

Integrated Asset Management Strategy

The Corporation of the Town of Newmarket



December 2016

The Town of Newmarket Integrated Asset Management Strategy

Version:	Version 2.0 Full Report
Date	14 December 2016
Developed for:	The Town of Newmarket
Produced by:	Yaku Consulting Inc. and Cole Engineering



Table of contents

EXECUTIVE SUMMARY INTRODUCTION	5
ASSET MANAGEMENT VISION	5
ASSESSMENT OF ASSET MANAGEMENT PROGRAM	7
2017 PROJECTS	9
IMPLEMENTATION PLAN	10
1 INTRODUCTION	12
2 PROJECT APPROACH	13
3 BEST AND INDUSTRY PRACTICE	14
3.1 BEST PRACTICE FRAMEWORKS	14
3.2 CURRENT INDUSTRY PRACTICE	16
4 ASSET MANAGEMENT CURRENT STATE ASSESSMENT	19
4.1 ASSET MANAGEMENT VISION	19
4.2 BUSINESS DRIVERS	20
4.3 ASSESSMENT RESULTS	21
4.4 RIGHT-OF-WAY SECTOR ASSESSMENT RESULTS	25
4.5 STORMWATER SECTOR RESULTS	27
4.6 WATER AND WASTEWATER SECTOR RESULTS	27
4.7 INFORMATION TECHNOLOGY SECTOR RESULTS	28
4.8 PARKS SECTOR RESULTS	30
4.9 FACILITIES SECTOR RESULTS	31
4.10 FLEET SECTOR RESULTS	33
4.11 CENTRAL YORK FIRES SERVICES SECTOR RESULTS	35
4.12 NEWMARKET PUBLIC LIBRARY SECTOR RESULTS	37
5 NEEDS ASSESSMENT AND GAP ANALYSIS	39
5.1 SUMMARY OF NEEDS AND GAP ANALYSIS	40
5.2 GAP ANALYSIS – IMPROVEMENT PROJECTS	44
6 FRAMEWORK SYNTHESIS	46
7 ASSET MANAGEMENT SOFTWARE	51
8 IMPLEMENTATION PLAN	52
8.1 IMPLEMENTATION PROJECT SCHEDULE	54

8.2 RESOURCE REQUIREMENTS	54
8.3 ASSET MANAGEMENT PROGRAM GOVERNANCE	56
APPENDIX A: MATURITY ASSESSMENT QUESTIONNAIRE	61
APPENDIX B: TOWN RESULTS	65
APPENDIX C: RIGHT-OF-WAY SECTOR ASSESSMENT RESULTS	69
APPENDIX D: WATER AND WASTEWATER SECTOR RESULTS	84
APPENDIX E: INFORMATION TECHNOLOGY SECTOR RESULTS	95
APPENDIX F: PARKS SECTOR RESULTS	106
APPENDIX G: FACILITIES SECTOR RESULTS	118
APPENDIX H: FLEET SECTOR RESULTS	129
APPENDIX I: CENTRAL YORK FIRES SERVICES SECTOR RESULTS	142
APPENDIX J: NEWMARKET PUBLIC LIBRARY SECTOR RESULTS	148
APPENDIX K: ASSET MANAGEMENT GAPS AND NEEDS	153
APPENDIX L: IMPLEMENTATION SCHEDULE	160

Executive Summary

Executive Summary Introduction

The Integrated Asset Management Strategy documents the findings of an independent assessment of the Town of Newmarket's Asset Management practice capability undertaken in August to September 2016. It provides an analysis of the current state of practice and identifies the needs in terms of asset management projects to achieve a higher level of practice. Projects in the implementation plan have been scheduled over a 5-year period outlining the sequence, cost and resources required.

Overall compared against best practice, the Town is at an early state of maturity of asset management practice. Many of the asset lifecycle processes are in place but are not fully developed, documented or applied consistently throughout the asset lifecycle or across the entire asset portfolio. This state of maturity is consistent with many other municipalities in Ontario although like Newmarket many are working to improve their current level of practice.

The implementation plan in this strategy addresses the challenges to improve the state of asset management by considering practices, technology and resources. The Town is well positioned to significantly improve its state of practice by following this implementation plan.

Asset Management Vision

The development of this integrated asset management strategy is part of an initiative adopted under the Council's Strategic Priorities for the 2014-2018 term under the theme of Efficiency / Financial Management.

The asset management vision, collaboratively developed by Town staff, demonstrates alignment with the Town's approach to service delivery.

Town of Newmarket Asset Management Vision

Managing service delivery through asset management

Our vision for asset management is to be innovative and fiscally responsible stewards of our infrastructure assets for the benefit of the community we serve and the people we employ, now and in the future. We will develop and continuously improve how we manage our infrastructure assets throughout their lifecycle to ensure they support our goal of a healthy, happy, thriving, dynamic and extraordinary community in which to live, work and play.

We seek to:

- Reach out and build understanding among residents, business, staff and elected officials about the role infrastructure plays in providing services that make our quality of life even better.
- Recognize and respond to current and emerging trends in regulations, society and environment.
- Maintain a balance between an acceptable level of service and a cost that is sustainable for residents and businesses now and into the future.
- Ensure that funding levels and revenue sources are sufficient to meet current and future infrastructure demands.

We will put best practices in asset management into effect, including an asset management strategy that links disciplines and departments, integrates data and software resources and coordinates decision-making so that we will be able to invest capital resources wisely and make informed choices about how we maintain our assets and deliver our services.

The asset management vision provides the direction for the level of development for the asset management program in the Town. Ultimately to achieve this vision for asset management the Town will have to develop a high level of practice of asset management. Given the Town's vision, a reasonable target level of maturity for asset management within a five-year time frame is a level above the current level of practice (maturity levels are shown in Figure 1: Asset Management Maturity Levels).

Executive Summary

Assessment of Asset Management Program

Assessing Asset Management program maturity against a framework of best practice in asset management is a fundamental method to identify the needs to improve an asset management system (program). The process to assess maturity level is to evaluate current practices in each asset sector against the standard of best practice. Best practices are outlined in ISO 55000

The assessment was conducted through a structured workshop format with each of the Town's departments or groups responsible for the different asset sectors in the Town. A series of questions related to asset management practice was presented for discussion that included examples of the practice level for each of five states of maturity.

The questions are structured around 10 different areas of asset management practice within a framework that includes Strategy and Planning, Performance and Demand, Organization and People, Asset Data and Information, and Data Management.

The results of the assessment including the current state, the end state after completing the Implementation Plan, and of the asset management vision is shown in the figure below.

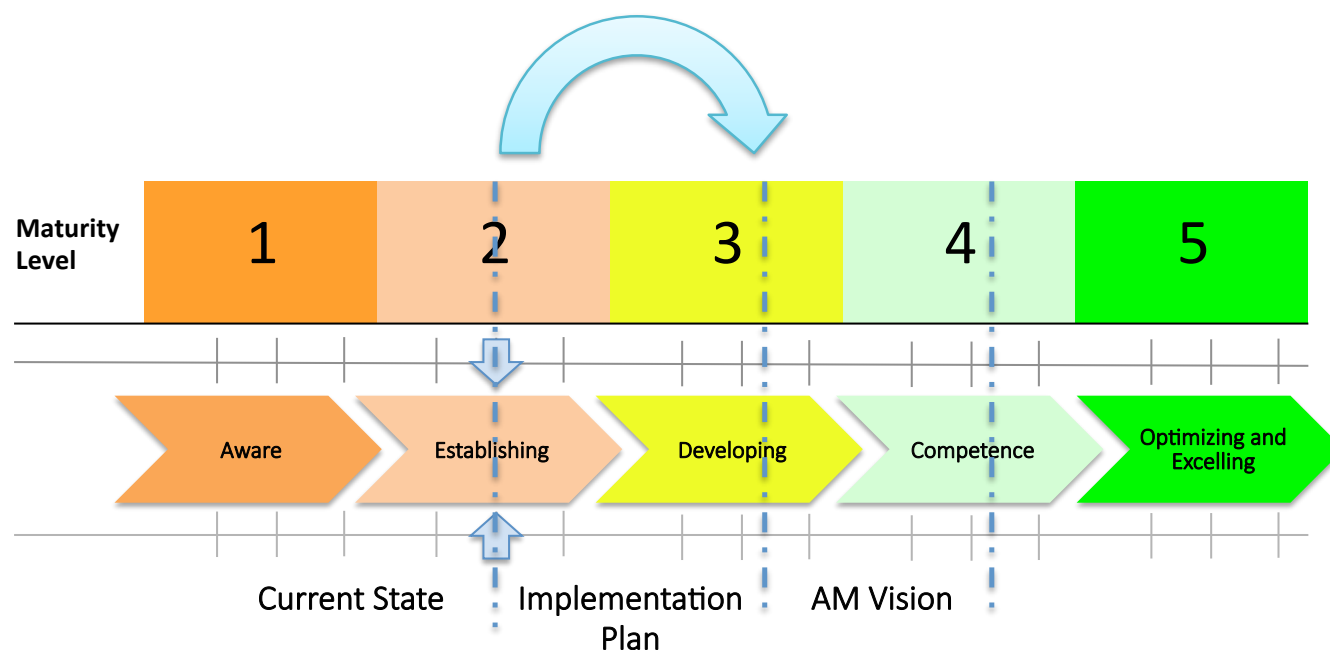


Figure 1: Asset Management Maturity Levels

This independent **Maturity Assessment** of the capability of the Town's asset management system (program) provides insights to understand how the Town may advance its practices and is the basis for the development of the implementation plan.

Executive Summary

A summary of the current state findings is presented in the table below:

Table 1: Summary of current state findings

ID	Assessment Area	Description of Results
100	Strategy and Planning	The Town has recently developed or is completing the major AM documents (policy, strategy, plan) as a result of the Corporate strategy. Although developed, the AM policy has yet to be fully communicated, and the AM Plan has only been developed for major asset classes. Although there are a few gaps, the Town has a solid foundation from which to progress.
200	Performance and Demand	Within its AMP, performance indicators have been identified for the major service assets (e.g. roads, water). There is limited formal customer levels of service, and no link between customer LOS and technical performance indicators (KPIs) or program KPIs. However the Town regularly conducts customer surveys including questions about the services delivered and their cost.
300	Organization and People	Like many Town's and Cities in Ontario, Newmarket has yet to formally identify and develop its asset management team through dedicated or defined roles. The Town has however formed an Asset Management Committee to oversee its AM program and initiatives. This is an important step in program development already accomplished.
400	Life Cycle Practices	Operations and maintenance activities are relatively well formulated although formal cost models linked with the asset strategy (e.g. the trade-off between O&M and capital rehabilitation) are not in place. In addition deterioration curves to understand future performance based on current state or condition have not been developed.
500	Asset Data and Information	The Town uses JD Edwards as its financial system and asset register. While essential, the JDE system lacks data and capability of a comprehensive asset management system to track asset condition and performance. The asset hierarchy, asset identification, and asset attribute systems are not well defined for asset management purposes.
600	Monitoring & Improvement	There is no standard framework for condition measurement (e.g. 1 to 5) across asset classes and frequency of data collection. Depending on asset class, this may not be optimal for asset management purposes. Whereas condition is measured for most assets, an overall performance assessment framework is not in place, e.g. asset capacity, reliability, etc.
700	Risk Management	A risk management framework or a standard method to assess risk applicable for the Town as a whole is not in place. Critical assets have not been formally identified nor asset specific plans to address risks.
800	Decision Making	There is good practice for capital planning and integration in place. What the Town needs to develop is a coordinated process to identify and define optimal alternatives at the project, program and service level.

Executive Summary

ID	Assessment Area	Description of Results
900	Finance	Within the context of available asset and service information, the Town's financial planning (contained in Capital Financing Strategy/Asset Replacement Fund (ARF) Study) appears well developed and comprehensive. As asset information is improved, the Town should easily be able to update and improve their financial planning.
1000	Data Management	For the formal hallmarks of robust data management practice, the Town does not achieve a high level of practice. The Town has not adopted a data management strategy, standards or for the most part identified data stewards. The legislated requirements such as FIR and PSAB are well met, as well as the GIS system in particular for water and wastewater.

2017 Projects

The asset management implementation plan will guide the overall development of the asset management system (program) within the Town. It is comprised of about 30 individual improvement projects organized in five asset management program objectives spread over a 5-year period.

The overall schedule of implementation considers a five-year period and is included in Appendix L: Implementation Schedule. The table below includes the projects recommended for the first year of the Implementation Plan.

WBS	Assessment Area	Assessment Element	Project
1	Governance		
1.1	Strategy and Planning	Asset Management Strategy	120-1 Adoption of the Newmarket Asset Management Strategy (this project)
1.3	Strategy and Planning	Asset Management Plan	140-1 Define and assign responsibility for stormwater assets
1.4	Strategy and Planning	Asset Management Plan	140-2 Develop AMP for missing asset classes
1.2	Organization and People	Asset Management Structure	310-2 Create or designate Asset Manager position to provide guidance and oversee implementation of AM within the Town
1.6	Organization and People	Asset Management Structure	310-1 Develop AM roles and responsibility matrix and incorporate into job descriptions
1.9	Organization and People	Competency	320-1 Identify required AM specific training and develop learning plan for the organization
1.5	Asset Data and Information	Asset Hierarchy	510-1 Develop asset hierarchy from FIR reporting to the maintenance managed item level
1.7	Data Management	Data Owner	1020-1 Establish data roles - owners, users, collectors
1.8	Performance and Demand	LOS	210-1 LOS Model: define LOS and KPIs, and model associated activities and costs.
2	Capital Program Decision Making		
2.1	Decision Making	Capital Plans	820-1 Optimize the current capital plan with updated asset information

Executive Summary

WBS	Assessment Area	Assessment Element	Project
2.2	Monitoring & Improvement	Condition Assessment	620-1 Establish standard condition grading framework and align to asset class/sector condition scales
2.3	Strategy and Planning	Asset Strategy	160-1 Evaluate and document lifecycle practices

Details of these projects are provided in various sections of this strategy.

Implementation Plan

The asset management implementation plan is organized in five asset management program objectives that provide focus to the improvement. The five asset management program objectives are outlined below:

- **Governance:** program oversight and building Town wide asset management frameworks such as risk and levels of service, and building organizational capacity including through skills development
- **Capital Program Decision-Making:** improving the decision-making process for capital spending by developing lifecycle models, incorporating the models into the asset strategy, and linking the planned spending with service levels
- **Data and Information:** improving data and information through development of standards, and integrating technology systems to support the asset management system (program)
- **Maintenance Management:** improving maintenance practices and implementing a new computerized maintenance management system (CMMS)
- **Optimizing Asset Management:** ongoing works to further advance asset management practices and incorporating results of previous improvements into long-range financial plans including rates and reserves

An overview of the plan together with the estimated schedule, new resource requirements and cash flow is provided in the figure below, Figure 2: Overview of Implementation Plan.

The costs indicated are for the asset management strategy projects and do not include the cost of staff time on the projects or the cost of recommended new staff resources. In 2019 the focus and costs include the purchase of a computerized maintenance management system (CMMS). A CMMS is a significant investment, which is why the costs are higher than in other years.

Executive Summary

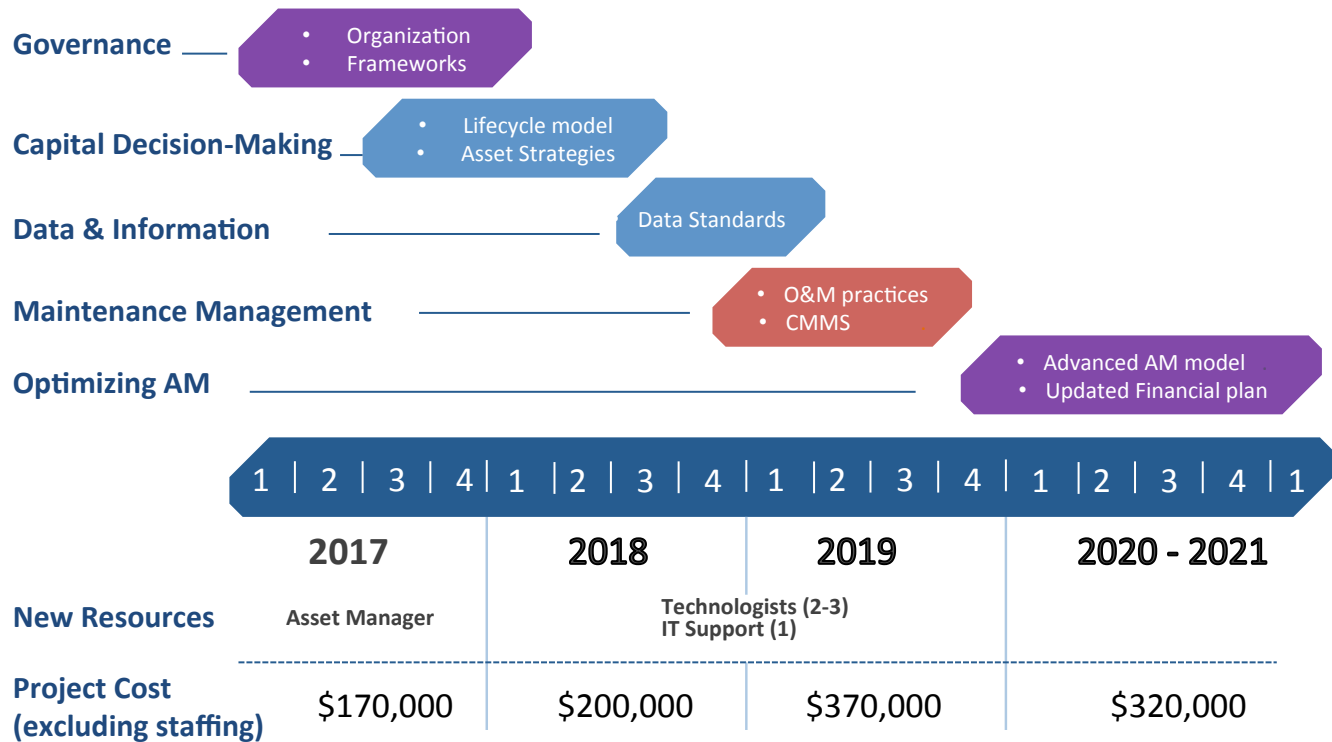


Figure 2: Overview of Implementation Plan

Based on the current level of practice of asset management within the Town and the requirements to continuously deliver at the higher level anticipated in this strategy, additional staff resources would be required. The positions and responsibilities are:

- Asset Manager: oversee and provide direction across the Town to implement asset management practices in a coordinated and integrated fashion.
- Technical staff: technologists or engineers to develop asset specific programs to measure and monitor asset performance, collect, manage and analyze asset data and support the program
- Information Technology staff: support the configuration and ongoing maintenance of asset management software including a computerized maintenance management system (CMMS), advanced (capital) decision-making software, and the integration of various systems to facilitate asset management.

