basis for the changes to the service agreement.
- ITS may require some additional external assistance to create the new service agreements.
- The pricing model adjustments will be phased in over a period of time to help ensure customers are able to adjust.
- ITS will be able to perform the renegotiations using internal resources.

Risks

- The price increases are too high, and ITS customers will not renew.
- Customer renegotiation will be contingent on ITS being able to improve service desk service levels.

Benefits

- Updates to the service agreement will provide more structure and clarify expectations.
- A new pricing model will help ensure ITS is able to keep up with raising costs and make sure it is equitable across all its customers.

2. Develop Modernization Plans (1/3)

Current Situation

- Over the past years, the County and the lower-tier municipalities have used modernization grants to implement new systems and take advantage of economies of scale. The new systems include document management systems, asset management systems, and enterprise resourcing systems. However, further opportunity exists to expand the functionality of current systems, such as Laserfiche for document management and process automation.
- Other areas, including customer relationship management and recreations have potential to implement new systems, taking advantage of economies of scales and providing additional capabilities and automation.

Recommendation

- Continue working with ITS customers to develop a modernization plan that aims to increase automation and achieve economies of scale where possible.

Approach

Step 1 – Assess Customers Needs

- Establish a standardized process for gathering information from ITS customers to assess their system needs.
- Incorporate modernization planning into the annual budgeting process to establish a set frequency for confirming budgeting allocations and details. The agenda should include the following items:
  - Scope of the modernization plan, such as whether it involves developing a new plan or reviewing and modifying existing plans
  - The identified topics of interest for the modernization plan
  - Inputs to the modernization plan, including a current state analysis and trends
  - The duration and schedule of the session
  - The attendees for the session

2. Develop Modernization Plans (2/3)

Step 2 – Identify Solutions and Economies of Scale

- Using the details of Step 1, identify common issues that ITS customers share to develop opportunities for new shared technologies and systems.
- Discuss opportunities and benefits of implementing solutions collectively versus individually, with a focus on how shared services can lead to reduced costs and improved systems and services for all clients. For example:
  - Sharing staff resources as a joint effort during the procurement regardless of outcome (meaning each ITS customer may still pick a different solution)
  - Sharing the same solution to reduce implementation costs and potentially lower hardware / software costs
- Prioritize common issues and set a timeline for implementation.

Step 3 – Draft Modernization Plan

- ITS should work with its customers to develop an overall modernization plan that includes individual specific initaitives as well as shared. For ITS customers that already have a modernization plan / IT Strategy, ITS should propose improvements and updates based on the assessments from Steps 1 and Step 2.
- Confirm the participating ITS customers, their financial capacity, cost allocations, and the schedule for rolling out new software systems.
- Obtain approvals from stakeholders and complete the review/sign-off process.

Step 4 – Execute and Monitor

- Execute the plan and monitor progress of the modernization plan as part of ITS' governance structure with its customers.
- Review and update the plan as required, or no less than once a year.

2. Develop Modernization Plans (3/3)

Dependencies

- Initiative #7 to ensure appropriate governance in decision-making and ongoing monitoring of performance.
- Initiative #8 as it may have an impact on the timing of certain modernization opportunities.

Assumptions

- ITS customers are willing to coordinate and work together.
- ITS has capacity to facilitate the development of the modernization plans.
- ITS customers have similar procurement guidelines.
- Cost savings are contingent on ITS customers agreeing to modernization changes.
- Cost savings will impact ITS customer expenses not ITS expenses.

Risks

- Customers do not reach consensus on coordination reducing the benefit of sharing.

Benefits

- Cost-savings from economies of scale in procurement, implementation, and operation of new systems. See Appendix B for estimates of cost savings.
- Increased customer capacity and efficiency.

3. Create an Application Architecture (1/2)

Current Situation

- The County currently has a best of breed approach. This means departments are adopting systems which are best suited for their needs.
- ITS does not currently maintain an application architecture for the County or its customers. Lack of an application architecture can lead to missed opportunities (integration, automation).
- Additionally, data will continue to be an important asset that departments will use to provide resident services and operate effectively.

Recommendation

- Create an application architecture of the County and ideally ITS' customers. Map out key points of integration (or desired integration) between systems.

Approach

Step 1 – Develop a Conceptual Data Model

- Develop a conceptual data model to identify the top-level information about each department. Then map the relationships between the entities. This will provide ITS with a common model for each municipality and while some aspects will be different (upper / lower tier) many will be similar. It will also provide a functional view of the data across a municipality.

Step 2 – Create Customer Specific Diagrams

- Create standards for architecture diagrams and a consistent tool for documenting it (e.g., Microsoft Visio).
- Using the data model and system information, create customer specific architecture diagrams. These diagrams should include the system name, indicate data flows (manual, automated, whether its real-time or batch, and the data direction (uni or bi).

Step 3 – Include Future Changes

- Once the diagrams are complete, ITS should overlay any future plans (e.g., new systems or system replacements) as well as identify any future areas of opportunity (e.g., integration between systems). This should include the website as this has become a primary layer of interaction for residents to receive certain services.
- When documenting architecture, ITS should consider all Cloud systems used by its customers in addition to on-premise systems.

Step 4 – Update as Required

- Update the diagrams as the architecture changes or on a set frequency (no less than annually).

