Town of Lakeville

IT and Financial Strategy

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EOTSS | Executive Office of Technology Services & Security

Lakeville Strategic Planning

Implementation Priorities and Recommendations

Introduction

The goal of this document is to align the Town of Lakeville's priorities with best practices and the recommendations of the Lakeville Strategic Plan prepared by TLG in 2016. The Office of Municipal and School Technology, through meetings and interviews with Town staff, reviewed the current state of information technology in Lakeville and developed recommendations based on those findings.

It is important to note that this report will not include a review of business processes nor make any business process recommendations as they are out of scope for this engagement. However, it is impossible to overstate the importance of understanding and accounting for business processes when developing strategic plans. Wherever possible, before following any recommendations leadership should first carefully consider the strategic goals and the business processes of the Town.

Priorities

The priorities, as stated by Lakeville leadership, are the following
- Develop a realistic roadmap to simplify implementation of the Lakeville Strategic Plan recommendations.
- Clarify and provide direction for funding schedules, creating manageable and predictable funding projections for Town leadership.
- Address strategic planning, operational and support needs.
- Address short term infrastructure needs.

Current State Observations

Organizational and Staffing
Any organization needs at least three main functions fulfilled to provide acceptable levels of technology services: strategic IT planning, management oversight and technology support. Strategic IT planning aligns the Town's goals and objectives with IT plans. Management oversight serves to verify that all IT operations are being performed properly. Technology support ensures that end-users and equipment are all working as expected.

The Town has no current process for strategic IT planning or management oversight. Lakeville has contracted with outside vendors to provide technology support, which maintains the status quo and is reactionary rather than proactive or strategic. The Town should focus on ways to fulfill the need for strategic planning and management oversight.

Endpoint Infrastructure

According to an inventory provided by town staff, the average age of endpoints (workstations or laptops) in use is 4.5 years, not including Police cruiser MDT's (mobile data terminals). Five departments are equipped with workstations that are older than 5 years; Assessing, Health, Fire, Town Administrator, Town Clerk. Police cruiser MDT's are all 3 years old. All MDT's are currently running Windows 7. It is a typical practice in local government to adopt a five-year lifecycle replacement policy for all workstations. All workstations are currently running Windows 7 which ends extended support in January 2020.

The lack of a clear lifecycle plan contributes to ongoing management issues such as unplanned or emergency expenditures, increased calls for support and poor-performing workstations. Workstations that fail to meet the operational needs of employees leads to loss of productivity and the potential for security incidents and data loss. Consistently high levels of support requests distract IT personnel from strategic work and cause loss of worker productivity. Unplanned or emergency replacement of equipment can negatively impact yearly budgets and disrupt long-term financial plans.

Printing and Document Services

A proper review of Lakeville's document and printing needs is out of scope of this review. However, it should be noted that the Town should consider evaluating their current needs and solutions to find any efficiencies or cost-savings that may exist.

Network Infrastructure

The Town of Lakeville utilizes a wide-area network provided and maintained by Taunton Municipal Lighting Plant (TMLP). Appendix A lists the locations connected via the wide-area network. This network provides connectivity between municipal buildings, access to the internet and connectivity to TMLP's datacenter for remote data storage services.

Lakeville also utilizes a Town-owned internal network. The internal network is used to provide access layer connectivity to all workstations and servers. According to an inventory provided by town staff, all network switches are appropriate for the environments they are used in and have a useful life of at least another 3 years, with a published end-of-support date of April 2022. The only exception noted is the switch in use at the Council On Aging. The manufacturer will cease support for this switch model on January 31, 2021.

According to the inventory provided by town staff, the following devices are also in use on the network:

- 2 Cisco firewalls in use which have an end-of-support date of August 2022
- Cisco datacenter switch which has an end-of-support date of May 2024
- Cisco Wireless Controller which has an end-of-support date of July 2023
- 2 firewalls for web and spam filtering which may be eligible for upgrades through the manufacturer's hardware refresh program

Server Infrastructure

Physical Servers

The physical server infrastructure in use is mainly Cisco rack servers. These servers should be sufficient and appropriate for the Town's needs through 2021. However, it is important to note that Cisco has announced end-of-life and end-of-support dates for this server model. This announcement means that support agreements with Cisco must be kept current and renewed on time to avoid losing the ability to maintain valid support agreements. The following dates should be considered in development of a technology lifecycle plan:

- End of New Service Attachment Date: December 31, 2017 - For equipment and software that is not covered by a service-and-support contract, this is the last date to order a new service-and-support contract or add the equipment and/or software to an existing service-and-support contract.
- Last Date of Support: December 31, 2021 - The last date to receive applicable service and support for the product as entitled by active service contracts or by warranty terms and conditions. **After this date, all support services for the product are unavailable, and the product becomes obsolete.**

Virtual Servers

The Town operates several virtualized servers which run on their physical server infrastructure. There is no clear policy or procedure for managing the virtual server lifecycle. It is likely that many of the virtual servers are underutilized, redundant or no longer necessary.