As an alternative to hiring new staff, the Town could consider outsourcing or a combination of outsourcing and hiring of new staff. However there is a limit to how much outsourced vendors can be relied on since ultimately Town staff must be actively involved with managing assets including data in software systems. Town staff must also have a good understanding of the assets and data in order to make informed decisions. And lastly the requirements are ongoing rather than project based so outsourcing will not provide continuity to the town of asset knowledge and be more expensive in the long term.

1 Introduction

Asset management is a management practice for service delivery and of the assets that support the service based on risk mitigation applied to decision-making. It is commonly defined as achieving agreed upon customer service levels, while minimizing life cycle costs at an acceptable level of risk.

The Corporation of the Town of Newmarket is seeking to develop an integrated asset management strategy (the strategy) for the municipality. This report documents the proposed strategy by outlining how the Town can effectively and efficiently manage its assets in accordance with best practices for life-cycle asset management. This report also provides a Town-wide Implementation plan or roadmap for the strategy of improvement initiatives over a 5-year period.

Asset management is an important tool because it helps municipalities maintain and operate infrastructure in the most effective way helping to manage risk while delivering services to the community. An asset management program can be assessed to benchmark the current state of practice using a framework of best practices. After comparing the current state with best practice and the desired end state, a roadmap for improvement can be established. This asset management assessment process was employed to develop the Town’s integrated asset management strategy.

All of the Town’s departments responsible for its various assets participated in the development of this strategy including Central York Fire Services and Newmarket Public Library Services. Staff from departments or groups and assets includes:

Department / Group

Assets

Engineering	Water
Public Works	Wastewater
Finance	Stormwater
Human Resources	Parks
Central York Fire Services	Facilities
Newmarket Public Library Services	Information Technology
Roads (roads, bridges, culverts, sidewalks)	Fleet

The outputs of asset management planning support municipal decision makers in regard to maintaining infrastructure and providing municipal services.

Through the implementation of this strategy the Town will enable assets to be managed in a consistent fashion, allowing for greater stability in financial and capital planning, more informed decision making regarding investment in new or existing assets, and enhanced interdepartmental collaboration on projects that involve asset management.

2 Project Approach

The integrated asset management strategy follows a typical strategic planning process by assessing areas of strength and weakness and finding opportunities or gaps that can be systematically addressed through an implementation plan or roadmap.

The approach to the project is outlined in these major tasks.

1. Phase 1: Determine current state and needs

- I. Best Practice: provide an overview of best practices for asset management
- II. AM Vision: facilitate development of an asset management vision statement, goals and objectives
- III. Current State: identify current asset management practices, procedures, and tools in use and compare against best practice
- IV. Needs Assessment: identify essential and ideal features of a strategic asset management strategy for the Town
- V. Gap Analysis: identify gaps between current Town practices, departmental needs and best practices

2. Phase 2: Develop an implementation plan

- VI. Framework Synthesis: evaluate needs and gaps within constraints such as resourcing and budget and recommend an approach for implementing the proposed Strategy
- VII. Asset Management Software: evaluate asset management technology needs and recommend types of solutions
- VIII. Strategy Roadmap: a prioritized schedule of improvement initiatives with costs and timing

The findings from the project are compiled together in this report; the Corporation of the Town of Newmarket Integrated Asset Management Strategy.

3 Best and Industry Practice

This section outlines the frameworks for measuring asset management best practice and the current state of practice by municipal government.

Best practice frameworks are discussed to provide context to the assessment framework used to assess the Town of Newmarket's asset management practices.

The current level of practice in the industry of municipal services provides context to the level of practice of the Town of Newmarket's asset management system compared with the practice of other municipal organizations.

3.1 Best Practice Frameworks

The best asset management practices and processes are captured in frameworks recognized as being essential and important to the achievement of proficiency in asset management. There are many different frameworks for asset management all having similar themes or elements to benchmark asset management practice.

Following are three of the common and universally applied frameworks:

The **BS ISO 55000 Asset management** series is developed from PAS 55 and provides an overview, concepts and terminology needed to develop a long-term plan for an asset management system (program). It specifies the requirements for the establishment, implementation, maintenance and improvement of an asset management system. ISO 55000 is applicable for any organization and any assets. ISO has been grouped into 7 sections (e.g. planning, leadership, support). Each section has a number of requirements (or elements) that total 27 in all. Examples of the elements of practice are asset management objectives, competence, communication, and information requirements.

PAS55 Asset Management: The Publicly Available Specification (PAS) was first published in 2004 in response to demand from industry for a standard for asset management. It is applicable to any organization where physical assets are a key or a critical factor in achieving its business goals. PAS 55 provides guidance for the implementation of an asset management system that follows cross industry good practice. PAS 55 identifies 7 practice areas (e.g. asset management policy; asset management strategy, objectives, and plans; asset management enablers and controls) that are similar but not the same as in ISO55000. Within the 7 practice areas are 28 key elements (e.g. asset management plan(s), contingency planning, risk management process, life cycle activities) also similar but not the same as ISO55000.

International Infrastructure Management Manual (IIMM): Now in its 5th Edition, this manual has been updated from the 2011 edition because of the ISO 55000 standards. Whereas

the ISO Standards focus on process or ‘what to do’, the IIMM continues to provide its focus on the application or applying of the practice for infrastructure asset management. Originally developed by New Zealand National Asset Management Steering Group (NAMS) and the Institute of Public Works Engineering Australia (IPWEA), this Manual has been further developed with broad inputs from industry and government from across the world including Canada and the United States. IIMM is divided into 17 areas (e.g. forecasting future demand; establishing base asset knowledge; decision-making techniques; information systems and tools), with 86 practices (e.g. valuation approaches; developing long- term financial forecasts; asset management leadership and coordination; identifying system data, and functional requirements).

Although the structure of these industry best practice guides is somewhat different, fundamentally the principles are the same. Thus most benchmarking frameworks for asset management are based on the practices and principles embodied within these documents, typically using the PAS 55 scale of proficiency in asset management. This proficiency scale measures asset management maturity against 5 states of maturity from a ‘beginning’ state to and ‘advanced’ state or a state exceeding the requirements of the standard. This scale is a measure of the extent to which the capabilities of an organization performs against a framework of best practice (e.g. PAS 55) in asset management.

The aim of any maturity assessment is to provide the asset management practitioner with the information and understanding to help them implement or develop an asset management system (program). An organization can choose from among any number of frameworks to complete its own maturity assessment. The choice should consider a number of factors such as the goal (e.g. whether the organization wishes to certify for ISO accreditation), the current level of maturity (e.g. organizations at the beginning stages of asset management will find many of the assessment questions to be redundant), and the time and effort available and appropriate to complete an assessment. With respect to this latter point, assessment questionnaires can be several hundred questions long or as few as 19. Obviously the greater the number of questions the more commitment required from the organization to complete and document the assessment.

For the assessment of the Town of Newmarket asset management practice, the Asset Management Strategy Assessment Tool (amSAT) was utilized. Based on PAS55 and IIMM, amSAT is comprised of 10 practice areas (Strategy and Planning, Performance and Demand, Organization and People, Life Cycle Practices, Asset Data and Information, Monitoring & Improvement, Risk Management, Decision Making, Finance, Data Management) with 34 practice elements within the 10 practice areas (e.g. operations & maintenance; asset hierarchy; information systems; condition assessment; optimized decision-making; information quality). A structured interview process was employed to rank the current level of practice against the amSAT framework consisting of a series of 2-hour workshops with staff from each of the respective service or asset groups in the Town.

The amSAT assessment uses a similar 5-point maturity scale as that of PAS55 as illustrated in the figure below:

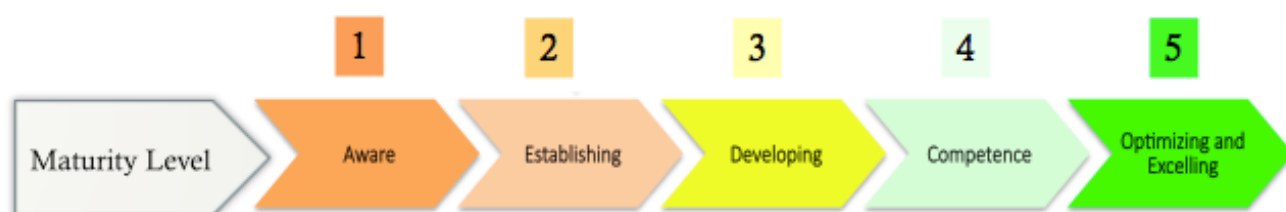


Figure 3: amSAT 5-Point asset management maturity scale

The details of best practice are embodied in the amSAT assessment framework that is described in more detail in Section 4 and Appendix A.

3.2 Current Industry Practice

Whereas the frameworks (ISO 55000, PAS 55, IIMM) provide a best practice benchmark for maturity assessment, this industry practice comparison considers the current state of practice of many different municipal organizations and in particular including those of several other York Region local municipalities.

The information for the summary was obtained directly through an interview process and structured questions.

The summary of current municipal asset management practice is provided against several of the amSAT framework elements.

Strategy and Planning

Almost every municipality has completed asset management plans for the 4 major asset classes (Roads, Bridges, Water, Wastewater). Most of these would be considered basic with basic data and reflect levels of service practice more conceptually than what is actually and consistently done. Almost all municipalities have not completed AMPs for other assets classes.

Many municipalities have not completed a strategy for the improvement of the asset management program or system - noting this is not the same strategy as the asset intervention strategy within an AMP.

Performance and Demand

Most organizations have developed Key Performance Indicators (KPI's) and many in Canada use National Benchmarking. In most cases KPI's have been aligned with a level of service (LOS) theme, and between LOS and high-level goals or aims such as sustainability or strategic planning. However although there is some reported cost linkage – the relationship between LOS and cost - the majority regard this area as a work in progress.

Organization and People

In most municipalities' typical traditional responsibilities for core functions such as maintenance, capital planning, and mapping are in place but are not defined in the context of asset management. Most mid-sized to small municipalities have not identified formal "AM" positions or responsibilities.

Organizations that are actively engaged in asset management have some form of cross –

organization asset management function. This is typically a corporate asset management group that provides some or all of oversight, consistency of practice, guidance, education, or assistance with AM techniques, tools or business planning. In these organizations there is a high degree of support at the senior levels of management and in a few cases at the elected officials (council) level.

Asset Data and Information

Many mid sized to small municipalities do not have a CMMS although they see this as a need. Most of these municipalities' use the customer service/complaint tracking software as an input for work orders.

GIS is a common technology for virtually all municipalities. The York Region all pipes project is a main driver to build or establish data requirements for water and wastewater assets in the local municipalities.

Monitoring & Improvement

Generally the condition/performance assessment processes followed are:

- Road and Bridges: mature process with variation on frequency of measurement (Roads)
- Fleet: mature maintenance practices with condition grading mostly opinion based where a grading is applied
- Wastewater: CCTV commonly done although transforming findings into trends and projects not as advanced as Roads
- Water: age, breaks and opinion are main data sources

- Facilities: conducting formal BCA's is not a common practice, focus is on major components such as roof and HVAC

Risk Management

Almost universally larger municipalities have developed risk frameworks (how to measure risk) at the corporate level. Infrequently mid-sized or smaller municipalities have developed enterprise risk framework. Most municipalities have some level of risk framework for certain specific assets.

Explicitly the risk framework for linear (Roads) models include decision points based on road condition and type, and in some cases criticality. However, typically for other asset classes the risk modelling lags this level of development.

Decision Making

Cross-functional department interface when it does occur happens during the capital plan process. In the smaller organizations the Finance department plays a significant role in AM primarily with a focus on the budget process and regulated financial reporting.

Smaller municipalities appear to have good informal processes to integrate capital needs across asset classes or service sectors although they do not have formal decision-making processes such as asset criticality to help select across the organization.

For organizations practicing at a more advanced level, prioritization techniques reported include the use of business cases to justify projects, linking projects to LOS (typically only at a high level), and overlaying needs of the main asset classes in the right-of-way to integrate and optimize the capital plan.

Most capital plans are updated annually for a 10-year period. Performance data considered is typically based on condition. Development charges (DC) studies were identified as a source for project needs where growth is a driving force. While the plan may cover 10 years most municipalities recognized limitations on accuracy or confidence in projects beyond about 3 years out.

Finance

Financial and capital plans are being prepared to an extent on the basis of condition and risk profiles. Efforts are being made to introduce needs from condition assessment programs to establish the projects with the budget then subsequently being set. Most notably this happens in the Road sector.

In most municipalities budgeting occurs in department silos using trends from previous years – the budget is set and the capital projects determined to meet the budget.

Development of more formal processes appears to be an emerging area for most of the surveyed York Region local municipalities.

Data Management

Municipalities all report collecting data for mapping, capital plans and AMPs. Very few have formally identified data standards or a strategy to manage the data. Asset hierarchies typically were established from PSAB. Both hierarchy and data may be changed or improved when formal CMMS or GIS programs/projects are developed.

4 Asset Management Current State Assessment

4.1 Asset Management Vision

To guide the development of the Town’s asset management program, Town staff collaboratively developed the following vision for asset management:

Newmarket’s Asset Management Vision

Managing service delivery through asset management

Our vision is to be innovative and fiscally responsible stewards of our infrastructure assets for the benefit of the community we serve and the people we employ, now and in the future. We will develop and continuously improve how we manage our infrastructure assets throughout their lifecycle to ensure they support our goal of a healthy, happy, thriving, dynamic and extraordinary community in which to live, work and play.

We seek to:

- Reach out and build understanding among residents, business, staff and elected officials about the role infrastructure plays in providing services that make our quality of life even better.
- Recognize and respond to current and emerging trends in regulations, society and environment.
- Maintain a balance between an acceptable level of service and a cost that is sustainable for residents and businesses now and into the future.
- Ensure that funding levels and revenue sources are sufficient to meet current and future infrastructure demands.

We will put best practices in asset management into effect, including an asset management strategy that links disciplines and departments, integrates data and software resources and coordinates decision-making so that we will be able to invest capital resources wisely and make informed choices about how we maintain our assets and deliver our services.

Background

For the 2014-2018 term of Council, staff worked with Council to create a framework for action guided by the following themes for Strategic Priorities:

- Economic Development / Jobs
- Enhanced Recreational Opportunities
- Community Engagement
- Efficiency / Financial Management
- Traffic Safety & Mitigation

The development of an asset management strategy (plan, policy & program) is an initiative adopted under the theme of Efficiency / Financial Management. Accomplishments to date include:

- Development of an Asset Management Committee comprised of management staff across all service areas and departments within the Town. Generally the committee purpose is to guide and promote the development of asset management practices for the Town.
- Adoption of an Asset Management Policy
- Completion of an Asset Management Plan for major assets – Road, Bridges and Water and Wastewater in 2014
- Completion of an Integrated Asset Management Strategy (this report) outlining a plan for improvement of asset management aligned with the Town’s Asset Management Framework
- Development of an Asset Management Vision as part of the Integrated Asset Management Strategy project.

The asset management vision is a further demonstration of the alignment of the Town’s collaborative approach to service delivery with the strategic corporate direction.

4.2 Business Drivers

There are a number of internal and external factors or drivers that affect the performance of every organization. According to this definition, a **business driver** is a resource, process or condition that is vital for the continued success and growth of a **business**. A company must identify its **business drivers** and attempt to maximize any that are under their control.¹

Identifying the business drivers helps the Town identify priorities in improvement plans. To identify prominent asset management drivers for the Town, a survey was conducted of Town staff. The results from the survey are tabled below.

Table 2: Ranked Asset Management Drivers

Rank	Asset Management Driver
1	Asset Replacement/Renewal or Aging Infrastructure
2	Asset Maintenance
3	Operational Efficiency
4	Sustainability
5	Service Level Improvement - customer expectation
6	Regulation and Compliance

¹ <https://www.techopedia.com/definition/28013/business-driver>

Rank	Asset Management Driver
7	Knowledge of Assets
7	Funding Limitations - Customer Willingness to pay
9	Funding Limitations - Government Subsidies
10	Risk Management - uncertainty of risk exposure
11	Infrastructure Security
11	Staff Skills, Experience and Retention
11	Mandated Long Term Asset Planning
14	Customer and Stakeholder Involvement/ expectations
15	Climate Change
16	Data Management
17	Capital Expenditure Reduction/Reduce Debt
17	Challenges to deliver capital program
19	Continuous Improvement - Internally Driven
20	Contractor/Procurement Process
20	Aging Workforce

Note: The ranking score is the same for items that receive equal votes

Asset replacement and aging infrastructure is a driver that every municipality must deal with, and finding ways to efficiently manage infrastructure will continue to be a constant challenge within Canada. Municipalities are increasingly being expected to manage more with less and need to find ways to more efficiently manage infrastructure. This also ties into sustainability, where municipalities need to be able to maintain their levels of service that have been set even though there are increasing demands for service and competition for taxpayer and other government funding.

The ranking of the drivers is used to help assess priorities when evaluating the needs for the asset management system (program) and setting priorities for the development of the asset management roadmap. This is discussed in further detail in Section 6 Framework Synthesis.

4.3 Assessment Results

The following sub-sections provide a summary of the current state assessment and observations made based on workshops; reviews of existing documents and/or follow up interviews with staff representing the different service or sector groups within the Town.

Services and Assets

Newmarket's departments are allocated amongst four commissions with two service areas partially (Central York Fire Services) or wholly (Newmarket Public Library) owned by the Town.

The four commissions and representative services are the Office of the CAO including Human Resources; Corporate and Strategic Initiatives; Corporate Services Commission including Legal Services, Financial Services and Communications Information Technology; Development and Infrastructure Services Commission including Planning and Building, Engineering and Public Works Services, and Community Services Commission including Recreation & Culture, Economic Development and Customer Services.