3. Create an Application Architecture (2/2)

Dependencies

- Ensure this recommendation aligns with future modernization plans County or ITS customers have.

Assumptions

- IT has the capability and internal capacity to perform this initiative

Risks

- ITS is unable to meet predetermined deadline due to resource constraints.

Benefits

- It can optimize the architecture to help ITS customers achieve greater staff efficiency from using technology.
- It can help ITS manage workload and future planning decisions.

4. Develop Technology Literacy Programs (1/2)

Current Situation

- Oftentimes, systems may be underutilized due to a lack of awareness on how to use a system to its full extent. Analysis indicates there is a desire for greater system training with new and existing staff to overcome these limitations.
- Most ITS tickets relate to application and system support. As ITS customers invests in new systems and technologies, it is important there is appropriate training to get the most out the systems and to reduce system-related tickets.

Recommendation

- Work with ITS' customers to develop a technology literacy program for staff.

Approach

Step 1 – Learning Needs Assessment

- ITS will work with its customers to create a list of all the systems and technologies they use.
- ITS should collaborate with its customer's HR representatives to understand outliers who may need more attention to develop their understanding of the systems and technologies. HR should undergo a departmental assessment to better understand how to train these outliers. The assessment may use different approaches such as:
  - Testing
  - Interviews
  - Surveys
- ITS should also include any future technology changes (e.g., new systems or devices like an HRIS) staff will be using.
- The output of this assessment should be a list of necessary skills and expertise staff will need to perform their job today and the near future.

Step 2 – Gap Analysis

- Following the joint HR assessment, HR should undertake a gap analysis to determine which areas of training staff will require. ITS should advise as required.

4. Develop Technology Literacy Programs (2/2)

Step 3 – Develop Technology Literacy Program

- HR representatives, with the help of ITS, should develop a program which covers, at minimum, the following:
  - M365 Office training
  - Key program training specified for each organization
  - Introduction to new technology / systems
  - Security and cyber security awareness
  - Onboard training
  - Annual refresh training package
  - Guidelines to adopting new technologies
- The literacy program will consider be customized to job descriptions, responsibilities and use of technology. For example, field staff will have a different technology literacy program than those in the finance department.

Step 4 – Monitor Impact

- ITS and HR should develop KPIs to monitor the success of the literacy program and adapt it as required. For example, a decrease in IT tickets related to system and application support.
- HR representative should be responsible for assessing staff learning and ensuring programs maintain relevancy for current and future technology. This may also result in updating hiring practices to test the literacy of staff.

Dependencies

- None.

Assumptions

- ITS and its customers have the capability and capacity to implement this initiative. Therefore, it will not require third-party resources.

Risks

- Without monitoring the results and refreshing the program ITS and the customers may not realize the full benefits.

Benefits

- Improved knowledge and expertise for staff.
- Better understanding of current and new technologies and how to take advantage of them.
- There is less risk of mistakes as staff are more knowledgeable.

5. Revise ITS Documentation Standards (1/1)

Current Situation

- Network architecture diagrams exist and are well documented. This is extremely important. However, opportunities exist to refine the structure of the documentation.

Recommendation

- Redesign the network architecture documentation to split it by WAN, LAN so that it is easier to use.

Approach

Step 1 – Separate Physical and Logical

- Using the existing architecture diagram, create a physical layer in a separate document (or tab).

Step 2 – Create Site Specific Diagrams

- For each customer, create a network diagram that outlines the internet connection, physical / logical network devices. Consider illustrating additional information e.g. bandwidth, connection media, VLANs, etc.

Step 3 – Update as Required

- Update the diagrams as the network changes or on a set frequency (no less than annually).

Dependencies

- This initiative does not have any dependencies.

Assumptions

- ITS has the information and capabilities to perform this work internally.

Risks

- None.

Benefits

- Separating the network diagrams will make it easier for ITS to share information with partners in the future and reduce the risk of sharing too much information.
- As the network becomes more complex, segmenting the documentation will make it easier to use internally.

6. Build and Execute a Technology Migration Plan (1/2)

Current Situation

- Most ITS customers have their workload (systems and storage) locally on-premise. These servers are spread out across the region which impacts their accessibility for maintenance. In addition, ITS customers do not have a purpose-built computer room or the level or resiliency the ITS data centre has to offer.
- There are currently plans to move some of the lower tier municipality servers (such as Middlesex Centre's) into the County ITS facilities in the near future.

Recommendation

- ITS should work with its customers to build a roadmap to move (to the extent possible) all customer servers / storage into the Data Centre (DC) or the cloud.

Approach

Step 1 – Identify Move Groups

- Using existing data, ITS should begin developing move groups for each of its customers. This analysis should consider, the systems residing on the servers, whether they are physical or virtual, age, operating system, utilization and any dependencies they have with other systems or software.
- Next, ITS will need to determine if there are any constraints or barriers for moving the equipment. This may include issues with the software working over the WAN, network latency, a requirement to have it on a physical server or a specific version of operating system.

Step 2 – Define Move Criteria

- To help ensure moving any infrastructure does not increase the risk to the County or other ITS customers, ITS should define entrance criteria. This criteria will consider security, currency of systems (both physical age and operating system), etc. ITS may wish to perform a risk assessment per ITS customer prior to determining what move approach is best suited given the available information and timing.
- Once ITS has defined this it will be able to determine the migration approach.