Storage Array

Town technology staff should review the existing storage array to determine its current performance and utilization levels to forecast its useful life. This storage array serves as the repository for all Town data. The storage array has a published end-of-service-life date of December 2020 and should be replaced before that date.

Backup and Disaster Recovery

The Town currently partners with TMLP for off-site backup services. It is unclear if the backups are full image-based backups and if they have been verified and tested. While it is a best-practice to use off-site backup services, it is also equally important to fully understand the service, its limitations and how it relates to recovery point objectives (amount of data that can be lost per incident) and recovery time objectives (amount of time that normal business can be disrupted waiting for recovery).

Additionally, it is unclear where the backups are being hosted. If the backups are being housed locally or regionally this may present a risk of data loss in the event of a large-scale event such as hurricane or earthquake. One of the main benefits of off-site backup services is the ability to achieve geographic diversity that mitigates this risk.

As noted by Town technology staff, there is a single storage array that houses all data for Town systems. While Lakeville utilizes TMLP for off-site backup this single storage array only provides a single medium or device for local data backups. The "3-2-1 Rule" is a time-honored and trusted standard for establishing an effective backup strategy. The rule means that an organization should keep AT LEAST 3 copies of business data, the data should exist on AT LEAST 2 mediums (devices) locally and AT LEAST 1 copy of the data should be kept off-site.

The single storage array in use breaks the rule by having all the local data backups stored on a single medium. While a second medium is a best practice the Town may choose to continue the use of single storage medium to lower on-going costs. These factors must be considered and fully understood when developing a backup strategy and business continuity plan. The single storage medium may have adverse effects on recovery point objectives (amount of data that can be lost per incident) and recovery time objectives (amount of time that normal business can be disrupted waiting for recovery).

Risks

The main risks exist due to a lack of strategic planning and management oversight. Verifying that data backups are being performed, systems are patched at that other policy and procedures are properly executed are some examples critical management oversight items. As previously noted, Lakeville has no current process for strategic IT planning. Poor IT planning and lack of IT management can lead to unanticipated expenditures, increased cybersecurity risks, negatively affect service delivery or result in data loss.

Additionally, several key portions of the Lakeville technology infrastructure will be not eligible for manufacturer support agreements beginning in January 2020. This poses several potential risks to the availability, usability and security of the operations of the Town.

Recommendations

Organizational and Staffing

The Town should consider establishing an IT Steering Committee, consisting of key internal personnel, to advise on future initiatives based on strategic goals. The main objective of the Steering Committee should be the alignment of business objectives with IT-related goals. A lack of comprehensive IT-specific strategic planning increases the risk that IT initiatives will fail to achieve community expectations and could result in time and budget over-runs. The IT Steering Committee should, at a minimum, meet annually.

The Town should assign a single entity responsibility of IT management and support. The current practice of multiple contractors providing management oversight and support is not advised. This scenario leads to confusion, poor oversight and disconnected management of technology services and support. It is also advisable to include this entity in all strategic and operational planning activities. Having access to technical input in the early stages of strategic and operational planning activities can

help avoid unanticipated design, technical or business process issues. This could be accomplished by hiring staff or partnering with a managed service provider.

It is recommended that the Town adopt the necessary policies, guidelines and standards to provide the framework to properly drive the planning and management of technology. Appendix B includes resources and references for policy documents. Appendix B also includes a partial list of suggested policies the Town may consider adopting. For the sake of clarity, the following definitions may be helpful:

- Policies - documents that outline specific requirements and rules that must be met. These mandatory and enforceable directives are often supported by standards, procedures and other documents that provide more detail on implementation and compliance.
- Guidelines - a collection of system-specific or procedure-specific suggestions for best practices that guide the implementation of policies and standards. Guidelines are advisory in nature and are strongly recommended.
- Standards - collections of system-specific or procedural-specific requirements that must be met.

The Town should consider establishing dedicated costs centers for all technology related expenditures. This will help Town leadership track expenditures associated with technology and provide for greater transparency.

Endpoints Infrastructure

Based on the 5 Year IT Roadmap (see Appendix C) all workstations will need to be replaced or upgraded by January 2020 and are the first infrastructure category due to be replaced. It is recommended that the Town budget for the replacement of all workstations in FY20 and plan to complete the replacement by December 2019. New workstations should be at least functionally equivalent and based on an established standard.