In addition, the Town's power supply is managed through Newmarket-Tay Power Distribution Ltd (NTPD). NTPD is 93% owned by Newmarket Hydro Holdings Inc, which is a wholly-owned subsidiary of The Town of Newmarket, and 7 % owned by Tay Holding Company Inc which is wholly-owned by the Township of Tay.

The focus of this Asset Management Strategy is the service areas or sectors directly controlled by Town staff. In addition an abbreviated form of the asset management practice assessment was completed for Central York Fire Services and Newmarket Public Library. In accordance with best practice, contracted service provided is expected to be guided by or to comply with an organization's asset management program. Accordingly an assessment using a limited set of questions was completed for these two service sectors in the context of management of contracted services. NTPD was not assessed in this project.

In municipal asset management the term service usually refers to a service provided to residents and business of the municipality. The term sector is typically used to describe a group of assets with a service area. For example the Transportation sector is typically used to describe the road network, bridges, and may also include rail and other forms of transportation assets. In this report the term sector is used as a convenience to describe services provided by the Town (e.g. Water supply) and associated assets, and to also describe asset groups such as Fleet that are not services in the usual definition.

Observations

Overall, the Town is at the "Establishing" stage of asset management practice. Many of the asset lifecycle processes are in place but are not well developed, documented or are applied consistently throughout the asset lifecycle or across the entire asset portfolio.

A summary of the current state findings is presented in the Table below:

Table 3: Summary of current state findings

ID	Assessment Area	Description of Results
100	Strategy and Planning	The Town has recently developed or is completing the major AM documents (policy, strategy, plan) as a result of the Corporate strategy. Although developed, the AM policy has yet to be fully communicated, and the AM Plan has only been developed for major asset classes. Although there are a few gaps, the Town has a solid foundation from which to progress.
200	Performance and Demand	Within its AMP, performance indicators have been identified for the major service assets (e.g. roads, water). There is limited formal customer levels of service, and no link between customer LOS and technical performance indicators (KPIs) or program KPIs. However the Town regularly conducts customer surveys including questions about the services delivered and their cost.
300	Organization and People	Like many Town's and Cities in Ontario, Newmarket has yet to formally identify and develop its asset management team through dedicated or defined roles. The Town has however formed an Asset Management Committee to oversee its AM program and initiatives. This is an important step in program development already accomplished.
400	Life Cycle Practices	Operations and maintenance activities are relatively well formulated although formal cost models linked with the asset strategy (e.g. the trade-off between O&M and capital rehabilitation) are not in place. In addition deterioration curves to understand future performance based on current state or condition have not been developed.
500	Asset Data and Information	The Town uses JD Edwards as its financial system and asset register. While essential, the JDE system lacks data and capability of a comprehensive asset management system to track asset condition and performance. The asset hierarchy, asset identification, and asset attribute systems are not well defined for asset management purposes.
600	Monitoring & Improvement	There is no standard framework for condition measurement (e.g. 1 to 5) across asset classes and frequency of data collection. Depending on asset class, this may not be optimal for asset management purposes. Whereas condition is measured for most assets, an overall performance assessment framework is not in place, e.g. asset capacity, reliability, etc.
700	Risk Management	A risk management framework or a standard method to assess risk applicable for the Town as a whole is not in place. Critical assets have not been formally identified nor asset specific plans to address risks.
800	Decision Making	There is good practice for capital planning and integration in place. What the Town needs to develop is a coordinated process to identify and define optimal alternatives at the project, program and service level.

ID	Assessment Area	Description of Results
900	Finance	Within the context of available asset and service information, the Town's financial planning (contained in Capital Financing Strategy/Asset Replacement Fund (ARF) Study) appears well developed and comprehensive. As asset information is improved, the Town should easily be able to update and improve their financial planning.
1000	Data Management	For the formal hallmarks of robust data management practice, the Town does not achieve a high level of practice. The Town has not adopted a data management strategy, standards or for the most part identified data stewards. The legislated requirements such as FIR and PSAB are well met, as well as the GIS system in particular for water and wastewater.

Current Practice Scores & Opportunity Gaps

The Town's service sectors were scored for each of the Asset Management Elements by comparing observed current practice against best practice. Using the PAS 55 scale of proficiency in asset management scoring system described in Section 2, it was found that the Town demonstrated a level of asset management development in the range between Level 2 and Level 3 as illustrated in the figure below.

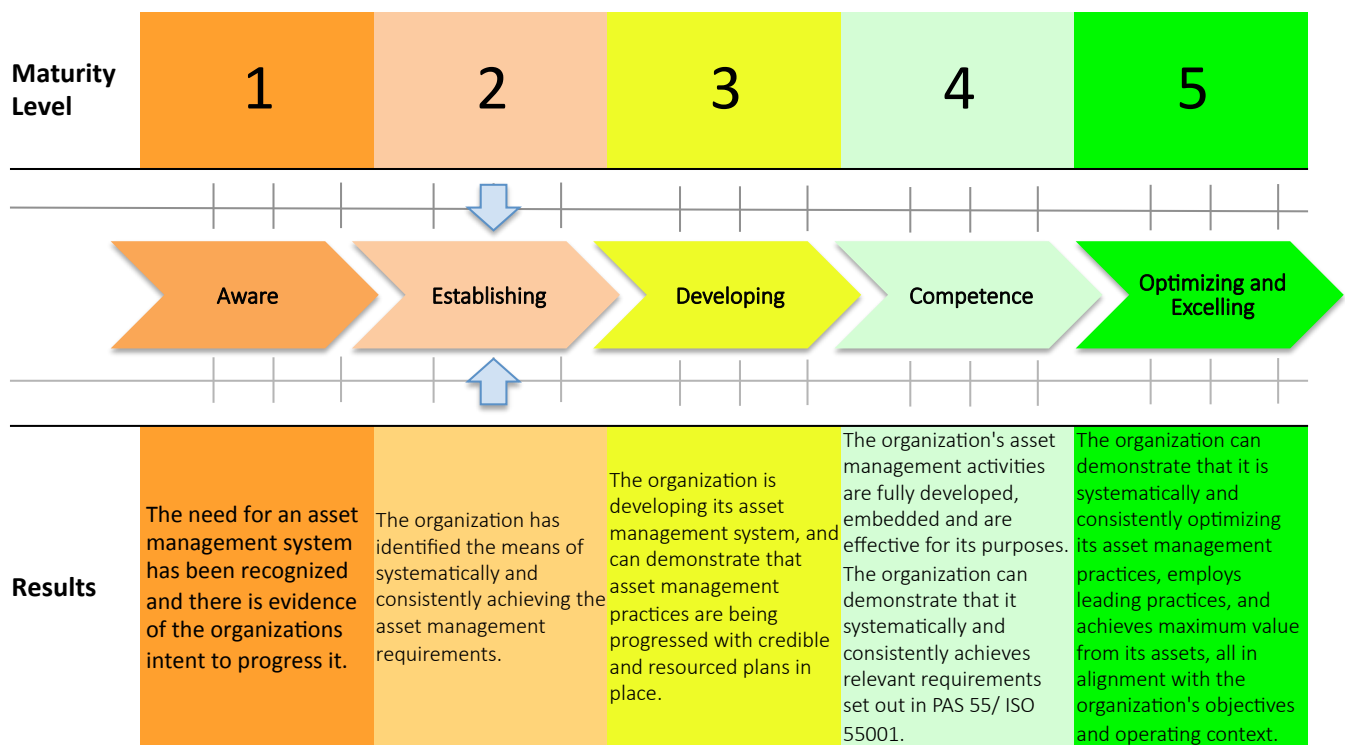


Figure 4: Town of Newmarket Asset Management Maturity Level

The results of each asset management practice area are presented in Table 4: Maturity Level of Assessment Areas - Town Results.

Table 4: Maturity Level of Assessment Areas - Town Results

ID	Assessment Area	Score	Status
100	Strategy and Planning	41	Establishing
200	Performance and Demand	41	Establishing
300	Organization and People	44	Establishing
400	Life Cycle Practices	54	Establishing
500	Asset Data and Information	39	Aware
600	Monitoring & Improvement	52	Establishing
700	Risk Management	35	Aware
800	Decision Making	55	Establishing
900	Finance	53	Establishing
1000	Data Management	38	Aware
	Average Score	45	Establishing

A number of opportunity gaps were identified that can be closed over short and long terms. The detailed results of the current situation and assessment are presented in Appendix B: Town Results.

4.4 Right-of-way Sector Assessment Results

The Right-of-Way sector refers to the Town Roads network that is comprised of approximately 245 centerline road kilometres and associated sidewalks, boulevards, signs and street lighting, as well as culverts and bridges. The roads in the network are predominantly high-class bituminous (HCB) surface with some low-class bituminous (LCB), gravel, asphalt, concrete and other materials. As a lower tier municipality within York Region, the Town has only a few traffic signal locations. Atypically stormwater assets are not included in the Right-of-Way sector.

More information on the assessment results and assets can be found in Appendix C: Right-of-Way Sector Assessment Results.

Observations

Generally the Town is managing the Right-of-Way (Roads network) assets within a similar framework and level of practice of most Ontario municipalities.

For the Right-of-Way sector, key assets and documents have been developed including a secondary plan that may include the new road network needs for the next 20 years, an asset management plan for the major assets (roads, bridges, and culverts), and a Roads Needs Study for a 10-year period for the major assets. Level of service, key performance indicators (KPIs), asset strategies, expected useful life, and

asset risks (only for roads) are discussed in the Asset Management Plan, but they are not linked to performance and cost.

A formal asset hierarchy to assist with risk assessment and risk management framework has not been developed. Basic data for roads, parking lots, and streetlights are stored in the GIS system. JD Edwards software is used for tracking capital and maintenance costs.

Although the Town does not have a formal condition assessment policy or documented standard, roads are assessed through consultant assignments using consultant-based software (Roads Needs Study) and Bridge condition is assessed according to legislated requirements. However no formal assessment and inventory process is in place for signs and streetlights. A formal optimized decision-making process for the Right-of-Way sector is not in place. Decisions are made based on condition assessment and staff knowledge. Capital budgets have been established based on past practice and capital projects are identified in conjunction with established budgets.

Current Practice Scores & Opportunity Gaps

The Right-of-way sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 5: Maturity Level of Assessment Areas - Right-of-Way below defines the overall AM Maturity Levels for the assessment areas.

Table 5: Maturity Level of Assessment Areas - Right-of-Way

ID	Assessment Area	Score	Status
100	Strategy and Planning	48	Establishing
200	Performance and Demand	50	Establishing
300	Organization and People	33	Aware
400	Life Cycle Practices	53	Establishing
500	Asset Data and Information	35	Aware
600	Monitoring & Improvement	67	Developing
700	Risk Management	40	Establishing
800	Decision Making	60	Developing
900	Finance	53	Establishing
1000	Data Management	30	Aware
	Average Score	47	Establishing

4.5 Stormwater Sector Results

The Town has 53 stormwater management ponds, 55 kilometers of waterways and 253 kilometers of storm sewers. Responsibility for the stormwater system is shared between two groups, Public Works Services (Water and Wastewater), and Engineering Services. The storm sewers are maintained by Water and Wastewater. The stormwater ponds are planned by engineering and maintained by Water and Wastewater. Responsibility for the long term planning and replacement/rehabilitation of Stormwater assets has not been assigned and therefore is currently not being conducted. The Town is preparing to introduce a By-Law to establish a reserve fund for management of assets in this sector. This is an important step in an asset management program.

As there is limited information for this asset sector, the maturity assessment has not been completed.

4.6 Water and Wastewater Sector Results

The assets managed by Public Works Services Water and Wastewater division includes water pipes, sewerage, storm sewers, stormwater ponds. The water system comprises 287 km of watermains, with 2,761 valves. The wastewater system comprises 253 km of sewers and 4,066 manhole covers. As noted in Section 4.5 Stormwater Sector Results, responsibility for stormwater assets is shared with Engineering Services.

Contracted services include hydrant inspections, CCTV services and hydraulic modeling. Engineering Services is responsible for system performance analysis. There is no computerized maintenance management system (CMMS).

More information on the assessment results and assets can be found in Appendix D: Water and Wastewater Sector Results.

Observations

The Water and Wastewater division currently lacks formal and systematic control of many processes and procedures. There is no master plan for service. A management plan, Drinking Water Quality Management System (DWQMS), is applied to water assets only. The department's asset management practices are not well documented. On an informal basis the division manager currently carries out the role of Asset Manager for Water and Wastewater assets.

Staff knowledge is used for replacement and repair decisions. There are no deterioration curves developed and no computerized or formal work management system. Data management hierarchies are captured in GIS but no formal documentation of hierarchies is in place. The department has no formal condition assessment program in place but does use CCTV for the wastewater system. Documentation of water and wastewater pipe breaks is currently being gathered so that it can be used in the future for condition assessment and capital planning purposes.

Current Practice Scores & Opportunity Gaps

The Water and Wastewater Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 6: Maturity Level of Assessment Areas – Water and Wastewater below defines the overall AM Maturity Levels for the assessment areas.

Table 6: Maturity Level of Assessment Areas – Water and Wastewater

ID	Assessment Area	Score	Status
100	Strategy and Planning	47	Establishing
200	Performance and Demand	50	Establishing
300	Organization and People	40	Establishing
400	Life Cycle Practices	33	Aware
500	Asset Data and Information	45	Establishing
600	Monitoring & Improvement	47	Establishing
700	Risk Management	50	Establishing
800	Decision Making	55	Establishing
900	Finance	60	Developing
1000	Data Management	30	Aware
	Average Score	46	Establishing

4.7 Information Technology Sector Results

The Information Technology (ITD) Department is responsible for managing laptops, desktops, cell phones, mobile devices, printers, copiers, the GIS database, corporate IT assets (servers, network equipment, WiFi) and air conditioning units that protect the IT assets. ITD is owner of the software and stewards of the data. ITD maintains contract services for AC units, but York Region owns and maintains the fibre communication networks.

More information on the assessment results and assets can be found in Appendix E: Information Technology Sector Results.

Observations

The IT Department has a growing awareness of the connection between master plans and AM plans but development of the connection is in the early stages. There is no documentation of a strategy or plan for management and development of sector assets. The Department’s management approach is more

reactionary, with the exception of the phone system. Asset lifecycle is documented but there is no senior staff ownership. Replacements are tracked on a spreadsheet. Finance gets information for reporting for itself through purchase orders etc.

Service performance is measured, and roles and responsibilities are clearly defined for staff responsibilities. However, there is asset management roles are informally defined.

Costs are tracked through the budget and the lifecycle (useful life) of the assets are known. For example, computers have an expected useful life of four years. Asset IT software is not integrated; therefore, there are data silos and information is collected mainly in spreadsheets. Asset IDs are not used universally across the various systems. There are data owners but control and use of data by them is still under development. Awareness for information quality is present, but it needs to be developed further. Failure investigation is a highly developed process. However there is no formal process in place for risk management. The Department has a one-year plan and a five-year plan for asset renewal and rehabilitation.

Current Practice Scores & Opportunity Gaps

The Information Technology Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 7: Maturity Level of Assessment Areas - IT below defines the overall AM Maturity Levels for the assessment areas.

Table 7: Maturity Level of Assessment Areas - IT

ID	Assessment Area	Score	Status
100	Strategy and Planning	47	Establishing
200	Performance and Demand	60	Developing
300	Organization and People	47	Establishing
400	Life Cycle Practices	47	Establishing
500	Asset Data and Information	50	Establishing
600	Monitoring & Improvement	80	Competence
700	Risk Management	40	Establishing
800	Decision Making	50	Establishing
900	Finance	N/A	N/A
1000	Data Management	50	Establishing
	Average Score	52	Establishing

4.8 Parks Sector Results

The Public Works Service Parks division is responsible for managing parkland including soccer fields, baseball diamonds, cricket fields, playgrounds, and trails. Other sector assets are parkland equipment (e.g. bleachers), street trees (30,000), boulevards on the Right-of-Way, and woodlands. There are over 45 active parks and open spaces, over 800 acres of parkland and 44 kilometres of walking and biking trails. The Facilities division is in charge of buildings within the Parks sector. Fleet is responsible for the maintenance of vehicles used by Parks. Lighting on trails is the responsibility of Newmarket Hydro.

More information on the assessment results and assets can be found in Appendix F: Parks Sector Results.

Observations

The Parks division does not have a formal asset management plan or master plan in place. However the division does have a guidance document, the Recreation Play Book, that outlines improvement opportunities and plans. The Recreation and Culture Department dictates/leads development, and Engineering Services manages design and construction. There is a lack of risk and cost assessment of technical performance, though technical performance is measured and reported. Asset management staff roles are non-existent.

For the life cycle assessment, although useful lives have been determined, no deterioration curves and hierarchies have been created for the assets. For asset data and information, no work has been done on this and no records exist. No formal processes are in place for decision-making, and decisions are made based on staff discussions and inspections. Only the playgrounds currently have replacement plans.

Current Practice Scores & Opportunity Gaps

The Parks sector attained an overall maturity level of “Aware” in terms of its asset management processes, procedures, and practices.

Table 8: **Maturity Level of Assessment Areas – Parks** below defines the overall AM Maturity Levels for the assessment areas.

Table 8: Maturity Level of Assessment Areas – Parks

ID	Assessment Area	Score	Status
100	Strategy and Planning	20	Aware
200	Performance and Demand	30	Aware
300	Organization and People	33	Aware
400	Life Cycle Practices	53	Establishing
500	Asset Data and Information	25	Aware
600	Monitoring & Improvement	60	Developing
700	Risk Management	20	Aware
800	Decision Making	40	Establishing
900	Finance	N/A	N/A
1000	Data Management	20	Aware
	Average Score	34	Aware

4.9 Facilities Sector Results

The Town of Newmarket owns and operates a number of facilities and buildings. Many of the Newmarket facilities are also available for rent. List of Town’s buildings, facilities, and outdoor amenities are presented as follows:

- Art Ferguson Clubhouse
- Central York Fire Services Station 4-1
- Central York Fire Services Station 4-2
- Elman W. Campbell Museum
- Global Pet Food Dog Park presented by snapd
- Gorman Outdoor Pool
- Hollingsworth Arena
- Magna Centre
- Municipal Offices
- Newmarket Community Centre & Lions Hall
- Newmarket Operations Centre
- Newmarket Public Library
- Newmarket Theatre
- Old Town Hall
- Ray Twinney Recreation Complex
- Recreation Youth Centre & Sk8Park
- Riverwalk Commons
- Rogers Spray Pad
- Seniors' Meeting Place

More information on the assessment results and assets can be found in Appendix G: Facilities Sector Results.