6. Build and Execute a Technology Migration Plan (2/2)

Step 3 – Determine Migration Approach and Detailed Plan

- Generally ITS will evaluate three move options:
  - Move the workload as-is into the ITS DC
  - Move the workload from onto new equipment in the ITS DC
  - Move the workload to the cloud
- Each of the above have pros / cons and will be determined by ITS based on the information from Step 1 and 2.
- At this point ITS will be able to develop individual ITS customer migration plans as well as a roll up of all the plans into a master migration plan.
- ITS will then meet with its customers to determine suitable timing and any potential downtime.
- ITS will work with its customers to develop testing criteria and involvement of ITS customers.
- In addition, ITS will create rollback procedures and criteria in case something unforeseen occurs and the migration is no longer possible.

Step 4 – Execute Plan

- Once the plans are approved ITS can begin execution and monitor the results.

Dependencies

- No other initiatives.

Assumptions

- Customers are willing to transfer responsibility of systems / servers to County.
- County ITS has the capacity and capability to develop and execute the plans.
- No additional equipment is required to move ITS customer workload to the County DC.

Risks

- If customers are unwilling to transfer servers and storage to County, ITS may need to allocate further resources to offer on-premise support and server maintenance.

Benefits

- Centralizing workloads will improve resiliency of ITS customer systems.
- It will provide some cost savings relating to server infrastructure and storage services. See Appendix B for estimates of cost savings.
- It will reduce the need for ITS staff to be on-site to address physical issues.

7. Enhance ITS Governance (1/2)

Current Situation

- ITS participates in meetings with its customers but the frequency and structure of these meetings are not formally specified. Lack of formal communications can lead to missed opportunities as ITS's resources are unable to keep up with demand or discuss priorities.

Recommendation

- ITS should enhance its governance model. This should include a more formal internal structure for ITS as well as formalizing collaboration with Customers.

Approach

Step 1 – Design Governance Model

- To help ensure the model is fit-for-purpose and not too onerous on both the customer and it's the initial focus of the governance model will address key aspects to manage ITS services, including:
  - Prioritization of projects and budgeting
  - IT performance / progress
  - Future changes (forward schedule of change)
  - Any areas for escalation
- ITS will define the meeting agenda, develop a dashboard for reporting purposes and work with ITS customers to discuss how best to structure the meeting e.g. add this agenda to an existing meeting or create a new one.

Step 2 – Hold Quarterly Progress Meetings

- Quarterly, schedule progress meetings with the Customers' representatives. Discuss any issues or challenges with progress on current initiatives (e.g., server consolidation with ITS' municipal Customers).
- Discuss any concerns with service level targets or other day-to-day operational matters.
- Document any action items and schedule the following quarterly progress meeting.

Step 3 – Hold Annual Strategic Planning Sessions

- ITS currently assists its customers with setting IT budgets. As part of formalizing ITS' partnerships it should expand on these sessions and hold annual planning meetings with representatives from each customer organization. Key objectives for these sessions should be:
  - Reviewing service over the past year
  - Scope of ITS services for the next year (should service be expanded to include anything new? Have service volumes changed substantially?)
  - Any action items related to longer term projects / initiatives
  - Establishing customer IT budgets
- The output of this session is to help inform the development of modernization plans, changes to the service agreements and an input into budgets.

7. Enhance ITS Governance (2/2)

Step 4 – Conduct Customer Satisfaction Reviews

- Annually ITS will conduct a customer satisfaction survey to illicit feedback. The scope of the survey will cover all aspects of the services ITS provides. The survey will be available to all staff levels (management and staff).
- Additionally, a subset of the survey will be just for management to focus on governance, strategy and risk.
- ITS will collate the data, review, analyze and present it back to ITS customers and discuss any potential changes that ITS will undertake.

Dependencies

- No other initiatives.

Assumptions

- ITS will be able to create the governance model using internal resources. This includes the development of a dashboard.
- Additional effort to develop and produce the dashboard will be minimal and leverage existing system data that ITS uses.

Risks

- The governance model frequency is not appropriate (too soon / too late between meetings) causing it to be ineffective.

Benefits

- More predictable planning can help reduce unexpected costs and identify opportunities to coordinate on broader initiatives.
- Formalized governance will help ITS be more responsive to customer needs.

8. Revise Service Continuity Practices (1/2)

Current Situation

- ITS' continuity management is comprised of three components:
  - Information Security Incident Response Plan (IRP)
  - Business Continuity / Disaster Recover Program (BCDRP)
  - Department Business Continuity Plans (BCP)
- There is little linkage between the three components, making it potentially difficult to manage an event. In addition, the department BCPs have missing information and evidence suggests they have not been fully tested.

Recommendation

- ITS will revise its service continuity practices. This will include regularly testing the general BCDRP along with its department specific continuity plans.

Approach

Step 1 – Fill out Department BCPs

- Complete the department BCPs and ensure all customer BCPs are up-to-date, complete and accurate.

Step 2 – Revise ITS' Continuity Management Documents

- Revise ITS' documentation to ensure it aligns with the BCP requirements.
- In addition, address any noted deficiencies from the analysis done by Blackline Consulting.
- Once the documentation is up-to-date, review and finalize the documents.