It is recommended that the Town officially adopt policies dictating replacement schedules for all workstations and laptops. A 5-year replacement lifecycle for all workstations is recommended. Between 3-5-year replacement lifecycle for all laptops is recommended. The police cruiser MDT lifecycle should be coordinated with the replacement of cruisers. The Town should establish standards for workstations, laptops and MDT's.

Computers – FY20
Approximate budget impact - $50,000

Computers – FY25
Approximate budget impact - $50,000

Printing and Document Services

As already noted a proper review of Lakeville's document and printing needs is out of scope of this review. Lakeville may choose to leverage Commonwealth of Massachusetts State Contract ITS69 for managed print services solutions. A managed print services contract can be used to optimize and

manage the town's document output; to reduce costs; improve efficiency and productivity; reduce IT support workload; and reduce the environmental impact.

Network Infrastructure
The wide-area network service provided and maintained by TMLP is an appropriate solution for the Town. The service levels and costs offered through TMLP are very competitive as compared to other area providers. It is recommended that the Town regularly evaluate this service offering, at least every 1-2 years. The Town may choose to establish guidelines or standards for this service that detail minimum WAN throughputs, minimum/maximum WAN latency thresholds or throughput to the internet.

Several key portions of the Town's internal network infrastructure will be ineligible for manufacturer support agreements beginning in 2022 through 2024. It is recommended that the Town budget for the replacement of the following:

Switching Infrastructure – FY22
Approximate budget impact - $35,000

Firewalls – FY22
Approximate budget impact - $12,000

Wireless – FY23
Approximate budget impact - $20,000

At this time, it is appropriate for all network equipment replacements to be functionally equivalent. However, this assumption should be reevaluated as part of ongoing technology planning. The Town should establish standards for network infrastructure equipment.

Server Infrastructure
The server infrastructure in use should be appropriate for the Town's needs through 2021. However, it is critical that an active support contract is in effect until the replacement of the servers in 2021. If the Town allows the support contract to lapse it may not be possible to renew the support contract through the manufacturer, Cisco Systems. If the support contract has or does lapse it may be necessary to seek third-party support coverage, replace the servers ahead of schedule or develop a contingency plan in case server equipment suffers a service-affecting failure. It is recommended that the Town verify that an active support agreement is in place with Cisco and that the support is renewed timely.

It is recommended that the Town develop a server rationalization plan for all virtualized in-production servers. A server rationalization plan will help the Town determine the correct number, configuration and sizing for servers required to run town systems. Microsoft maintains best practice documentation for Windows server deployments that can be useful during the development of the server rationalization plan. A server rationalization plan can help ensure an efficient IT server infrastructure, minimizing waste and costs.

The Town should budget for server replacements no later than FY22 with replacement complete by December 2021. After that time the physical server infrastructure will not be eligible for continued manufacturer support.

It is recommended that the Town budget for the replacement of the storage array in FY21 and plan to complete the replacement by December 2020

Storage Array – FY21
Approximate budget impact - $50,000

Servers – FY22
Approximate budget impact - $35,000

Backup and Disaster Recovery

The remote data storage services provided by TMLP is appropriate and generally considered a best practice. It is important to develop and document a backup strategy and policy, work to ensure that the current service complies with the strategy and that the backups are tested.

The Town lacks any business continuity and disaster recovery plans. The Town should work to develop a plan and update the plan at least yearly.

Risks

It is recommended that the Town implement a technology lifecycle plan to maintain current and supported technology infrastructure. The plan will position the Town to provide access to appropriate, secure technology assets while allowing for predictable and planned purchase and implementation.

It is recommended that the Town employ the principle of least privilege for all administrative accounts allowing only privileged accounts (authorized access) for users which are necessary to accomplish assigned tasks in accordance with business functions. Administrative users should use separate accounts for non-privileged access to systems. It is also recommended that the Town employ the principle of separation of administrative or privileged access to avoid risks of malevolent activity without collusion.

It is recommended that the Town develop a business continuity and disaster recovery plan. A BC/DR plan will help ensure that all necessary functions will continue in the event of a natural or man-made disaster. A BC/DR plan will allow for access to information systems, ability to perform necessary business functions and recovery to normal business operations.

It is recommended that the Town work to implement CIS Controls, which are widely accepted as a set of best practices. Complete implementation of CIS Controls may not be realistic or appropriate, but it is recommended that the Town prioritize the following controls:

- 1. Inventory and Control of Hardware Assets
- 2. Inventory and Control of Software Assets

- 4. Controlled Use of Administrative Privileges
- 10. Data Recovery Capabilities
- 17. Implement a Security Awareness and Training Program
- 19. Incident Response and Management

All public safety related systems should comply with CJIS policies.