Observations

Asset management plans and strategies are not formally documented; however, some aspects are in place. Planning is mostly based on staff opinion and knowledge, as there is no documented process in place.

Customer expectations are known based on expert opinions and customer feedback. Regulatory requirement (e.g. Accessibility, AODA, TSSA, etc.) are determined and documented. Future demand is estimated based on staff experience, but not fully documented.

Asset hierarchies are prepared at a high level (facility level) and not provided for lower levels (e.g. component group, component). An asset inventory was developed for the asset hierarchy about 10 years ago but has not been updated or maintained. The inventory included the relationship between equipment and the system or process to which it belongs (the asset hierarchy). Asset data is stored in excel spreadsheets but the data is fragmented and incomplete. Data is managed by the facility supervisor however there is no data standard or data quality assessment process.

Building condition assessments have been completed for priority facilities although there isn't a formal process in place to complete the assessments. There is no formal risk assessment process to help manage the priority needs in the capital plan. Where available the capital plan is established based on condition assessment results, expected useful life, and feedback from vendors. Asset renewal and replacement decisions are made mostly based on asset age and budget availability.

Current Practice Scores & Opportunity Gaps

The Facilities sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 9: Maturity Level of Assessment Areas – Facilities Sector below defines the overall AM Maturity Levels for the assessment areas.

Table 9: Maturity Level of Assessment Areas – Facilities Sector

ID	Assessment Area	Score	Status
100	Strategy and Planning	27	Aware
200	Performance and Demand	40	Establishing
300	Organization and People	53	Establishing
400	Life Cycle Practices	67	Developing
500	Asset Data and Information	35	Aware
600	Monitoring & Improvement	53	Establishing
700	Risk Management	30	Aware
800	Decision Making	60	Developing
900	Finance	40	Establishing
1000	Data Management	50	Establishing
	Average Score	46	Establishing

4.10 Fleet Sector Results

Fleet is responsible for the maintenance and repair of all of the Town’s vehicles. Fleet owns and utilizes equipment and spare parts for the maintenance and repair of the following vehicles:

- Fire Trucks (Aerial, Pumper, Tanker, Rescue Truck)
- Passenger Vehicles
- Vans
- Cube Vans
- Light Duty Trucks
- Heavy Duty Trucks
- Trailers

More information on the assessment results and assets can be found in Appendix H: Fleet Sector Results.

Observations

Asset management plans and strategies are not formally documented. Planning is mostly based on staff opinion and knowledge, as there is no documented process in place.

Customer levels of service have been identified but not documented formally and not measured. The Commercial Vehicle Operators Safety Manual is considered in developing maintenance programs. There is no demand forecasting process and needs are mainly identified through discussions between Fleet staff and division managers.

For most assets, an asset hierarchy is provided at a high level and no further break down is available. Physical data (e.g. mileage, hours of operation, VIN numbers) were previously stored in JD Edwards; however, this is not maintained anymore. JD Edwards is used for maintenance work orders however the system is not user friendly. Quality checks are in place on a monthly schedule for updating data and determining missing data. The Town has initiated a pilot project with Infomax (a software solution) to upload “written” work orders directly to JD Edwards via Bluetooth using special paper and pen. Staff reportedly is pleased with the ease of use and the accuracy of the results.

A condition assessment process is in place for vehicles using visual inspection, maintenance history and staff opinion. Condition is recorded and stored in JD Edwards for each vehicle. Results are forwarded to division managers through appropriate forms to allow them to plan for future needs. A capital plan is in place for fleet assets e.g. hoists, tools and equipment.

Current Practice Scores & Opportunity Gaps

The Fleet Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices. It should be noted that not all questions were asked of Fleet as many overlapped common areas asked in separate sections of other Town staff, for example questions on asset management strategy and policy, finance and risk.

Table 10: Maturity Level of Assessment Areas – Fleet Sector below defines the overall AM Maturity Levels for the assessment areas.

Table 10: Maturity Level of Assessment Areas – Fleet Sector

ID	Assessment Area	Score	Status
100	Strategy and Planning	60	Developing
200	Performance and Demand	40	Establishing
300	Organization and People	60	Developing
400	Life Cycle Practices	73	Developing
500	Asset Data and Information	45	Establishing
600	Monitoring & Improvement	40	Establishing
700	Risk Management	NA	---
800	Decision Making	80	Competence
900	Finance	NA	---
1000	Data Management	33	Aware
	Average Score	54	Establishing

4.11 Central York Fires Services Sector Results

The Town of Aurora and the Town of Newmarket jointly own Central York Fire Services (CYFS). Through agreement, in the event of a large fire and/or simultaneous fires in different parts of Newmarket and/or Aurora, CYFS would rely on neighbouring municipalities to assist them. This cross-municipality assistance is reciprocated by CYFS to its neighbouring municipalities.

Central York Fire Services Sector has four fire stations (two in Newmarket), a training centre, vehicles (fire trucks and light vehicles), and equipment (e.g. personal protective equipment and firefighting equipment).

Each municipality is financially responsible for the fire stations within their municipality, and Fleet maintenance is provided primarily through the Town of Newmarket with cost shared with Aurora through an allocation formula.

The Town manages maintenance of the two fire stations in Newmarket.

More information on the assessment results and assets can be found in Appendix I: Central York Fires Services Sector Results.

Observations

Although Fire Services does not have formal asset management documents, the 2014 Master Plan Update includes some aspects of asset management strategies and plans. A performance indicator, Response Time, measures the level of service for Fire services. Response time is determined (6 minutes for initial response) and measured but the target has not consistently been achieved. Partially in response to this, a fifth fire station is planned in the near future.

Cost is considered and analyzed in determining the level of service. Risk levels are determined and the number of required equipment and staff is clearly defined. Fire Services is aware of required data, but they have a shortage of resources to document and collect it.

There is no formal condition assessment process in place for the Fleet although there is usually discussion on major needs and overall vehicle condition with the Town’s Fleet services group. Replacement is generally scheduled based on age and not condition. Replacement costs and times are presented in reports to Joint Council Committee (JCC).

Current Practice Scores & Opportunity Gaps

The Central York Fires Services sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

This service area is not fully under the control of the Town; therefore a limited set of questions was used in the assessment of the service area to establish the basic level of asset management maturity.

Table 11: Maturity Level of Assessment Elements - Central York Fire Services below defines the overall AM Maturity Levels for the assessment elements.

Table 11: Maturity Level of Assessment Elements - Central York Fire Services

ID	Assessment Element	Score	Status
110	Asset Management Policy	20	Aware
120	Asset Management Strategy	20	Aware
130	Master Plan	60	Developing
140	Asset Management Plan	40	Establishing
210	LOS	80	Competence
420	Operations & Maintenance (O&M)	80	Competence
520	Asset Management Data	40	Establishing
620	Condition Assessment	40	Establishing
920	Reserve Fund	60	Developing

4.12 Newmarket Public Library Sector Results

The Newmarket Public Library Sector assets include the library building, books, CDs, furniture, end user assets (e.g. computers, laptops, scanners, printers), and network assets (e.g. servers, routers).

More information on the assessment results and assets can be found in Appendix J: Newmarket Public Library Sector Results.

Observations

Asset management plans and strategies are not formally documented, however, many requirements of an asset management program are in place because the Town must demonstrate some of these aspects are in place.

Level of use of material (books, software etc.) is carefully monitored and tracked (e.g. registered members, borrowings, etc.). Also online surveys are in place to determine customer needs. Two levels of service indicators are used; area of library space/capita and volume/capita. A simple machine to select happy-not happy at the Library door is used to determine customer satisfaction levels.

Asset hierarchies are provided at a high level but not clearly defined in lower levels.

A Building Condition Audit (BCA) for the library building has been completed. Physical condition assessment for books, customer reports for CDs and vendor inspection for equipment (e.g. HVAC) are in place; however, they are not formally documented and in many cases the assessments are subjective. An asset replacement plan is in place. It is based on condition assessment results and expected useful life. Also, technology changes are considered in the asset replacement plan. Projects for answering demand changes are not identified.

Current Practice Scores & Opportunity Gaps

The Newmarket Public Library Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 12: Maturity Level of Assessment Elements – Public Library below defines the overall AM Maturity Levels for the assessment elements.

Table 12: Maturity Level of Assessment Elements – Public Library

ID	Assessment Element	Score	Status
130	Master Plan	20	Aware
140	Asset Management Plan	20	Aware
210	LOS	40	Establishing
510	Asset Hierarchy	20	Aware
620	Condition Assessment	60	Developing
820	Capital Plans	80	Competence
920	Reserve Fund	60	Developing

This service area is not fully under the control of the Town; therefore a limited set of questions was used in the assessment of the service area to establish the basic level of asset management maturity.

5 Needs Assessment and Gap Analysis

The starting point to develop and implement an asset management system (program) is to review and compare the organization’s current management of its assets against the available good management practices and the organization’s vision or goals for where it wants to be. From this comparison it is possible to determine how these requirements are currently met, and what are the gaps and needs for improvement. Based on the findings of needs, a prioritized plan of improvement can be developed.

The current state described in the previous section outlines where the Town is currently using a framework based on the PAS55 asset management best practices. Where the Town would like its asset management practice to be was determined as part of an asset management vision workshop.

During the asset management vision workshop participants were asked to rate where they felt the practice of asset management should strive to be. The exercise was beneficial to identify a target state in terms of the philosophy of asset management in the Town as well with respect to the maturity state assessment scale. Participants overwhelmingly felt that asset management should be adopted as a philosophy of managing the business of service delivery with an advanced state of practice (Level 4).

The needs assessment identifies the specific requirements within the asset management areas of practice that require improvement towards that goal. Given the current state of practice of “Establishing” (Level 2) an intermediate target of “Developing” (Level 3) is aggressive but achievable within the next 5-year period.

This is illustrated in the figure below:

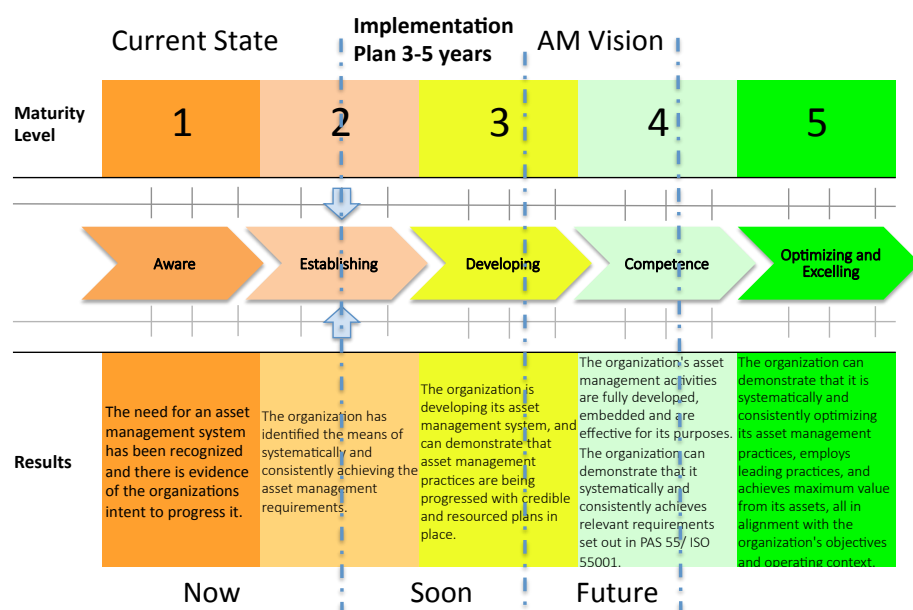


Figure 5: Asset management program target state

5.1 Summary of Needs and Gap Analysis

A needs and gap analysis was completed for the Town as a whole and for each service or sector based on the current state assessment compared with best practice and the target end state. The target end state was determined through the Town of Newmarket Asset Management Vision. In general the findings for the Town apply to each service or sector with the main difference being the extent of the need or gap. For example within the practice area of Strategy and Planning, asset management plans (AMPs) are recommended as part of the need to comprehensively and systematically manage assets. This is applicable for all assets although the gap in each sector is dependent on the extent of the plan that may already have been developed. For example, Right-of-Way Sector has an AMP with some assets missing, whereas Fleet has not developed an AMP at all.

A table of detailed needs is presented in Appendix K: Asset Management Gaps and Needs

The following summary presents the findings of the needs and gap analysis within each of the 10 asset management practice areas. Projects are assigned a code corresponding to the amSAT element (e.g. 130 Master Plan, 140 Asset Management Plan), numbered for each project in that element (e.g. 140-1, 140-2). The project name is followed by a priority ranking with respect to its overall importance to the Town based on a number of factors such as alignment with business drivers and objectives.

Strategy and Planning

Managing assets strategically involves all staff working towards the same goals. Communication of the asset management system (program) is an important part of managing assets strategically. Asset management plans embody the logic and means by which assets are managed including service levels, interventions, current performance and costs. Developing asset management plans is a useful method to capture how things are done. When they are prepared with the input of staff, it is also a useful way to communicate both how things are, and what objectives there are for the Town.

Key actions with overall priority rank are:

- 140-1 Define and assign responsibility for stormwater assets - 1
- 140-2 Develop AMP for missing asset classes - 2

Performance and Demand

There needs to be a link between asset activities and asset performance all the way to how customers experience the service delivered by the assets. This provides the means to understand actions, their costs, and the level of service delivered. The customer best describes customer experience. This is however a longer term prospect since the relationship between customer service and asset performance is complex and not directly or easily measured.

The start of development of the formal customer driven service levels is to actively identify and document activities, standards, and practices in the Town that reflect service levels. This includes activities such as conducting swabbing at night, and clearing driveway entrances of snow for elderly residents, as well as more technical activities such as resurfacing a road based on condition grade, and the frequency of landscaping of parks. Once there is a good understanding of the current service level and costs, customer input will be more meaningful since the service can be explained in terms that they can appreciate.

Key actions with overall priority rank are:

- 210-1 LOS Model: define LOS and KPIs, and model associated activities and costs associated with it - 14

Organization and People

Once senior management and Council approve the Integrated Asset Management Strategy, it must be supported beyond simple acceptance of the IAMS report. Since asset management is seen as a central component of efficient and responsible delivery of services, the Town needs to structure itself to implement an asset management program. Furthermore the Town's Asset Management Vision (AM Vision) can only be achieved with change to the organizational structure and staffing resources. To provide focus and consistency in the application of asset management principles, and ensure that AM Vision is achieved, a central asset management position is required. Support should also be provided directly by assigning specific asset management responsibilities within each department, and by identifying the necessary and specific asset management skills required, and providing the necessary training for staff.

Key actions with overall priority rank are:

- 310-1 Develop AM roles and responsibility matrix and incorporate into job descriptions - 1
- 310-2 Create or designate Asset Manager position to provide guidance and oversee implementation of AM within the Town - 1

Life Cycle Practices

Decision support will be improved through better modeling techniques that will integrate information by considering the whole system. Models that relate lifecycle activities (e.g. operations, maintenance, renewal) and costs with asset performance are needed. Lifecycle activities are practices across the life cycle of assets (e.g. creation, operation, maintenance, rehabilitation/replacement, disposal and performance monitoring). Through these practices the desired performance of assets can be achieved. Each practice has a corresponding cost and an outcome related to asset performance e.g. improved or maintained condition. At a higher level of asset management maturity, Operations and Maintenance (O&M) activities and costs should be integrated with other life cycle actions and strategies. When costs

of the life cycle activities are also understood, optimal decisions (or asset strategy) and trade-offs can be supported.

Key actions with overall priority rank are:

- 420-1 Document current O&M practices, coordinate with asset strategy, and evaluate and document O&M costs -- 7

Asset Data and Information

Asset Management depends on data to support all levels of asset management activities throughout the life cycle. Asset hierarchy, naming protocols and data attributes need to be consistently and uniformly developed in order for the data to be effectively used. An appropriate suite of management technology systems and databases provide the capability to assess asset and service status, trends, and needs of the infrastructure assets. Typical capabilities of these systems include:

- Integrated organization of information describing infrastructure relationships, inventory, condition, and performance, including a history over time
- Tracking and management of work on assets and associated costs
- Geographical representation of assets for location, work management and reporting purposes
- Analytic models to predict the rate of future change in condition or performance, enabling the forecast of future infrastructure needs including total cost
- Decision rules or procedures for applying treatments or actions to maintain, rehabilitate, replace, or expand infrastructure, coupled with analytic models and costs to generate financial scenarios for planning
- Reporting including for accounting purposes and tailored to different levels of management, including staff, senior management, Council and public distribution.

Current practice relies on independent databases and spreadsheets that are not linked together or with the spreadsheet inventory used in Finance, with the GIS database, with work management activities or with cost information. This must be independently managed and reconciled.

With the presumption that JDE will continue to be the Town's financial accounting system, major needs requiring a technology application is a central asset registry, work management system(s), and analytical modeling.

Key actions with overall priority rank are:

- 510-1 Develop asset hierarchy from FIR reporting to the maintenance managed item level - 1
- 520-1 Evaluate data collected after identifying required and critical data and identify gaps - 2
- 540-1 Evaluate needs, develop user requirements for software and develop Terms of Reference (TOR) for procurement (Phase 2 of this project) - 18

-
- 540-2 Procure asset management software, and configure, and implement, and identify key integration points with JDE - 20

Monitoring & Improvement

It is important for the Town when considering needs across the organization to have a common framework to assess the importance of needs in different areas. One parameter that is used is Risk that relies on condition (as a proxy for failure) and consequence of failure. It is important therefore to have a common framework to assess condition, i.e. good/fair/poor or very good, good, fair/poor etc. As well, condition is only one measure of an assets performance, and a framework for other parameters such as capacity or reliability are also required.

Key actions with overall priority rank are:

- 620-1 Establish standard condition grading framework and align to asset class condition scales -5

Risk Management

Risk management can be applied at all stages of the asset life cycle, whenever a significant decision has to be made. Organizations establish and implement risk management processes to facilitate achieving their objectives and providing the desired level of service. They identify risks that could have a significant impact on their objectives, analyze the probability and the consequences of occurrence, and develop ongoing measures and controls to treat and mitigate risks. A framework for risk management ensures that risks are systematically identified and treated using a consistent and repeatable process.