Step 3 – Fully Test the Business Continuity Plan

- Define a scenario for testing the BCP and DRP.
- Schedule the testing and coordinate with ITS customers.
- Perform the scenario, capture the test results and perform a lessons learnt.
- Make the agreed changes to improve ITS and ITS customers' service continuity.

Step 4 – Regularly Review and Revise the IRP and BCDRP

- Perform BCP tests on a set frequency as outlined in the revised BCDRP. Update the BCDRP and IRP as needed based on the findings from testing.

8. Revise Service Continuity Practices (2/2)

Dependencies

- Initiative #6 as it will substantially change the DRP activities. #6 takes longer than two years, then ITS should test its disaster response and business continuity plan with the lower tier municipalities. Otherwise it will wait until #6 is complete before fully testing.
- Likely dependent on the outcome of the cyber review the County is currently completing. The findings of that work should be incorporated into any new service continuity documentation as is applicable.

Assumptions

- ITS will complete its BCP testing with internal resources.
- Revisions to any business continuity documentation will be completed by ITS and County staff (e.g., for departmental BCPs).
- ITS will not require any additional hardware or software to meet its business continuity needs.

Risks

- ITS may not have the IT security expertise required for major revisions to its BCDRP / IRP. If major issues are found through the course of this work ITS may need to hire external resources.

Benefits

- Having up to date documentation will help mitigate the risk of a failed recovery.
- ITS can more efficiently handle disruptions.
- Reduce the potential downtime of the County and ITS customers.

9. Enhance ITS' Service Delivery (1/2)

Current Situation

- Generally, ITS staff have strong technical skills, however, may require greater attention to training and upskilling to ensure they are ready to transition to a future ready department. Capability gaps exist primarily in two areas: application / data architecture and security. Both will be increasingly important as ITS customers adopt more technology.
- In addition, overtime and analysis of work volume indicate a pending need for additional resources. It may also be difficult to hire individuals with similar skillset and expertise.

Recommendation

- ITS should consider addressing the capabilities gap with a formal succession / learning plan for ITS staff.

Approach

Step 1 – Monitor ITS Workload

- ITS will measure key indicators to understand when / if they require further resources and the type of resources. Indicators include (but not limited to):
  - ITS staff as a percent of total staff
  - ITS spend (operating expense) as a percent of total operating expense (including customers)
  - Amount of IT staff overtime / time-in-lieu
  - # of projects involving ITS
  - Volume of tickets / year / ITS service desk staff

Step 2 – Address Resource Requirements

- As per Initiative #10, ITS should work with HR to begin the recruitment process to find a Service Desk Analyst.
- Based on Step 1, within the next five years ITS may also require a Project Manager (depending on work volume). This role would likely have dual function, managing projects as well as subordinates such as Business Analyst.

Step 3 – Address Capability Gaps

- ITS will develop its capabilities in two key areas: application / data architecture and security. ITS will work with HR to develop learning plans to assist appropriate ITS staff to address these capability gaps. This may also require HR to revise certain ITS job descriptions.

Step 4 – Work with HR to Determine Succession Plan

- ITS will work with HR to develop a succession plan. This plan will include an assessment of ITS' current staff, their capability, performance and their career aspirations. The plan will also consider whether any:
  - key person dependencies exist
  - knowledge concentration risks
  - flight risks
- The plan will outline succession activities and monitor them accordingly over time to make sure they are kept up-to-date.

9. Enhance ITS' Service Delivery (2/2)

Dependencies

- No other initiatives.

Assumptions

- The County will perform this initiative using internal resources.

Risks

- HR does not have the capability to help ITS perform this initiative.
- ITS staff do not have sufficient time to take training.

Benefits

- ITS will have a clear plan for evolving the technical capability / capacity.
- Improved continuity to minimize any interruptions due to workforce changes.
- Improved motivation for employees to stay in organization.

10. Revise ITS Service Desk Practices (1/3)

Current Situation

- The ITS service desk is a service provided to the County and other municipal customers. The cost of providing this service is recovered through fees.
- Survey results indicate that while staff are happy with the quality and knowledge of ITS staff, timeliness is a concern, with ITS receiving more tickets than it is resolving. The ticket backlog has been steadily increasing to about 350 incident tickets and 71 service request tickets by September 2022.
- This impacts the ability of ITS to meet its service level targets. Especially important is the median resolution time for urgent incident tickets, at 9 hours versus the targeted 4 hours. Through distinguishing ticket volume by priority, we found that there are few tickets categorized as High or Medium priority.
- Demands for on-site service desk staffing have increased recently and are likely to increase in the future, adding additional pressure on service desk capacity.

Recommendation

- Revise ITS practices by streamlining processes, including reducing the number of IT ticket categories from four to three and clearly defining service definitions.
- Increase staffing levels and reduce the number of tickets ITS Management resolves.