Conclusion

The Town of Lakeville, through careful and thoughtful budgeting, should be well positioned to implement all phases of the Strategic IT Plan beginning in FY20. By following the recommendations detailed in this report the Town should have the foundational pieces of technology in place to execute on the broader plan prepared by TLG.

Appendix A
WAN Locations Serviced by Taunton Municipal Lighting Plant

Location	Address
Town Offices	346 Bedford St
Library	4 Precinct St
Assessor's Office	239 Main St
Police Department	296 Bedford St
Highway Department	6 Montgomery St
Senior Center	1 Deer Crossing
Park Commissary	28 Precinct St
Park Garage	28 Precinct St

Appendix B
List of Suggested Policies for Municipalities

Acceptable Use Policy – Describes the proper and acceptable usage of municipally-owned technology assets.

Social Media Policy – Describes proper and acceptable usage and setup of social media sites and accounts.

Information Security Policy – Describes a set of rules to minimize risk and protect people, data and systems.

Security Awareness Policy – Requires that all necessary staff and/or contractors are made aware of the impact their actions may have on security and privacy. Often includes guidance for end-user training, frequency of training and end-user testing.

Incident Response Policy – Describes the high-level management requirements for incident handling response.

Systems Access Policy – Describes who can access what applications or data and the circumstances under which that access is permitted.

Remote Access Policy – Defines standards and requirements for connecting remotely to municipal networks.

Third Party Access Policy – Establish the standards and requirements for third party access to municipal information technology systems, third party responsibilities and compliance with all other policies

BYOD (Bring Your Own Device) Policy - Describes the standards and requirements for the use of private devices on municipally-owned networks.

Data Backup Policy – Describes and documents what data will be backed up, how frequently, restoration requirements and procedures, retention requirements and data destruction.

DR/BC (Disaster Recovery and Business Continuity) Policy – Describes how the town will prepare and recover from any type of disaster and continue performing essential functions.

Change Management Policy – Describes how system changes will be made and documented to minimize disruption and ensure that resources are used efficiently.

Asset Management Policy – Describes how assets will be inventoried and managed throughout the lifecycle of the asset.

Appendix B
Policy Resources

City of Chicago, IL
https://www.cityofchicago.org/city/en/depts/doit/supp_info/is-and-it-policies.html

Complete City of Chicago Information Security and Technology Policies.
https://www.cityofchicago.org/content/dam/city/depts/doit/supp_info/IS%20and%20IT%20Polices/CoC_IT_IS_Policy_Set_ver_RC_05.pdf

Michigan Municipal League
http://www.mml.org/resources/sample_docs/policies_evaluations/technology.html

Yale University Library
https://web.library.yale.edu/lit/wts

Appendix C
5 Year Roadmap 2018-2021

Calendar Year	2018		2019				2020				2021			
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Organizational and Staffing		Establish IT Advisory Committee.	Kickoff IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.	
Endpoints Infrastructure	Establish endpoint standards.	Budget for replacement endpoints.	Create an Endpoint Management Plan			Complete endpoint replacement.	**Windows 7 EOS**							
Network Infrastructure														Budget for switch and firewall replacements.
Server Infrastructure		Create a server rationalization plan.	Complete server rationalization.		Complete a storage needs analysis.	Budget for storage array.			Complete storage array replacement. **Storage Array EOS**	Budget for server infrastructure.			Complete server replacement.	**Servers EOS**
Backup and Disaster Recovery		Create a formal backup strategy and policy.	Test and verify backup strategy.		Create a Business Continuity Plan.		Test and verify backup strategy.		Review BCP.		Test and verify backup strategy.		Review BCP.	
Risks				Develop a plan for implementation of CIS Controls.				Review CIS Controls implementation.				Review CIS Controls implementation.		
Fiscal Year	FY19						FY20				FY21			
Fiscal Year Budget Impact	$ -						$ 50,000				$ 50,000			

Appendix C
5 Year Roadmap 2022-2024

Calendar Year	2022				2023				2024			
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Organizational and Staffing	Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.		Semi Annual IT Advisory Committee Meeting.	
Endpoints Infrastructure								Budget for replacement endpoints.				Complete endpoint replacement.
Network Infrastructure		Switches EOS	Complete switch and firewall replacements. Firewalls EOS				Wireless EOS			DC Switch EOS		
Server Infrastructure												
Backup and Disaster Recovery	Test and verify backup strategy.		Review BCP.		Test and verify backup strategy.		Review BCP.		Test and verify backup strategy.		Review BCP.	
Risks		Review CIS Controls implementation.				Review CIS Controls implementation.				Review CIS Controls implementation.		
Fiscal Year	FY22				FY23				FY24			FY25
Fiscal Year Budget Impact	$ 82,000				$ 20,000			$ -				$ 50,000