Key actions with overall priority rank are:

- 710-1 Develop Risk Management Framework - 7
- 720-1 Conduct a risk assessment and identify high consequence assets and critical assets - 7

Decision Making

To ensure that AM decisions are made efficiently and are repeatable (can be understood, traced and validated), a decision-making framework is useful if not essential. It is best to represent the framework, the set of linked and interrelated activities and their sequence, through a business process model. This allows the current (or newly created) process to be analyzed and improved within the context of the organizational structure and resource constraints. Optimized decision-making is an evidence-based process of making the right decisions with the best available data and with decision criteria clearly defined. Data-driven decisions provide the advantage of transparency for decisions made and support determining the lowest cost solution that satisfies values and preferences for risk and other criteria such as community benefit.

The three primary techniques of decision-making in asset management are risk-based analysis (RBA), benefit-cost analysis (BCA) and multi-criteria analysis (MCA). Each technique has its place depending on the decision required.

Key actions with overall priority rank are:

- 810-1 Evaluate, select and incorporate ODM techniques into O&M and capital plan process - 25

Finance

Financial plans and asset reserves should be an outcome of the asset strategy in the asset management plan. Secondly capital plans for the shorter term (e.g.10 years) should be an outcome of the asset management plan and be linked to the financial plan. The financial plan was developed ahead of the asset management plan, and the asset management plan has not influenced the capital plans.

Key actions with overall priority rank are:

- 910-1 Update Capital Financing Sustainability Plan - 21

Data Management

The Town needs to establish a data standard, which will include who owns the data, who can access the data and who is collecting the data. There should be checks on the quality of data collected through a quality assurance/quality control protocol established as part of the data management standards. Data standards should be developed in the context of the Town's asset hierarchy and its requirements for managing asset performance.

Key actions with overall priority rank are:

- 1010-1 Develop data standards aligned with asset hierarchy -2
- 1020-1 Establish data roles - owners, users, collector - 1

5.2 Gap Analysis – Improvement Projects

The primary output of the needs assessment and gap analysis is a list of improvement projects or opportunities. The projects identified are the priorities within each asset management practice area that when completed will move the Town from its current asset management position to its future desired position. Of the 29 identified projects, each has an individual priority established in context of the Town's drivers, the importance of the corresponding asset management practice area, and the Town's current plans and situation.

The estimated duration and resource requirements in months and the estimated cost are shown in the table below.

Table 13: Project opportunities

Item	Effort (months/ \$)	Annual (% or \$)	Annual (% or \$)
Total Duration	87	87 months	60 months
Management (5)	15	3%	5%
Technical staff (1 PM+ support)	31	28%	40%
Stakeholders (15)	29	2%	3%
External Cost (Town staff not included)	\$1,060,000	\$146,207	\$212,000

If all work were scheduled sequentially, the estimated time for completion would be over 7 years (87 months). It is expected that with overlap of projects this could be managed in a shorter manageable time frame of 5 years. Within a 5-year period, this would still be a manageable effort with the existing staff. However, several new resources are recommended to support the asset management system (program) within the Town. This is discussed further in 8.2 Resource Requirements.

The complete list of projects is provided in Appendix K: Asset Management Gaps and Needs.

6 Framework Synthesis

The maturity assessment process identified the gaps between best practice and the current state of the Town's asset management system (program) and the needs to advance the program towards the Town's vision for asset management.

The needs have been translated into individual opportunity project actions prioritized according to the Town's drivers and a logical sequence based on dependencies between the opportunities. To provide focus to these most valuable, practical and urgent opportunities, this section presents different approaches to implement the recommended initiatives and actions. With any approach, all identified opportunities are included and it is only the sequence of implementation that changes because of the focus of the approach.

Town staff was polled during the workshops to review the asset management needs and gap analysis to determine the preferred approach. In brief, the approaches in order of preference by the Town are:

- 1. Governance: priority is given to building Town wide frameworks and organizational capacity**
- 2. Capital Program Decision-Making: focus is improving the decision-making process for capital spending**
- 3. Data and Information: improving data and information standards including technology integration**
- 4. Maintenance Management: schedule CMMS selection and implementation followed/ in conjunction with maintenance program improvement**
- 5. Tactical: schedule all individual projects based on individual priority and resource constraints**

Following is a discussion of each approach. The plan and sequence of the initiatives is presented in Section 8 Implementation Plan.

Governance Approach

Leadership and organizational culture are the two main reasons why implementing an asset management system (program) succeeds. Governance provides a top-down structure where priority is given to building frameworks and organizational capacity for the Town as a whole prior to developing or tailoring the frameworks to the individual asset sectors.

The opportunities to focus on would be organizational – defining and designating positions, roles and responsibilities; training for staff; and include corporate wide frameworks for lifecycle management - condition, risk, and levels of service that can then be customized to each asset sector.

This approach supports a long-term structured process for asset management system (program) development. It facilitates providing guidance and a measure of control from a ‘corporate’ perspective. It is particularly well suited to larger organizations with both corporate and distributed dedicated asset management roles. It can be effective for smaller organizations as well by developing the frameworks simultaneously and collaboratively with service sector stakeholders.

This approach warrants further consideration if there is no urgent need to rapidly progress the asset management system (program) such as might be the case if there is known and significant capital shortfalls.

Capital Programming Decision-Making

This approach focuses on developing the means to identify the optimum balance between asset performance and cost based on real-time performance measures (e.g. condition) aligned with a prescribed service level. It is in effect a microcosm of the asset management plan focusing on asset renewal.

The projects to prioritize are those involved with organizing assets (hierarchy), measuring performance (LOS, condition, risk) and establishing decision criteria (asset strategy). This process to identify the strategies to preserve or extend asset performance and optimize the selection of capital projects can be enhanced with software. This requires predictive analytical modeling functionality. The cost and configuration requirements for this type of software can be much less than that of a CMMS (e.g. 3 months and \$50,000 +/-). Depending on the selection, this software could also act as the central asset register.

While not exactly short term, this approach offers the closest thing to the concept of quick wins since it will directly support the development of annual capital plans. It also aligns well with regulatory reporting requirements. It is a good candidate approach in general and especially where reducing capital spending is a key priority. However it requires that the organization be knowledgeable of the trade-offs involved. Data on costs, condition and interventions may not be fully accurate thus while the decision-making logic could be sound, the confidence in results may not be high. Like in the tactical approach, there should be a strong culture of commitment to asset management to minimize the potential of the implementation faltering.

Maintenance Management

In this approach the focus is on maintenance centered on procurement of a computerized maintenance management system (CMMS). After procurement the real work begins to develop and standardize asset

information at the equipment (maintenance managed item) level, maintenance procedures and maintenance planning and scheduling. This powerful system carries significant resourcing requirements and a sustained long-term commitment to improvement (8 months and \$300,000 +/-). Although estimated as an 8 month implementation period in practice it will take several years before the system is fully embedded and adopted in an organization. It is data intensive and while powerful requires the collection of data over some period of operation before benefits can be obtained through asset performance reporting. A CMMS has the added benefit of being a candidate system to act as the central asset register.

This is a suitable approach for organizations facing issues with maintenance or operating expenditures and controls, poorly performing equipment or frequent failures. A CMMS will assist chiefly with maintenance activities such as scheduling preventive maintenance and assigning resources, predicting equipment reliability problems, and managing inventory. Claimed benefits associated with maintenance through the CMMS include reduction in maintenance overtime, labour, and contractor costs; material costs, and increase in equipment availability.

It should be recognized that maintenance software is a significant investment in time and effort and that benefits to the capital program and long-term renewal planning will not result for quite a long time. This is primarily because maintenance focuses on the shorter-term activities e.g. daily, weekly, and monthly and the equipment data will need to be collected for a few years before it can be used in renewal planning analysis.

Because of the significant resources to procure, implement and provide ongoing support for the CMMS, a more detailed schedule of activities was developed to illustrate the commitment for the CMMS decision. A draft schedule for a CMMS procurement and installation together with costs is provided in the figure below.

Task	Details	2016		2017					2017					2018			
		Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	
Base user requirements	Core functionality	■															
Terms of Reference	Assess Sector needs, IT requirements and issue Request for Proposal		■														
CMMS Governance Team	Establish body; appoint Project Manager; identify team				■												
Staffing - new/repurposed	Appoint cmms functions - data entry, planner/scheduler, system administrator			■													
Selection & Purchase	CMMS Selection & Purchase				■												
Installation	Installation				★												
Core Requirements	Integration scoping; reporting requirements; asset hierarchy					■											
Configuration	Core modules; Inventory data migration					■	■										
Implementation	Maint task development; process development and validation							■									
Acceptance	Integration testing; functional user testing; user training								■	★							
Go Live	Refine/ adjust; ongoing support; ongoing improvement										■		■			■	
Estimated Costs	CMMS Purchase																\$300,000.00
	CMMS annuals maintenance & licenses																\$60,000
	Internal resourcing through to Go Live																\$90,000
	Ongoing staff resourcing (~ 2-3 persons)																\$245,000

Figure 6: CMMS Implementation Details

Data and Information

Focusing on data and information is appropriate when lifecycle practices are sufficiently mature to provide direction for improving data and information standards, and when automation needs are understood well enough to benefit from integrating technology. A data management focus can be used to drive the asset management system (program) but it should be initiated when the asset management system (program) is sufficiently mature. This timing will help avoid the risk of standards and integration needs not reflecting the true needs of the organization.

Tactical Approach

All opportunities are scheduled as individual projects based on individual priority and resource constraints. This is a suitable option if there is no concern about losing focus or having to market the progression of the asset management system in a systematic or themed way. There should be a strong culture of commitment to asset management or the implementation could falter. It also provides flexibility to adjust effort and cost by shifting the start of individual projects. As an approach it is more applicable to organizations that are already well along the maturity scale.

The estimated duration and resource requirements in months and the estimated costs are shown in the table below.

Table 14: Project opportunities

Item	Effort (months/ \$)	Annual (% or \$)	Annual (% or \$)
Total Duration	87	87 months	60 months
Management (5)	15	3%	5%
Technical staff (1 PM+ support)	31	28%	40%
Stakeholders (15)	29	2%	3%
External Cost (Town staff not included)	\$1,060,000	\$146,207	\$212,000

If all work were scheduled sequentially the estimated time for completion would be over 7 years (87 months). It is expected that with overlap of projects this could be managed in a shorter manageable time frame of 5 years. Within a 5-year period, this would still be a manageable effort with the existing staff. However, several new resources are recommended to support the asset management system (program) within the Town. This is discussed further in 8.2 Resource Requirements.

7 Asset Management Software

Management of assets require technology systems to facilitate the activities across the lifecycle of the assets. This ranges from financial accounting, customer information and billing, inventory and work management, asset demand or capacity analysis, and analytical software to help determine when capital investment is required.

There are perhaps 5 major functions that should be considered under the banner of asset management software. These are:

- I. Financial accounting such as for Tangible Capital Asset/Financial Information Return
- II. Asset Register to account for the full inventory
- III. GIS for spatial representation of assets
- IV. Maintenance management (CMMS) for planning and scheduling work on assets
- V. Predictive modelling for asset renewal planning

The Town currently has an Enterprise Resource Planning system (JD Edwards) that it utilizes for financial reporting as well as other corporate functions. The Town also has a GIS application it uses for mapping purposes and to support asset management activities such as maintenance.

Most technology systems for asset management have an asset registry function. This is the case for both JD Edwards and the GIS. What distinguishes the registry in these different systems is the level of detail provided. In JDE the hierarchy detail is high level and does not support the deeper level of detail needed for asset renewal planning or maintenance management. The GIS has a deeper level of detail possibly sufficient for asset renewal planning and maintenance management for linear assets but not for facilities or equipment. Maintenance management of facilities and equipment benefits from systems built specifically for this purpose. The registry in a maintenance management system is likely at the most detailed level required in an organization. The registry required for asset renewal planning will be at a higher level than the maintenance managed equipment level in a CMMS. There isn't a single application available that will perform all the required asset management functions including even these 5 major functions. What is required is a well-defined asset register employed across the different applications to the level of detail required for the function being provided in each application. With each system having its own registry, integration between systems will be required together with good data management practices. Data management is required to avoid issues with duplication and errors in data.

With respect to maintenance management, JDE has maintenance management functionality. At present it is only employed by Fleet and only to a limited extent. The primary reason for the limited use is reportedly due to the difficulty of using this module of JDE.

There are a considerable number of maintenance management systems available for the Town to consider. Some systems can be hosted by the maker and purchased as a service versus the traditional approach where the application would be installed on the Town's servers.

The Town does not have any technology systems that provide predictive modeling asset renewal planning. This type of software should have the capability to configure degradation curves for various asset classes and provide predictive modeling over a long-term period. It should be able to calculate the required asset renewals based on set condition points and provide the value and impact of various investment scenarios over the planning period. The asset register level of detail for asset renewal planning is typically higher than that required for maintenance and deeper than in the Town's JDE software.

In general requirements to be considered in the evaluation of technology systems for either include:

- Ease of use/user interface
- Applicability to multiple asset types – although more than one solution may also be considered
- Ability to integrate with other Town systems
- Vendor experience and references
- Vendor support and training
- Initial and ongoing costs

For either maintenance management or asset renewal planning software, the asset register should be defined and correspond to lifecycle data that should be recorded. For example the level of breakdown required to record repair and replacement information of at least critical assets and components of those assets. This breakdown and data helps to answer questions such as when it is most economical for a watermain to be relined or replaced over its lifetime and at what anticipated cost.

In the Town's Integrated Asset Management Strategy the selection and configuration of maintenance management software is scheduled after the development of the lifecycle data such as asset register, asset performance, data standards, and the approach for asset renewal. After the completion of these improvement projects to better define these practices and identify data, is the appropriate time to evaluate in detail the requirements for the maintenance management software and integration needs.

8 Implementation Plan

The asset management implementation plan will guide the overall development of the asset management system (program) within the Town.

An overview of the plan elements together with the estimated schedule, new resource requirements and cash flow is provided in the figure below:

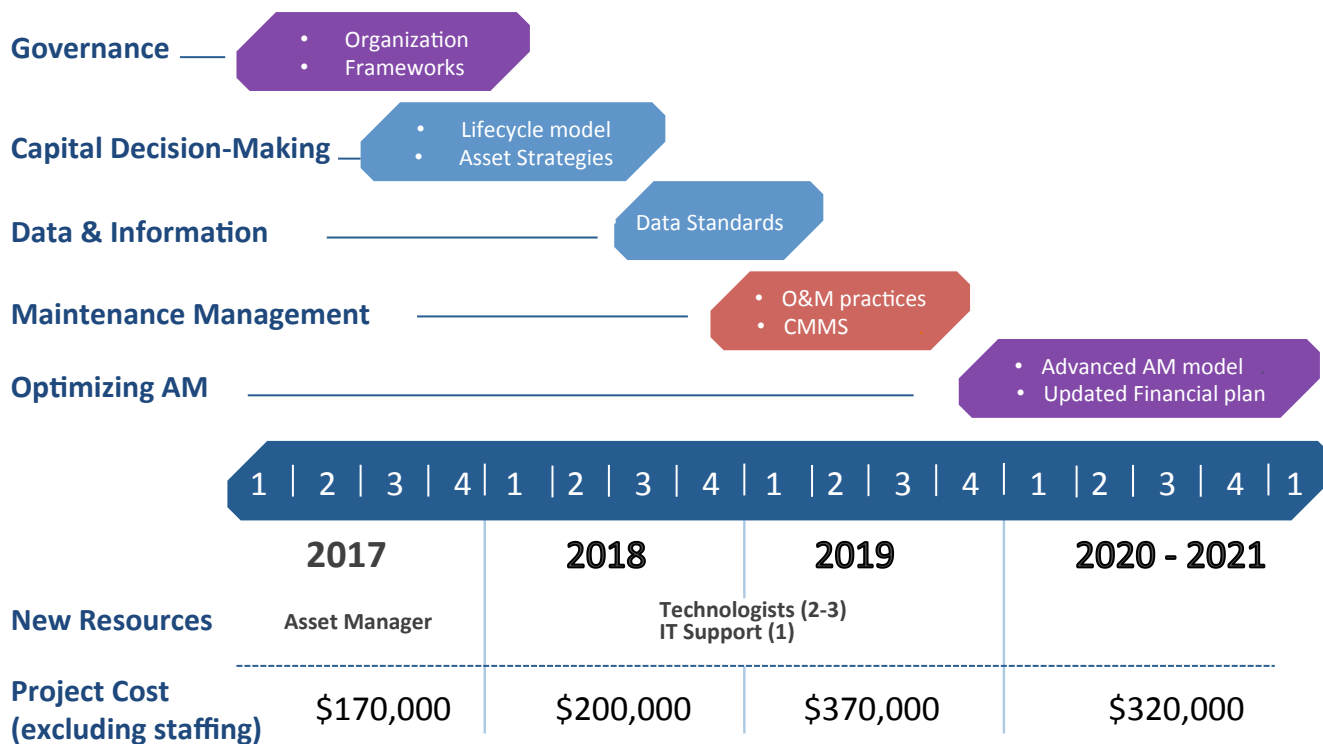


Figure 7: Overview of Implementation Plan

The costs indicated are for the Integrated Asset Management Strategy projects and do not include the cost of the recommended new resources or of the internal costs of staffing during project implementation.

Successful implementation is best assured by considering these factors:

- I. Project management: designating a responsible individual to manage the project(s) and program of implementation initiatives with a focus on developing detailed work plans, resource schedules, budget and performance metrics for monitoring and control. It is recommended that the implementation plan be the responsibility of the recommended asset manager position.
- II. Communications: regular and focused reporting on progress of the asset management system (program).
- III. Leadership: endorsement of the plan and ensuring adoption of concepts and practices across the organization paying attention to change management principles. It is recommended that the AM Committee provide leadership for the asset management system (program) with reporting to the Town’s Operations Leadership Team (OLT). In addition a new position is recommended for Asset Manager that will also contribute to leadership of the program.