Approach

Step 1 – Revise IT Processes

- Improve service desk prioritization of tickets. Revise IT ticket priorities from four categories today to three (low/medium/high).
- Revise the category definitions and service level targets to improve customer expectations.
- Create clear guidelines for how tickets should be classified and prioritized, including setting reasonable expected response times for prioritization and types of users.
- Improve communication to notify users of expected response times and progress. Provide users with access to a portal to view their ticket status and provide regular updates on progress or changes to expected response times. To ensure communication is time-effective, develop standard language and guidance for staff to use when communicating with users.
- Review the ITS service desk knowledgebase for deficiencies and develop Standard Operating Procedures (SOPs) for resolving issues. Identify topics that are not adequately covered, missing, or out of date. Where there are gaps, update and develop new guides and SOPs. Review and test SOPs with staff to ensure that they are accurate, useful, and easy to follow.

10. Revise ITS Service Desk Practices (2/3)

Step 2 – Increase Service Desk Staffing Levels

- Hire an additional staff member to the service desk to help address the growing backlog and address customer concerns about timelines of service.
- Review the service desk model and determine on-site visit frequency. Establish the on-site visits schedule and provide training or resources to ensure that they are prepared to handle the specific issues that they may encounter on-site.
- Ensure the new staff member is supported by the main ITS service desk and has access to management and other resources to support their work and resolve issues.

Step 3 – Improve Self-service Capabilities

- Provide ITS customers with periodic training sessions on common issues that do not require ITS involvement. These sessions should also promote the different ways to contact ITS and promote self-services.
- Update self-service resources (links, guides, step-by-step instructions) for resolving common and simple issues. These resources should be written in a clear, concise manner and should be easy for users to understand and follow. Make guides accessible via the ITS ticketing system or an intranet site.
- Regularly review self-service options to ensure they are accurate, current, and relevant to staff needs.

Step 4 – Monitor Progress and Revise as Needed

- Collect structured feedback from ITS customers to identify service issues and improve service. The survey should include questions that cover key areas such as the quality of service received, the timeliness of ITS responses, and the ease of use of self-service resources.
- Use the insights gained from the feedback to identify and prioritize areas for improvement. Consider if changes are needed to service processes, or if new technologies, tools, training or resources are required.
- Communicate actions taken in response to staff feedback and ensure that improvements are effective in addressing the identified issues.

10. Revise ITS Service Desk Practices (3/3)

Dependencies

- Initiatives #1 and #9. #1 to align service level targets and the ticket categories. #9 for adding the ITS resource and ensure the model is appropriate for ITS going forward.

Assumptions

- Capacity exists to create self-service materials for users.
- ITS staff has the ability to renegotiate service agreements to revise priority levels, service targets, and funding for additional staffing position.
- ITS budget is available and approved to cover additional service desk staff member.

Risks

- Self-service options continue to be underused and do not result in a decrease in ticket volume.
- Service desk volume declines leading to the additional service desk staff member being underused

Benefits

- Faster issue resolution and improved ITS customer satisfaction.
- Greater capacity to handle increased demand.
- Improved resiliency (backup in case a service desk analyst goes on vacation or off on sick leave).
- Improved communication and service expectations for users.

APPENDICES

Appendix A

IT Service Catalogue (1/11)

Service Area	Service
Strategy and Advice	Strategy Design
	Technical Architecture
Service Desk	Service Desk
	Order Desk
End-User Computing	Desk Side Support
	Print Services
	Desktop Hardware Maintenance
Mobile Device Management	Mobile Device Support
Platform Support	Standard Monitoring
	Email and Messaging Administration and Management
	Managed Web Services
	Domain Controller and Active Directory (AD) / AD Azure
	Laserfiche Business Process Automation

Service Area	Service
Infrastructure Management	Storage Management / Backup and Recovery
	Server Support – Operations
Data Centre Services	Data Centre Infrastructure Services
Network Services	Network Connectivity Services
	Manage Remote Access and VPN Services
	Desktop Telephony Service – Teleconferencing (Voice/Video Services)
Security Services	Security Monitoring and Operations
Service Integration	Change and Release Management
	Configuration and Asset Management
	Capacity Management
	Incident and Problem Management
	Disaster Recovery

Appendix A

IT Service Catalogue (2/11)

Service Area	Service	Service Scope	Service Description
Strategy and Advice	**Strategy Design**	Provide advice and guidance to CUSTOMER regarding all aspects of technology as per the Scope of Services.	Service activities include: • Provide advice and guidance to senior management to develop and maintain a multi-year IT strategic plan. • Provide advice and guidance on new technology CUSTOMER should be adopting or piloting • Host a quarterly presentation on technology trends and how CUSTOMER may benefit from adopting them • Provide advice in CUSTOMER's annual budgeting process for new technology • Provide advice in CUSTOMER's strategic planning and use of technology
	Technical Architecture	Provide architectural capabilities covering all aspects of technology (network, infrastructure, applications and data).	Service activities include: • Maintain and update architectural diagrams and details • Develop and adhere to architectural standards

Appendix A

IT Service Catalogue (3/11)