- IV. Staff Development: knowledge transfer during project implementation from vendors, and training to improve technical capabilities for delivery of asset management practices.
- V. Integration and Transformation: managing disruption to existing operations while transitioning to new practices and fostering commitment of staff to program development.

These factors should be adopted and/or embedded as part of the rollout of the implementation plan.

8.1 Implementation Project Schedule

The overall project Gantt chart is provided in Appendix L: Implementation Schedule.

The table below provides the summary details of the program objective start and end times as well as the costs.

Table 15: Implementation Plan Schedule

Program Objective	Project Costs	Start	End	Months
Governance	\$140,000	09-Jan-17	26-Dec-17	12
Capital Program Decision-Making	\$150,000	05-Jun-17	29-Aug-18	15
Data and Information	\$110,000	04-Jun-18	02-Apr-19	10
Maintenance Management	\$320,000	29-Oct-18	22-Nov-19	13
Optimizing the Asset Management program	\$340,000	25-Nov-19	21-Dec-21	25
	\$1,060,000			

8.2 Resource Requirements

The workforce demand forecast, provided in Table 16: Resources to implement strategy (days), is an estimate of the number and mix of employees required in the future to sustain the asset management system. This is additional to the effort required by staff during the delivery of the individual improvement projects.

Resource Requirements – Program Development

A detailed list of resource requirements to implement the proposed strategy across the organization is provided in the table below.

Table 16: Resources to implement strategy (days)

Program Objective	Management	Technical Staff	Stakeholders
Governance	41	72	56
Capital Program Decision-Making	23	73	45
Data and Information	48	75	56
Maintenance Management	30	128	160
Optimizing the Asset Management program	62	96	78
Approximate total staff resources	204	444	395

Resource Requirements – Ongoing

Based on the current level of practice of asset management within the Town and the requirements to continuously deliver at the higher level anticipated in this strategy, additional staff resources would be required. The positions and responsibilities are:

- Asset Manager: oversee and provide direction across the Town to implement asset management practices in a coordinated and integrated fashion.
- Technical staff: technologists or engineers to develop and support asset specific programs to measure and monitor asset performance, collect, manage and analyze asset data, and produce capital plans
- Information Technology staff: support the configuration and ongoing maintenance of asset management software including a computerized maintenance management system (CMMS), advanced (capital) decision-making software, and the integration of various systems to facilitate asset management.

An estimate of the staff resource requirements to support the asset management system for the 5-year period of the Strategy and ongoing past that time frame is provided in the table below. The resources are estimated based on the gap between the current maturity level and the end state maturity level during and after the 5-year period of the implementation plan.

Table 17: Ongoing staff support

Program Objective	Asset Manager	Technical Staff	IT Support
Governance	½		
Capital Program Decision-Making	¼	½ - 1	½
Data and Information	1/8	½ - 1	
Maintenance Management	1/8	1 - 2	½
Optimizing the Asset Management program	¼		½
Approximate total new staff resources	1	2 - 4	½ - 1 ½

Considerations for the structure the Town should consider to support asset management and considerations for the Asset Manager position are provided in the next section.

8.3 Asset Management Program Governance

The potential organizational model necessary to govern asset management and the proposed Asset Management Strategy to ensure the program remains integral to the Town-wide financial, operational and strategic planning is discussed herein.

The governance model should organize at a high level all functions of the asset management program such as operational, financial, risk management, and reporting processes. This is done so that the business units can conduct their activities in ways that comply with objectives and strategic outcomes set by the organization.

The proposed governance framework is comprised of three layers as depicted below:

Table 18: Governance components

Layer	Meaning	Scope
Structure	Includes organization design and reporting structure, and operating charter or mandate	Operational Leadership Team; Asset Management Committee
Roles and Responsibilities	Within the context of asset management in the Town and the asset management framework, this defines functional roles and responsibilities	Initially it should include OLT, the AM Committee and the recommended Asset Manager position
Framework and Program	An asset management framework used to direct, coordinate and control asset management activities	Asset management framework as described in the Asset Management Policy

8.3.1 Structure

In the Town's Corporate Asset Management Policy (Policy No. CAO.4-01), governance of the asset management program is addressed by identifying the responsibilities of the Strategic Leadership Team and the Operational Leadership Team for asset management. It does not specifically address the how asset management will be delivered although it is implied that it is through the existing organizational structure. There are two main viewpoints for the governance structure of the asset management program, either a distributed model or a corporate model.

In the first model type, asset management is a business unit like many others. As a business unit it has a particular focus and interactions with other business units. Asset Management is placed as a business unit within the department organizational reporting structure (the organization chart). Interaction is coordinated to a greater or lesser extent outside of and within the department based on the needs identified at the time the business unit is formed and organically as it evolves over time. This is consistent with a distributed model of responsibilities for delivery of asset management.

In the second view, development of asset management as an objective stands outside of the organization reporting structure and is therefore governed by a committee of representatives from the stakeholder groups that influence or are impacted by asset performance and asset management. Effectively this is a corporate structure.

The main difference between these approaches is how formal the asset management program is regarded and the focus of how it is to be delivered. A corporate structure is regarded as best practice and is recommended. This provides better oversight across the organization and removes bias that might occur if asset management oversight is located within a functional department such as Finance or Engineering. For this reason administratively it is best that the position report to the CAO's office.

8.3.2 Roles and Responsibilities

Asset Management Committee

The key objectives for the Asset Management Committee should be:

- I. Advise on organizational design for asset management responsibilities throughout the Town's business units.
- II. Ensure consistency in asset management concepts and practices and approve departmental flexibility of implementation
- III. Approve strategic planning that addresses current and future asset management challenges and objectives
- IV. Direct the Asset Manager to address the development of asset management and the asset management strategy

The current charter of the Asset Management Committee includes details outlining the scope of responsibilities that meet many of the requirements described above. It does not address the organization design or skill requirements for asset management. It assigns some level of authority for directing the work of the Committee to the Committee Lead. The Committee Lead is intended to be a rotating responsibility, noting that the rotation is not yet in effect. It assigns the responsibility for the implementation of asset management practices to the committee membership that is comprised of representatives of various departments. In a general sense this is beneficial but without direction through preferably both the Committee Lead (recommended to be the new Asset Manager) and the Integrated Asset Management Strategy (this report), the advancement of asset management will be fragmented.

To strengthen the function of the Committee and of the advancement of the asset management program, the Asset Manager position should be assigned as the Committee Lead. It is also recommended that in selecting and developing workplans for the projects from the Integrated Asset Management Strategy that the Committee representatives review and approve them by actively participating in Committee affairs.

Asset Manager Position

Adopting a position for an Asset Manager is a key requirement to provide better assurance of the successful development of a consistent and integrated asset management system in the Town. This position would be responsible for the overall implementation of asset management. Ideally it would be at a management level so it would have a higher level of authority and visibility within the Town.

Considerations for the skills, abilities and experience of the Asset Manager are ability to:

- Provide direction to others in implementation of asset management strategy and development of the asset management system (program)
- Guide others on the full range of principles of Asset Management activities and assist departments with application to asset service sectors
- Undertake the analysis and development of asset management policies
- Understanding of asset management maturity capability development
- Lead and evaluate compliance reviews of the asset management system within departments
- Contribute to the specification, selection and integration of Asset Management information systems

Skills and experience to be considered include:

- A degree in Engineering or Business or related field with equivalent combination of education and experience
- Knowledge of Canadian and international asset management standards and best practices

-
- 10 years of experience in the planning, implementation and application of asset management procedures, practices, tools and techniques including policy and strategy, levels of service, risk and lifecycle analysis, prioritization and financial planning and analysis
 - Strong communication, facilitation and interpersonal skills
 - Strong technical, analytical and problem-solving capabilities

The skills and experience outlined above are those typically referenced for this type of position. It would be at the Town's discretion to adapt these requirements to suit their own needs.

8.3.3 Framework and Program

The Town's Corporate Asset Management Framework is included within the Asset Management Policy (Policy No. CAO.4-01). It is noted to encompass all aspects of the management of each asset through its lifecycle in that it:

- Integrates the strategic objectives of the Town, with key business systems, legislation, and regulations;
- Creates a framework that establishes the mechanism for a clear line of sight between our AM program and Corporate objectives and strategies; and
- Commits to providing approved levels of service for present and future customers and communities, in the most effective and efficient way, through the planning, design, construction, acquisition, operation and maintenance, renewal, and disposal of assets.

The Corporate Asset Management (AM) Policy applies to assets of the Town, such as roads, sidewalks, bridges, watermains, sewers, stormwater ponds, pumping stations, fleet, IT systems, buildings, parks, art and trees. It is shown in the figure below.

Corporate Asset Management Framework



Figure 8: Newmarket Corporate Asset Management Framework

Appendix A: Maturity Assessment Questionnaire

Table 19: Asset Management Maturity Assessment Areas, Elements and Questions

Q#	Assessment Area	Ref #	Assessment Element	Question
1	Strategy and Planning	110	Asset Management Policy	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?
2	Strategy and Planning	120	Asset Management Strategy	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?
3	Strategy and Planning	120	Asset Management Strategy	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?
4	Strategy and Planning	130	Master Plan	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?
5	Strategy and Planning	140	Asset Management Plan	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?
6	Strategy and Planning	140	Asset Management Plan	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.
7	Strategy and Planning	150	Contingency Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?
8	Strategy and Planning	160	Asset Strategy	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it

Q#	Assessment Area	Ref #	Assessment Element	Question
				include determining benefit and cost of implementing the asset strategy?
9	Performance and Demand	210	LOS	Have the Levels of Service been identified and the link between performance, risk and cost been established?
10	Performance and Demand	220	Asset Demand	Has the organization established demand-forecasting methodologies and identified plans for long term needs?
11	Organization and People	310	Asset Management Structure	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?
12	Organization and People	320	Competency	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?
13	Organization and People	330	Outsourcing	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?
14	Life Cycle Practices	410	Acquisition	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.
15	Life Cycle Practices	420	Operations & Maintenance (O&M)	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?
16	Life Cycle Practices	430	Performance Modelling	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?

Q#	Assessment Area	Ref #	Assessment Element	Question
17	Asset Data and Information	510	Asset Hierarchy	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?
18	Asset Data and Information	520	Asset Management Data	Has the organization identified the asset related data it requires to support the asset management activities?
19	Asset Data and Information	530	Asset Management Data Availability	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data? Has the organization identified gaps with respect to required data?
20	Asset Data and Information	540	Information Systems	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?
21	Monitoring & Improvement	610	Performance Assessment	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?
22	Monitoring & Improvement	620	Condition Assessment	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?
23	Monitoring & Improvement	630	Performance Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?
24	Risk Management	710	Risk Management	Is there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?
25	Risk Management	720	Risk Assessment	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?
26	Decision Making	810	Optimized Decision Making	Has the organization developed and implemented a method for optimized decision-making?

Q#	Assessment Area	Ref #	Assessment Element	Question
27	Decision Making	820	Capital Plans	Is there a process to identify the long-term asset renewal and rehabilitation requirements and integrate plans across service sectors?
28	Decision Making	830	Capital Projects Integration	Has the organization integrated capital projects across all service areas?
29	Decision Making	840	Non-Capital Projects	Is there a process to identify non-capital projects (e.g. major maintenance projects)?
30	Finance	910	Financial and Funding Strategy	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?
31	Finance	920	Reserve Fund	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?
32	Finance	930	PS3150	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?
33	Data Management	1010	Data Standards	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?
34	Data Management	1020	Data Owner	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?
35	Data Management	1030	Information Quality	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?
36	Data Management	1040	Communication	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?

Appendix B: Town Results

The Town’s maturity scores and levels are obtained by calculating average maturity score of the following service or support areas:

- Right of Way (roads network)
- Water & Wastewater
- Facilities
- Fleets
- Parks
- Information Technology (IT)
- Support Service

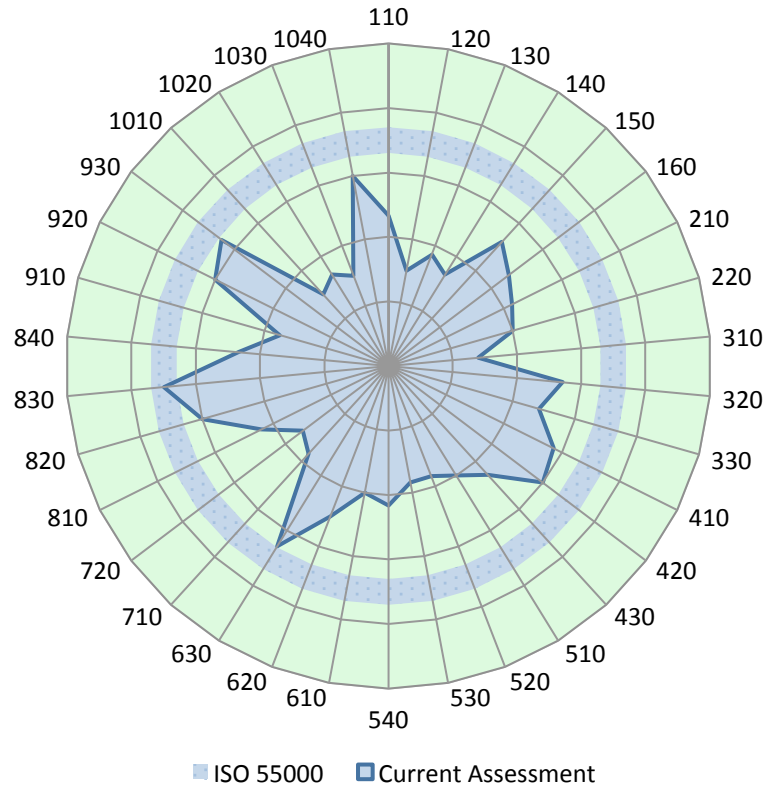
The Town has attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 20 below defines the overall AM Maturity levels for the assessment areas.

Table 20: Maturity Level of Assessment Areas – Corporate (Town)

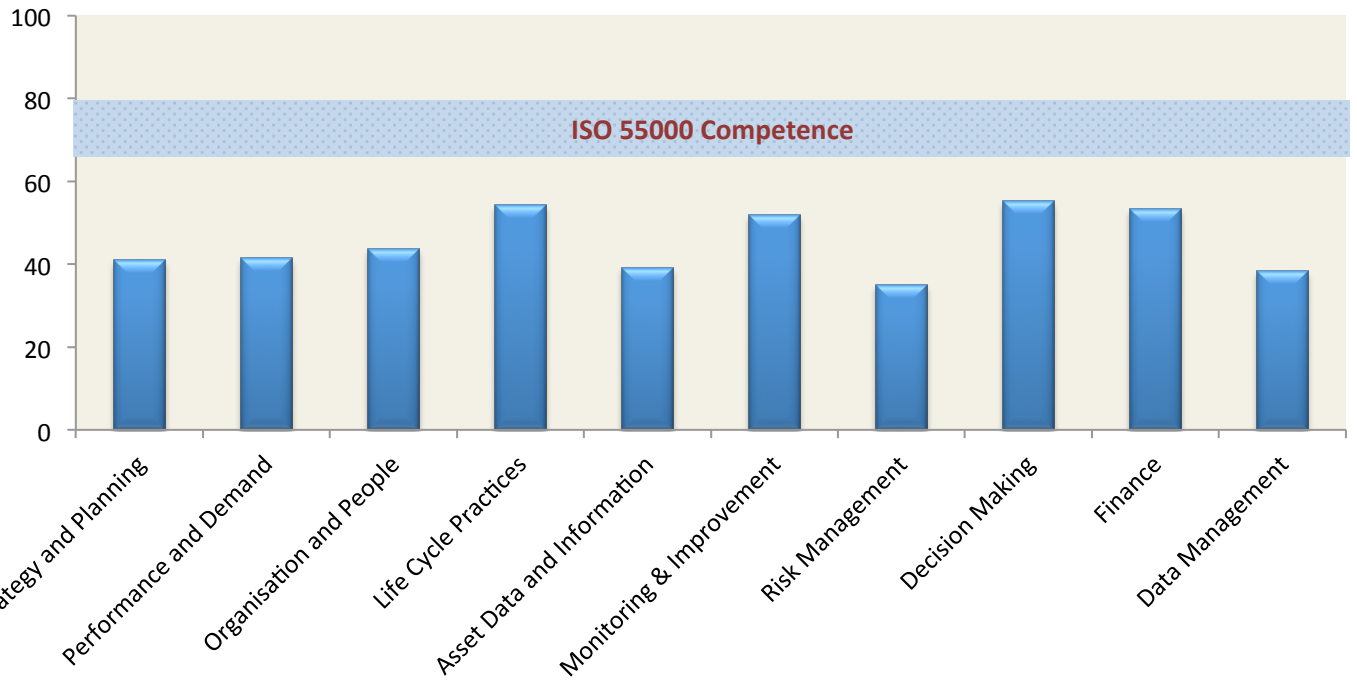
ID	Assessment Area	Score	Status
100	Strategy and Planning	41	Establishing
200	Performance and Demand	41	Establishing
300	Organization and People	44	Establishing
400	Life Cycle Practices	54	Establishing
500	Asset Data and Information	39	Aware
600	Monitoring & Improvement	52	Establishing
700	Risk Management	35	Aware
800	Decision Making	55	Establishing
900	Finance	53	Establishing
1000	Data Management	38	Aware
	Average Score	45	Establishing

Asset Management Maturity Assessment Results – Town (Elements)



<p>100 Strategy and Planning</p> <p>110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy</p>	<p>200 Performance and Demand</p> <p>210 LOS 220 Asset Management Strategy</p>	<p>300 Organization and People</p> <p>310 Asset Management Structure 320 Competency 330 Outsourcing</p>	<p>400 Life Cycle Practices</p> <p>410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling</p>	<p>500 Asset Data and Information</p> <p>510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems</p>
<p>600 Monitoring & Improvement</p> <p>610 Performance Assessment 620 Condition Assessment 630 Performance Improvement</p>	<p>700 Risk Management</p> <p>710 Risk Management 720 Risk Assessment</p>	<p>800 Decision Making</p> <p>810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects</p>	<p>900 Finance</p> <p>910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150</p>	<p>1000 Data Management</p> <p>1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication</p>

Asset Management Maturity Assessment Results – Town (Areas)



Appendix C: Right-of-Way Sector Assessment Results

Current State Assessment Workshop Details

Workshop Date: Thursday 14 July 2016

Workshop location: Corporate Training Room

Table 21: Right-of-Way workshop participants

Attendee	Position/Organization	Attendee	Position/Organization
Dave Coules		Rod Smith	
Mark Gregory	Roads Supervisor / Town	Jamie Taylor	
Dan Harman		Lisa Ellis	Business Performance Coordinator / Town
Mark Lastowski		Dean Rurak	Yaku Consulting
Gord MacMillan		Amir Ebrahimi	Yaku Consulting
Eugene Peerce		Khurram Aziz	Yaku Consulting

Assets in the Sector

Table 22: Right-of-Way Assets

Class	Type - Description	Responsibility
Roads	Local, Collector (247 Km)	PW - Roads
Entrance features	49 structures spread throughout 27 locations	PW - Roads
Boulevards		PW – Roads/Parks
Sidewalks		PW - Roads
Parking Lots	Parking lots (84 with 834,320m2)	PW - Roads
Bridges	Bridges (33)	PW - Roads
	Culverts (39)	PW - Roads
Retaining Walls	Retaining walls (57)	PW - Roads
Traffic Signalization		PW - Roads
Street Lighting	Street lights (7,758)	Newmarket Hydro
Salt/Sand Storage structure		Facilities
Fleet	Utility & Trucks, Plows, and etc.	Fleet
Related	Trails & walkways	Parks
	Storm Sewer	To be determined
	Stormwater Ponds	Engineering

Asset lifecycle activity management

Other than as indicated in the table above, Roads group relies on following for assistance with major lifecycle activities, or provides the following additional services:

- V. Multi-year contract for road needs study including assessment of approximately 25% of all roads annually and recommendation for capital works

- VI. Winter clearing is delivered partly by Operations and partly through contractors
- VII. Operations of stormwater is by Water and Wastewater with planning completed by Engineering
- VIII. Boulevards - Roads responsible for construction, Parks for maintenance

Assessment Results

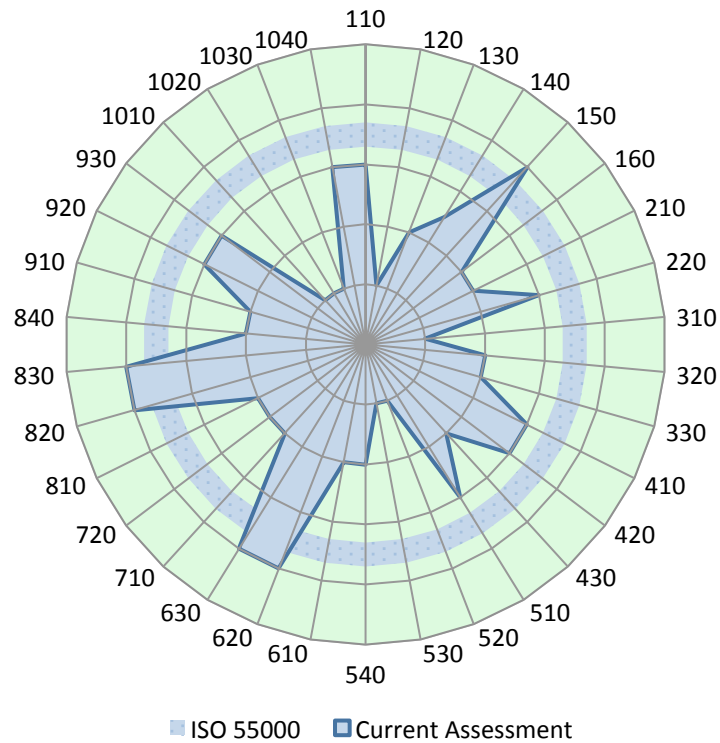
Right-of-way sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 23 below defines the overall AM Maturity levels for the assessment areas.

Table 23: Maturity Level of Assessment Areas - Right-of-Way

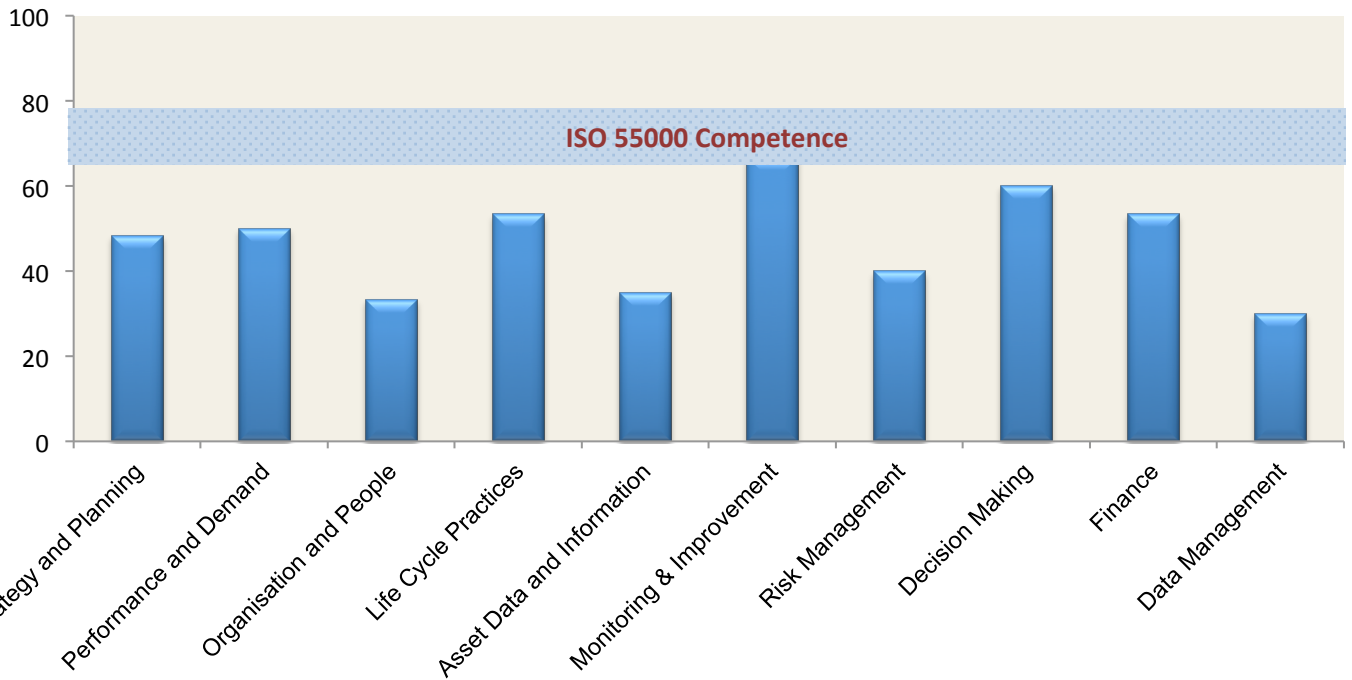
ID	Assessment Area	Score	Status
100	Strategy and Planning	48	Establishing
200	Performance and Demand	50	Establishing
300	Organization and People	33	Aware
400	Life Cycle Practices	53	Establishing
500	Asset Data and Information	35	Aware
600	Monitoring & Improvement	67	Developing
700	Risk Management	40	Establishing
800	Decision Making	60	Developing
900	Finance	53	Establishing
1000	Data Management	30	Aware
	Average Score	47	Establishing

Asset Management Maturity Assessment Results – Right-of-Way (Elements)

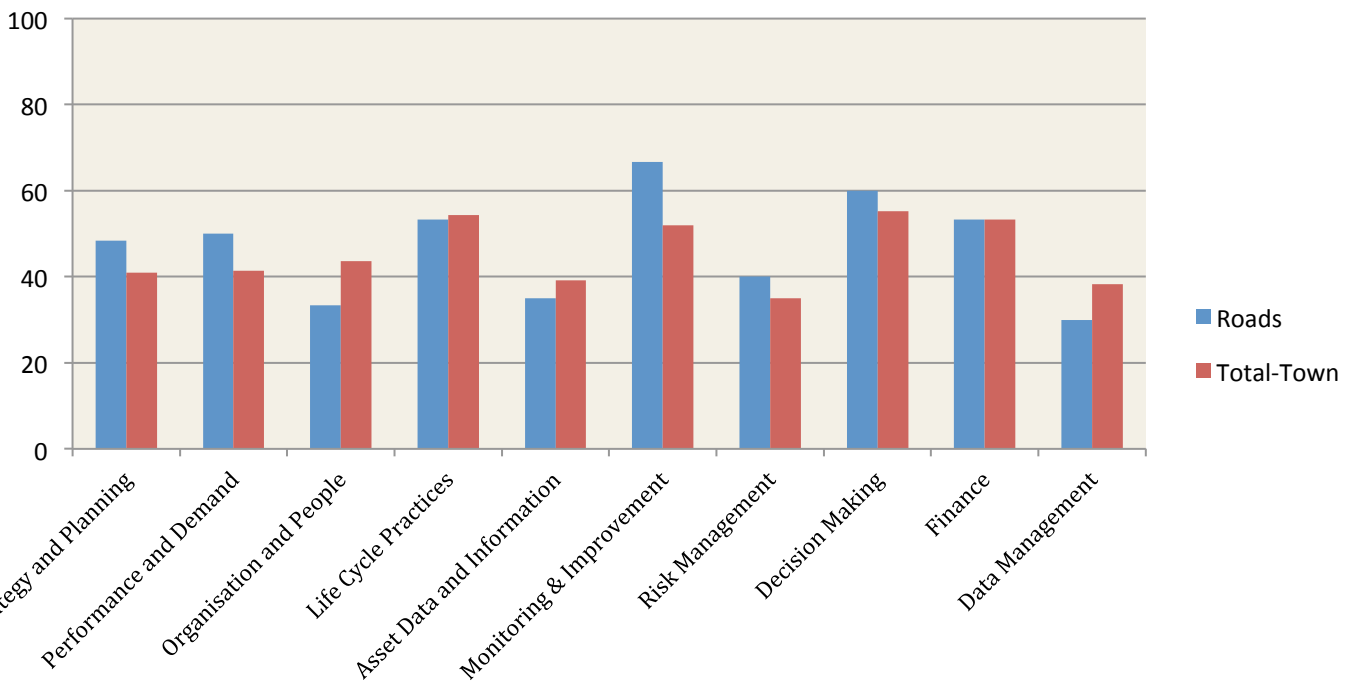


100 Strategy and Planning 110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy	200 Performance and Demand 210 LOS 220 Asset Management Strategy	300 Organization and People 310 Asset Management Structure 320 Competency 330 Outsourcing	400 Life Cycle Practices 410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling	500 Asset Data and Information 510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems
600 Monitoring & Improvement 610 Performance Assessment 620 Condition Assessment 630 Performance Improvement	700 Risk Management 710 Risk Management 720 Risk Assessment	800 Decision Making 810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects	900 Finance 910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150	1000 Decision Making 1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication

Asset Management Maturity Assessment Results – Right-of-Way (Areas)



AM Maturity Comparison Chart - Right-of-Way & Town



Assessment Questionnaire and Evidence

Table 24: Right-of-way Assessment Evidence

Q #	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?	3	AM policy has been issued and circulated; although it was identified that circulation is limited. Staff was communicated the AM policy through Town hall meetings and the policy was also circulated through email, however, not all staff members are aware of AM policy availability (e.g. operation staff were not aware) AM policy is provided at corporate level and not department level.
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?	1	No documented AM strategy. Staff indicated that some isolated documents and policies can be found about the various practices in place (e.g. Road Needs Study), however, most of the work is carried out based on staff knowledge and past practices. No asset management assessment and gap analysis has been carried out. Management is aware, however, there is a lot of work required to cover life cycle needs and strategies. Initially, level 2 was recommended but after discussion, this element was assessed to be at level 1
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?	1	No documented AM strategy. Management is aware, however, there is a lot of work required to cover life cycle needs and strategies.

Q #	Assessment Area	Question	Score	Evidence - Summary
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	2	No specific master plan in place. However, a number of plans are in place, for example, a transportation plan and a secondary plan that includes new roads needs for next 20 years (focuses on growth, e.g. Yonge and Davis plan, but does not cover existing roads). This element identified as between level 1 and 2, however, level 2 recommended as the Town has a secondary plan in place for growth.
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	3	AM plan is in place; however, it is not aligned to the AM objectives. It is also not well communicated to the staff, as several of participants were not aware of it. A formal AM plan is documented, but it is not integrated with the Town's practices. AM plan is not aligned with AM strategy, as there is no AM strategy in place. Level 2 was initially identified, however, after discussion; level 3 was ascertained for this element.
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.	2	Road Needs Study is used to analyse the risks. The study identifies the worst 10% road sections that are then visually inspected by the staff to determine the level of risk on a 1-5 scale. The Road Needs Study doesn't go into details like condition of potholes or condition of curbs. These are identified through either ticket generated by residents or during visual inspections by the staff. Once identified, they are also ranked on a 1-5 scale. Risk process for capital planning is in place.

Q #	Assessment Area	Question	Score	Evidence - Summary
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	4	<p>Emergency plans and protocols (e.g. fire, flooding) are in place as per provincial regulations and documented in the Town Emergency Plan, prepared with the Fire department.</p> <p>Training is in place for the Town's staff (operation staff, supervisors etc.)</p> <p>The town has a 24/7 emergency plan including 24/7 on-call staff. Emergency equipment is also in place.</p> <p>This element was initially rated as level 3, however, revised to a rating of 4 after discussion.</p>
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	2	<p>The asset strategy is documented in the AMP but not formally applied. The annual Road Needs Study identifies the top 10% of bad roads in need of R&R. Each year, consultants visually inspect 25% of the roads plus the top 10% worst roads previously identified through the Road Needs study. The results are prioritized into R&R requirements for the next 5 years and from years 6-10, which is used for planning purposes.</p> <p>The main driver for selecting 'strategy' is cost and budget, the focus is not on levels of service (LOS), however, technical issues are considered in decision making.</p> <p>It should be noted that while this element is assessed as having level 2, many components of asset strategy are in place, however, they need to be documented and formalized.</p>

Q #	Assessment Area	Question	Score	Evidence - Summary
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	2	KPIs are identified in AMP. Levels of service are defined for O&M, however, link between levels of service, risk and funding requirements is not defined or investigated. The Town conducts Surveys and has an e-Ticket system in place for customer complaints. This element is assessed as a level 2 for roads and 3 for bridges.
10	Demand Analysis	Has the organization established demand forecasting methodologies and identified plans for long term needs?	3	Active transportation network document for development of trials for walking and cycling lanes has been developed. The development will be the responsibility of Roads, while parks will do the maintenance. Secondary plan is in place; however, participants were not sure if it includes demand forecasting. This element assessed at level 3, subject to confirmation from Mark that demand forecasting is done.
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	1	No specific AM roles or responsibilities have been identified. An Asset Management Committee has been established.
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	2	Although AM roles are not defined clearly, there are AM practices in place (e.g. operation and maintenance). Staff are provided 'traditional' training (e.g. health and safety training), however, training relating to the analysis and assessment of assets is not provided.

Q #	Assessment Area	Question	Score	Evidence - Summary
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?	2	The Town has a good control process in place for managing the consultant that performs Road Needs Study. Performance review for tender services is done yearly (performance policy) but not linked to asset management strategies and plans. Performance review is also in place and health and safety requirements are checked. Currently assessed as a level 2 as there is room for improvement to arrive at level 3, however, moving towards a level 3.
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified conditions and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	3	Design standards are in place for roads and bridges, but weak from an enforcement/application point of view. Commissioning activities are not documented.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out under specified conditions and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M costs of its assets?	3	Most of assets have standard O&M procedures documented in Town of Newmarket Maintenance Standards including the frequency (e.g. 3-4 years, every catch basin should be done). O&M staff is aware and follow the procedures. Job task forms are developed for O&M activities, however, these are not systematic, and O&M is mainly performed through staff knowledge. Work order process is defined, and captures maintenance in the JDEdwards system. The system tracks time and material for cost calculations.

Q #	Assessment Area	Question	Score	Evidence - Summary
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?	2	Useful life is determined informally through staff knowledge, but not clearly documented. Deterioration curves are not developed – it is felt that there is not enough data to generate them
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	3	For capital planning purposes, hierarchy of roads is defined (arterial, collector, local etc., as category 3-6). Some data is collected for all roads regardless of hierarchy. No linkage between data collection and hierarchy. For O&M tasks, there is some level of linkage as task prioritization may be done based on hierarchy.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	1	Data is not formally identified. A list of required data is not available. Assessed at level 1, however, within the AM Plan, certain KPIs have been identified, but not fully. Staff is aware of the gap in this area.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data? Has the organization identified gaps with respect to required data?	1	Data is collected; however, data is fragmented and incomplete. Staff acknowledged that they won't be able to provide a list of assets with a high degree of confidence level. This element is assessed as a level 1; however, it is close to level 2.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	2	JDE for maintenance (add time to work orders) and financial reports. GIS data available for roads, streetlights, catch basins with road segment identification number, however, data is incomplete. Excel sheets for roads and bridges inventory. Different IDs used in different systems.

Q #	Assessment Area	Question	Score	Evidence - Summary
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?	2	Besides condition assessments, for sidewalks, customer complaints of trips and falls are considered. Customers indicate this through the Sidewalk Patrol Program software that identifies the location of the incident through GPS. Inspection of the location is done, and work scheduled as required. (Michelle, the environmental coordinator for the Town of Newmarket is responsible for this system and has her own budget in the Annual Budget.
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	4	Condition assessment program is in place for most of the assets (roads, bridges, sidewalks, side rails, retaining walls), however, frequency is <u>not</u> determined based on cost and risk. See description of Roads Needs Study in Q 8. 2200-2300 catch basins are inspected yearly (out of a total of around 7000). The results are stored in an excel sheet and failures are prioritized on a 1-5 scale based on their importance (e.g. location, size)
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	4	The process to identify potential problems and investigate the cause of failure is in place; however, it is done on a case-to-case basis; i.e. if there is a major failure it will be investigated although there is no formal process. For major failures (e.g. failure of a bridge that occurred last winter) investigations are carried out and root causes analysis identified. Recommendations and preventive actions are also suggested.