Service Area	Service	Service Scope	Service Description
Service Desk	**Service Desk**	The Service Desk tracks, logs and manages all incidents and service requests. It provides a Single Point of Contact (SPOC) during regular business hours and after hours for End Users who require assistance. Standard hours of operation are: • Prime Service: Monday-Friday 08:00-17:00 GMT • After Hours Support: The Service Desk will provide after-hours IT emergency service. IT Emergencies are defined as, any IT related failure or disruption to network or servers that causes a significant impact on the workflow of its users.	Service activities include: • Receive, record validate, resolve and escalate all Priority tickets • Coordinate with external vendors and partners • Assign tickets following mutually agreed to procedures • Provide ticket status following agreed to procedures • Establish and maintain ticket prioritization guidelines and escalation procedures according to agreed documented procedures • Maintain knowledge management (problem and application recovery data) • Keep the end user updated throughout the lifecycle of the ticket • Participation in evidence gathering for internal and external audits (yearly)
	Order Desk	The Order Desk service provides Asset Management, IMAC and Order Management services. The Order Desk receives, fulfills and closes user requests for the costs, configuration, procurement and delivery of equipment and software required in normal business operations. The Order desk also tracks resources (desktop hardware and software).	Service activities include: • Act as a SPOC during prime shift hours for service requests • Receive, record validate, and fulfill service requests • Coordinate with external vendors and partners • Assign service requests following mutually agreed to procedures • Provide service requests status following agreed to procedures • Establish and maintain request prioritization guidelines and escalation procedures according to agreed documented procedures • Keep the end user updated throughout the lifecycle of the request

Appendix A

IT Service Catalogue (4/11)

Service Area	Service	Service Scope	Service Description
End-User Computing	**Desk Side Support**	To provide assistance for requests that require on-site support. Including desktops, laptops (including Microsoft Surface and other similar devices), peripheral device (e.g. printers, scanners, keyboards, etc.), and meeting rooms.	Service activities include: • Dispatching a technician to provide on-site support • Advice and support for users working in remote sites • Perform IMACs as required
	Print Services	This service includes setup, installation and troubleshooting of the Municipality's printers, scanners or plotters. Where required, this service will also facilitate the coordination of 3rd parties to ensure printers, scanners and plotters are functioning as expected.	Service activities include: • Provide escalation for CUSTOMER issues with print devices and involvement with printer service providers • Coordinating the selection, coordination setup of printer devices • Working with 3rd parties to configure software
	Desktop Hardware Maintenance	Providing Desktop/laptop hardware related services for the duration of hardware lifecycle from build and implementation to ongoing maintenance and operations, planning and scheduling of hardware upgrades and disposal.	Service activities include: • Hardware Upgrade and Refresh • Hardware Problem Resolution • Asset Management • Managing repairs via relevant hardware support provider
Mobile Device Management	**Mobile Device Support**	To provide assistance for requests that require second level support from a technician. Applicable to all mobile devices (e.g. iPhone, Android, etc.). If they are tablet devices that are considered two-in-one (e.g. Microsoft Surface) then devices are managed under the Service Desk/End-User Computing services.	Service activities include: • Perform IMACs • Responsible for the warranty management of devices, and managing faulty equipment • Ensure the physical distribution of mobile devices • Mobile device image management and distribution using local manual (where required) and automated software tools. Working closely with other 3rd parties

Appendix A

IT Service Catalogue (5/11)

Service Area	Service	Service Scope	Service Description
Platform Support	**Standard Monitoring**	ITS will install standard monitoring tools with agreed to thresholds and defined alerts and notify the appropriate support group (ITS or CUSTOMER) when alerts have been triggered. Standard monitoring includes: infrastructure component level, standard infrastructure and (where required and agreed application). ITS shall provide 7x24 server support and monitoring.	Service activities include: • Maintain standard list of monitors • Alert tracking and identification • Execute daily, weekly, monthly or yearly checklists for supported services • Report on Health Checking results • Check that the required access and activity logs data do exist
	Email and Messaging Administration and Management	The MS Exchange Administration and Management Service provides for the day-to-day administration and management of an MS Exchange organization(s) including MS Teams. This includes the hosting (where applicable) or cloud management and user administration.	Service activities include: • Administer and manage all MS Exchange Servers, Services and Security • Archive email as per CUSTOMER policy and requirements • Manage support extension with 3rd party that provide hosted services (e.g. Message labs, Symantec etc.) • To include email journal archives, email archives and file archives
	Managed Web Services	Is the business of housing, serving and maintaining files for one or more websites which are made accessible to the Internet. This service provides adequate storage and bandwidth to ensure the website or web application performs as expected.	Service activities include: • ITS shall ensure the supported applications remain within the requirements for maintaining manufacturer support as defined or agreed to by CUSTOMER • ITS shall ensure all supported applications software maintains compliance with all applicable legal, legislative, and tax requirements • ITS shall provide the necessary tools, skills and knowledge to support the continued maintenance and support for the web environments

Appendix A

IT Service Catalogue (6/11)

Service Area	Service	Service Scope	Service Description
Platform Support	**Domain Controller and Active Directory / AD Azure**	The scope of this service includes providing management of CUSTOMER's Active Directory and Azure Active Directory services. Feature highlights of this service include; performing proactive monitoring of the health, performance, capacity, and availability of the environment; install, configure, maintain, operate, and apply security and other technical patches and fixes; and, managing escalations to third-party suppliers on behalf of CUSTOMER.	Service activities include: Provide administration for CUSTOMER's AD and Access Protocol services (including Group Policies) • This includes but is not limited to: - User and group account administration - Endpoint device administration - Networked service administration - GPO management - DNS administration - Active Directory topology and replication management - Active Directory configuration management - Active Directory schema management - Information management - Security administration - Database management - AD reporting
	Laserfiche Business Process Automation	This service includes the review of CUSTOMER business processes to determine potential efficiency gains by leveraging Laserfiche Electronic Document Management systems and the development of workflows, forms and integrations to automate and enhance these processes.	Service activities include: • Business process review • Business process design • Workflow and template development • Internal form development • External form development and website integration • End-user training • Support and maintenance of automated processes

Appendix A

IT Service Catalogue (7/11)

Service Area	Service	Service Scope	Service Description
Infrastructure Management	**Storage Management / Backup and Recovery**	The Storage Management process is used to monitor and maintain the storage environments to provide data placement, access and recovery. Shall provide 7 x 24 storage device support and monitoring.	Service activities include: Manage the storage solution • Monitor storage use systems management tool database space utilization • Provide additional storage as thresholds are met Backup and recovery support • Use of system management tools to Perform daily backup and restore operations including snapshot replication to DR solution • Provide support for backup and recovery • Maintain and implement systems management tools • Maintain CUSTOMER's backup schedule documentation as per CUSTOMER's prevailing policies and procedures
	Server Support – Operations	This includes the full lifecycle of physical and virtual server management as well as day-to-day server management.	Service activities include: • Select, purchase, setup, configure and deploy service infrastructure as required • Build a Virtual Server Image using the current product HyperV Manager and store the image accordingly • Perform routine server infrastructure maintenance and upgrades to comply with asset management policy and procedures • Maintain and support the Physical cluster Hosts for the virtual platforms • Maintain and update build images quarterly (roll out) • Deploy a HyperV Virtual Server Instance • Perform configuration and testing.

Appendix A

IT Service Catalogue (8/11)

Service Area	Service	Service Scope	Service Description
Data Centre Services	**Data Centre Infrastructure Services**	The provision of a data centre (facility power, environmental control systems and core network) for hosting CUSTOMER equipment.	Service activities include: • Monitor, on an ongoing basis, that there are adequate facilities within ITS's DC configured for the Customers' current and planned server and other computing requirements, including: - Rack space, Blade slots in chassis - Suitable power, UPS support - Cabling e.g. network, SAN, etc. - Port availability on core switches and firewalls - Adequate heating, ventilation and air conditioning systems (HVAC) - Physical security
Network Services	**Network Connectivity Services**	This service monitors the performance and availability of critical IT infrastructure and services allowing ITS to proactively respond to service disruptions. The scope includes wired and wireless network equipment at both ITS and CUSTOMER locations. Exclusion for any SCADA network equipment.	Service activities include: Provide the configuration, management and reporting of all CUSTOMER network devices including Local Area Network (LAN), Wide Are a Network (WAN), and Wireless Local Area Network (WLAN) for all sites. • Install, setup, configure and test network devices • Work with WAN Service Provider to resolve service impacting issues • Perform firmware/IOS updates • Network device status monitoring
	Manage Remote Access and VPN Services	A remote access service is any combination of hardware or software to enable users to remotely access internal corporate network or server services in a secure manner. This service allows ITS to enable and support the Municipality in providing its employees remote access to internal IT resources.	Service activities include: • Providing VPN and remote access capabilities for all end-user equipment including but not limited to mobile equipment, laptops, desktops and tablets • Provisioning the accounts, ensuring the security and access management (licenses), and ensuring the appropriate capacity and performance

Appendix A

IT Service Catalogue (9/11)

Service Area	Service	Service Scope	Service Description
Network Services	**Desktop Telephony Service – Teleconferencing (Voice/Video Services)**	Provide management of voice infrastructure, whether located in the data centre, network wiring closets, or CUSTOMER remote sites.	Service activities include: • Provide first point of contact to for desktop telephony hardware support and IMAC coordination with 3rd parties • Coordinating the selection, coordination setup of telephony hardware • Working with 3rd parties to configure telephony software • Monitoring performance of telephony services • Optimizing network traffic to ensure telephony services are operating optimally
Security Services	**Security Monitoring and Operations**	Provide end to end security services of the IT infrastructure, systems and end-user devices. Analyze and report on cyber threats. Develop and test cyber readiness plans.	Service activities include: • Performing near-real-time security monitoring on CUSTOMER's networks, hosts, applications, databases and end-user computing environment • Provide proactive security advice to improve CUSTOMER's security services • Detect and manage security incidents to stop malicious activity and contain the damage and risk • Respond to security threats in real-time or near-real time as part of an Incident Management process • Provide relevant monitoring logs / reporting to 3rd parties for review and assessments • Manage remedial actions • Perform firewall administration to support the environment • Perform proxy server\web filtering operational and admin tasks • Annually conduct a cyber readiness test • Coordinate vulnerability and penetration testing on a regular basis

Appendix A

IT Service Catalogue (10/11)

Service Area	Service	Service Scope	Service Description
Service Integration	**Change and Release Management**	The main function of Change and Release Management is to ensure the integrity of the system is maintained by controlling what is being moved into each environment and making sure each change is adequately tested before being released.	Service activities include: • Maintain a forward schedule of change • Hold change review / approval meetings • Develop plans for major releases • Resolution of release conflicts • Working with third-party suppliers/partners, if applicable
	Configuration and Asset Management	Configuration and Asset Management includes the full asset lifecycle from asset planning, acquisition through to disposition. In addition, this service includes the activities to manage the configuration of assets (including device images and maintaining a CMDB.	Service activities include: • CMDB, relationships with other processes and 3rd parties • Inventory management (including auto discovery) • Warranty management • License management • Asset planning • Asset refresh/acquisition/disposal • Asset standards • Inventory management • Asset reporting
	Capacity Management	Managing the Capacity Planning process to ensure that there are adequate IT services capabilities available and the usage optimization/tuning of IT resources for optimal performance and cost effectiveness.	Service activities include: • Aggregate capacity data across all infrastructure (network, servers, storage) • Define resource capacity thresholds • Performance tuning and optimization • Report on capacity and forecasts

Appendix A

IT Service Catalogue (11/11)

Service Area	Service	Service Scope	Service Description
Service Integration	**Incident and Problem Management**	The main function of Incident Managements is to restore normal service operation as quickly as possible with minimal disruption to the business. Problem Management is the process for identifying and tracking, issues affecting service delivery, recognizing and correcting recurring incidents and addressing procedural issues. the scope of problem management only applies to Severity 1 and 2 events.	Service activities include: • Incident Identification and Process Initiation • Outage Review Process • Analyze and Diagnose the Incident • Execute Bypass and Recovery • Root Cause Analysis • Report on Incidents and Problems
	Disaster Recovery	A Disaster Recovery Plan (DRP) is a documented process or set of procedures to recover and protect critical IT infrastructure in the event of a failure or a disaster. This is not to be confused with a Business Continuity Plan or a Continuity of Operations Plan. This service is required for the effective management of critical IT infrastructure and services.	Develop and document a DRP that meet CUSTOMERS' Business Continuity (BC) requirements. Activities for this service includes: • Plan, coordinate, perform, and document annual testing/exercises to demonstrate the viability of reliability provisions and the viability of BC and DRP • Provide auditable records of all phases of business continuity/disaster recovery plan formulation, testing, and improvement • Implement business continuity and/or disaster recovery plans • Update the DRP as required

Appendix B

Cost Savings – 1. Develop Modernization Plans

	Year 1	Year 2	Year 3	Year 4	Year 5
Status Quo (salaries, wages and benefits)					
General government and administration services	$ 9,886,503	$10,263,142	$10,639,781	$11,016,419	$11,393,058
Recreational services	$ 7,184,661	$ 7,408,877	$ 7,633,092	$ 7,857,307	$ 8,081,523
Total	$17,071,164	$17,672,018	$18,272,873	$18,873,727	$19,474,581
Recommendation (salaries, wages and benefits)					
General government and administration services	$ 9,882,736	$10,251,842	$10,617,182	$10,978,756	$11,336,562
Recreational services	$ 7,182,419	$ 7,402,150	$ 7,619,639	$ 7,834,886	$ 8,047,890
Total	$17,065,155	$17,653,993	$18,236,821	$18,813,641	$19,384,453
Difference	-$ 6,009	-$ 18,026	-$ 36,051	-$ 60,085	-$ 90,128

Savings over a five-year period total an estimated $210,299.

Assumptions include:

- Improved efficiencies from new systems, including recreation management software, financial systems, payment software, and time and attendance solutions, result in a reducing growth of salaries, wages and benefits by the County and lower-tier municipalities for general governance and recreation services spending.
- The rate of reduced growth begins at 1% in Year 1, increasing by one point each year up to 5% in Year 5.
- New systems are implemented across the County, Lucan Biddulph, Southwest Middlesex, Thames Centre, Adelaide Metcalfe, North Middlesex, and Middlesex Centre. Savings are dependent on each municipality implementing the same systems to reach economies of scale and reduce costs.
- The rate of growth for future salaries, wages, and benefits remains at the average for the 2010 to 2020, as determined by Financial Information Returns.

Appendix B

Cost Savings – 2. Build and Execute a Technology Migration Plan

	Year 1	Year 2	Year 3	Year 4	Year 5
Status Quo					
One-time expenses	--	--	--	--	$16,400
Operating expenses	$27,816	$27,816	$27,816	$27,816	$27,816
Total expenses	$27,816	$27,816	$27,816	$27,816	$44,216
Recommendation					
One-time expenses	--	$17,567	$11,414	$25,327	$25,327
Operating expenses	$3,960	$5,400	$6,960	$8,640	$10,440
Total expenses	$3,900	$22,967	$18,374	$33,967	$35,767
Difference	**-$23,856**	**-$4,849**	**-$9,442**	**$6,151**	**-$8,449**

Savings over a five-year period total an estimated $40,450.

Assumptions include:

- Current cost of offsite tape storage is $21,900 per year, with additional costs for tapes, replacement tape drives, and support totalling $5,916 annually.
- New cloud-based off-site backup will cost $10 per terabyte per month, with an initial use of 11 terabyte, growing by 1 terabytes yearly.
- ITS will need to purchase 14 new servers to replace outdated hardware currently on-site across four lower-tier municipalities. One municipality will be replaced each year after the first year.
- The cost to replace a tape drive will be $16,460.
- Savings are dependent on all lower-tier municipalities choosing to migrate their servers to the County.


middlesex
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