Q #	Assessment Area	Question	Score	Evidence - Summary
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?	2	A formal documented process for risk assessment or management is not in place. For bridges, the condition assessment process is based on the legislated Bridge Code.
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	2	For roads, traffic density (or volume) is used in some part to determine criticality. For remaining assets, there is no formal list of critical assets; however, staff opinion informally considers criticality as required. (E.g. bridges on collectors are more critical than bridges on local roads etc.)
26	Decision Making	Has the organization developed and implemented a method for optimized decision making?	2	A formal optimized decision making process is not in place. Decision making is primarily based on staff knowledge. Maintenance activities (like Spring sweeping, crack sealing and centre line painting) are carried out on a routine or as required basis. For roads, the Road Needs Study is in place that assists in decision making to a limited extent.
27	Decision Making	Is there a process to identify the long term asset renewal and rehabilitation requirements and integrate plans across service sectors?	4	Staff identified that a 10-year capital plan for roads is completed. It is integrated with other service areas like water and wastewater. Overall process is in place; however, improvement can be done, especially in ODM. (It was observed that the same amount is allocated for roads every year, which is a budget and not a capital plan).

Q #	Assessment Area	Question	Score	Evidence - Summary
28	Decision Making	Has the organization integrated capital projects across all service areas?	4	Roads program is tweaked through input from sewer and water. Capital plans are integrated with other service areas like water and wastewater through the annual budget approval process.
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?	2	Non-capital projects are identified and completed based on budget availability. Identification is done mainly through complaints from the residents, routine inspection or from the Road Needs Study.
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?	2	No formal zero based budget planning is done. All budgets are currently 1-year, however, the town is moving towards a 3-year program.
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	3	Some reserve funds are available, however, participants are not sure if it meets target. The score for this question was reviewed with finance staff and changed from 2 to 3.
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?	3	Participants are not qualified to answer this question
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?	1	Data standards for bridges are available. Some documentation on data for assets is available but it is very limited.

Q #	Assessment Area	Question	Score	Evidence - Summary
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	1	Data owners are not clearly defined. Current responsibility for data lies with silo owners although it is not formally defined.
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	1	Some data validation is in place mainly for data collected from consultants (e.g. validation of Road Needs Study results is done through staff review including visual inspection of identified bad roads. However, a formal information quality or validation process is not in place.
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	3	A "Town hall" event for all staff is held for communication of information. In addition, email messaging to all staff is used. However, a comprehensive communication plan w.r.t AM is not in place. Some efforts for improvement in communication are made (e.g. a senior leadership action team was constituted for communication), but staff availability and interest is a hindrance.

Appendix D: Water and Wastewater Sector Results

Current State Assessment Workshop Details

Workshop Date: Thursday, July 21, 2016

Workshop location: Operations Meeting Room

Table 25: Water and Wastewater Workshop Participants

Attendee	Position/Organization	Attendee	Position/Organization
Bob Pickett	Cole Engineering	Alison Day	Town of Newmarket
Nadeem Haque	Cole Engineering	Graham Hackson	Town of Newmarket
Bill Wilson	Town of Newmarket	Gord MacMillan	Town of Newmarket
Christian Saunders	Town of Newmarket	Jeff McElroy	Town of Newmarket
Jamie Cleland	Town of Newmarket	Amir Ebrahimi	Yaku Consulting

Assets in the Sector

Table 26: Water and Wastewater Assets

Class	Type - Description	Responsibility
Water Pipes	287 km of watermains, with 2,761 valves	PW – W&WW
Sewerage	253 km of sewers and 4,066 manhole covers	PW – W&WW
Storm Sewers		PW – W&WW
Stormwater Ponds		PW – W&WW

Assessment Results

Water and Wastewater Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

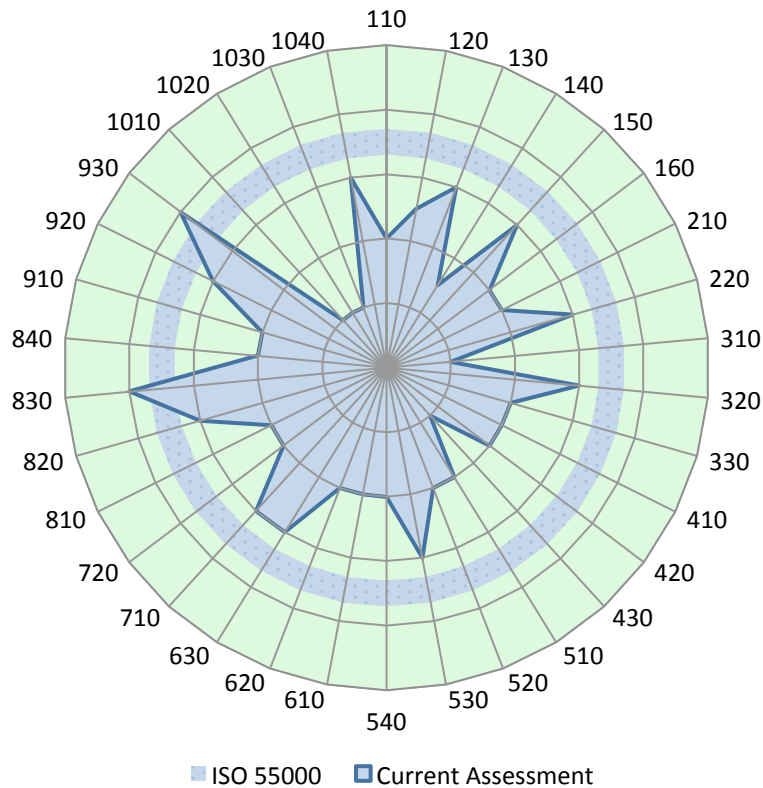
Table 27 below defines the overall AM Maturity levels for the assessment areas.

Table 27: Maturity Level of Assessment Areas – Water and Wastewater

ID	Assessment Area	Score	Status
100	Strategy and Planning	47	Establishing
200	Performance and Demand	50	Establishing
300	Organization and People	40	Establishing
400	Life Cycle Practices	33	Aware
500	Asset Data and Information	45	Establishing
600	Monitoring & Improvement	47	Establishing
700	Risk Management	50	Establishing
800	Decision Making	55	Establishing

ID	Assessment Area	Score	Status
900	Finance	60	Developing
1000	Data Management	30	Aware
	Average Score	46	Establishing

Asset Management Maturity Assessment Results - W&WW (Elements)

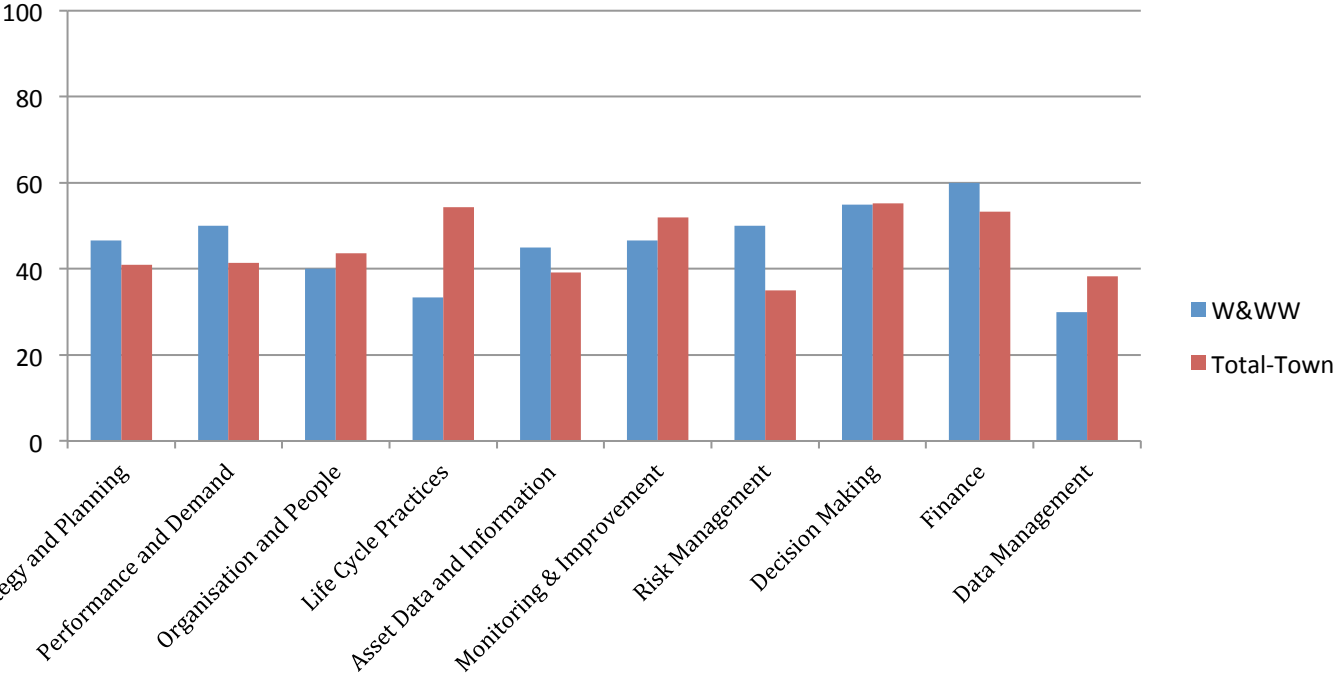


100 Strategy and Planning 110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy	200 Performance and Demand 210 LOS 220 Asset Management Strategy	300 Organization and People 310 Asset Management Structure 320 Competency 330 Outsourcing	400 Life Cycle Practices 410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling	500 Asset Data and Information 510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems
600 Monitoring & Improvement 610 Performance Assessment 620 Condition Assessment 630 Performance Improvement	700 Risk Management 710 Risk Management 720 Risk Assessment	800 Decision Making 810 Optimized Decision Making 820 Capital Plans 830 Capital Projects 840 Non-Capital Projects	900 Finance 910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150	1000 Decision Making 1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication

Asset Management Maturity Assessment Results - W&WW (Areas)



AM Maturity Comparison Chart - Water and Wastewater & Town



Assessment Questionnaire and Evidence

Table 28: Water and Wastewater Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?	2	Not communicated across the organization. Some of the participants were not aware that there is an AM Policy in place. AM Policy is not well communicated.
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?	2	No formal strategy and planning or gap analysis has been conducted. They know that it has to be established. AM Strategies are being defined and the organization is in the process of establishing them.
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?	3	Watermain and Sewer replacement life expectancies are known. Work is done in conjunction with engineering department. So there is some connection between Master Plan and the Asset Management Plan but it is in the process of being better established.
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	3	Somewhere between 3 and 4. Therefore a 3. AM Plan is not fully integrated with Master Plan. For example, the department has considered sizing for water mains, fire flows and have planned for an underground storage facility in 2036. They do have a master plan but it is not linked to other plans. They think water quality is not considered in their master plan (like York Region's master plan).
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	2	They do have AMP, but because they do not have a well-documented and are in the process of developing an AM strategy, the AMP is not linked to AM strategy.

Q#	Assessment Area	Question	Score	Evidence - Summary
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.	1	AMP has been developed but there is no discussion on how operation and maintenance can affect risk management.
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	3	All plans in place for watermain breaks but for sewers the plan is not as developed. They have contingency plans based on DWQMS requirements, but it is not practiced and simulated. Furthermore, management level meetings are not communicated to front line operations.
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	2	The department looks at the master plan and at lateral connections. Water mains are the drivers. Also what is the road condition like? DWQMS is followed. There is however, a disconnection in terms of ownership. You end up fixing someone else's mistake. Engineering and management need to be more integrated. Need to be sure to replace components in a logical sequence and not leave out replacements of key items during pipeline replacement, such as replacing valves. They have asset strategy which is not well documented yet.
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	2	Maintenance standard is currently being reviewed and updated. It is tied back to regulations and performance is set from this.
10	Demand Analysis	Has the organization established demand forecasting methodologies and identified plans for long term needs?	3	DWQMS - 21 elements are followed for watermains. There is no such plan for the sewers.

Q#	Assessment Area	Question	Score	Evidence - Summary
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	1	Bill Wilson, the current manager, carries out the AM role and responsibility as well as his manager's role. There is nothing documented or official.
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	3	Competency requirements are identified in job descriptions. Operators are certified. There's no linkage to AM. Training is for operations is OK.
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?	2	The department has requirements for outsourcing but there is no formal policy. The budget approval identifies the contract which will be put before council for approval. This is part of the procurement process. However, this is not tied to Asset Management. There is no systematic control procedure in place; it changes from a project to project.
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	2	The department has to ensure that the product meets the needs and it is documented. There is currently no field services manual for managing inspection of contracts. Rely on Consultant who is to confirm acquisition is ok. There is awareness but no processes have been formalized.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets,	2	There is no tracking of procedures and costs. Work order numbers are not specific. No formal document is place.

Q#	Assessment Area	Question	Score	Evidence - Summary
		during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?		
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?	1	Based on staff opinion. Opinion are formed based on the number of watermain breaks. Procedure for pump replacement needs to be developed. They do not have depreciation curves; they are using staff experience for performance modelling.
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	2	Hierarchies are captured in GIS. There is a breakdown for the water system for, for example, meters, curb boxes, sewers. However, the hierarchies have not been documented formally for all class of assets.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	2	There is no formal documentation.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data ? Has the organization identified gaps with respect to required data?	3	They felt that Level 3 best describes their current state.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	2	Data is maintained in silos. They do make use of electronic systems but these are not integrated.
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance,	2	Between 2 and 3; therefore a 2. The department conducts flow testing of hydraulics, for example. They are in the early stages of development and have no linkage to AM objectives.

Q#	Assessment Area	Question	Score	Evidence - Summary
		the extent of data to be recorded, and the frequency of collecting it?		
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	2	No formal condition assessment program is in place. They do conduct CCTV inspection of sewers.
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	3	Investigations are conducted and corrective action is taken but more on an ad hoc basis. They investigate the causes of failure for major failures only.
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?	3	There is risk assessment for the lifecycle but it is incomplete. Risk assessment approach is based on DWQMS requirements.
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	2	Based on staff opinion and not for all assets. No PoF or CoF are identified. They do not have a list of their critical assets.
26	Decision Making	Has the organization developed and implemented a method for optimized decision making?	2	No formal procedures are in place.
27	Decision Making	Is there a process to identify the long term asset renewal and rehabilitation requirements and integrate plans across service sectors?	3	Meets all requirements of 3, but not 4 because there is no risk assessment and no examination of criticality of assets. They have hydraulic models (water and sewer), capital plans are not risk based. Many decisions are political driven, balance of work in all Wards.
28	Decision Making	Has the organization integrated capital projects across all service	4	Yes there is between roads, sewer, water and parks.

Q#	Assessment Area	Question	Score	Evidence - Summary
		areas?		
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?	2	Corrosion protection of pipes, for instance was done to extend life by 20 years to cite an example but there is only a short-term schedule for non-capital projects.
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?	2	Refined processes exist but are not always followed. Some reserve funds are at the discretion of council; others are more dedicated.
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	3	Meets level 3 fully. They have reserve funds but they do not meet the need.
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?	4	They implemented PS3150 requirements. Meets level 4 fully.
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?	1	Only GIS data is organized (has standards).The organization has not considered providing data standards.
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	1	There are no data owners.
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	1	There is no formal data quality assurance process in place for asset management systems.
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	3	There is only one way communication and no formal structure. They are in the process of developing better communication plans.

Appendix E: Information Technology Sector Results

Current State Assessment Workshop Details

Workshop Date: Monday, July 18, 2016

Workshop location: Mulock Room

Table 29: Information Technology Workshop Participants

Attendee	Position/Organization	Attendee	Position/Organization
Bob Pickett	Cole Engineering	Annaliese Vollick	GIS Coordinator/Town of Newmarket
Nadeem Haque	Cole Engineering	Rob Willats	IT Client Services Coordinator/Town of Newmarket
Khurram Aziz	Yaku Consulting	Jordan Kelly	Networks & Telecommunications Coordinator
Mary-Anne Wigmore	Acting Director IT/Town of Newmarket		

Assets in the Sector

Table 30: Information Technology Assets

Class	Type - Description	Responsibility
End User Assets	Computers, laptops, printers, scanners, and etc.	IT
Network Assets	Servers, routers, and etc.	IT
Cell phones		IT
Mobiles devices		IT
AC Units		IT
Software	GIS, JD Edwards, and etc.	IT

Assessment Results

The Information Technology Sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

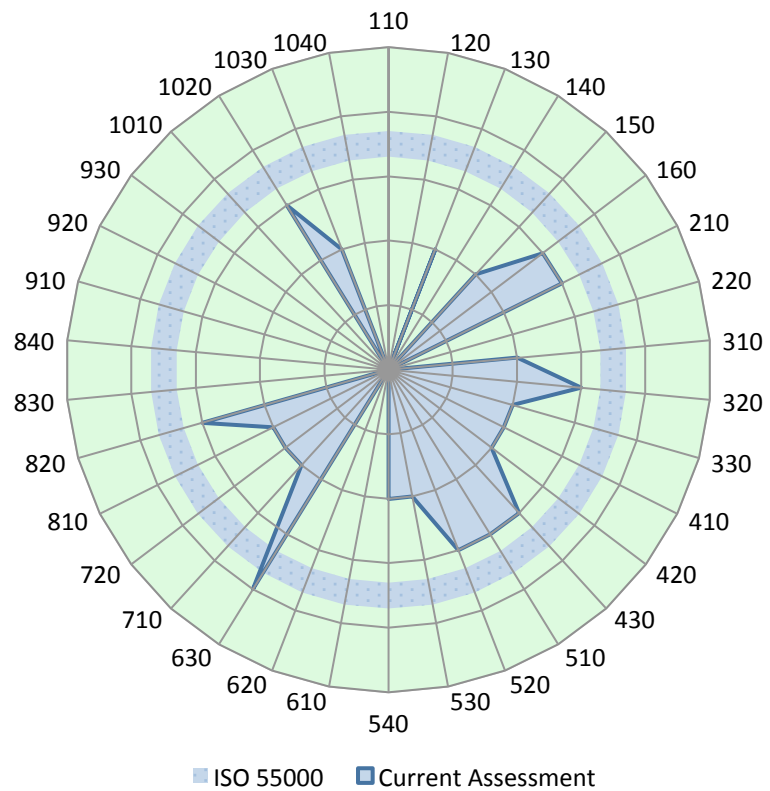
Table 31 below defines the overall AM Maturity levels for the assessment areas.

Table 31: Maturity Level of Assessment Areas - IT

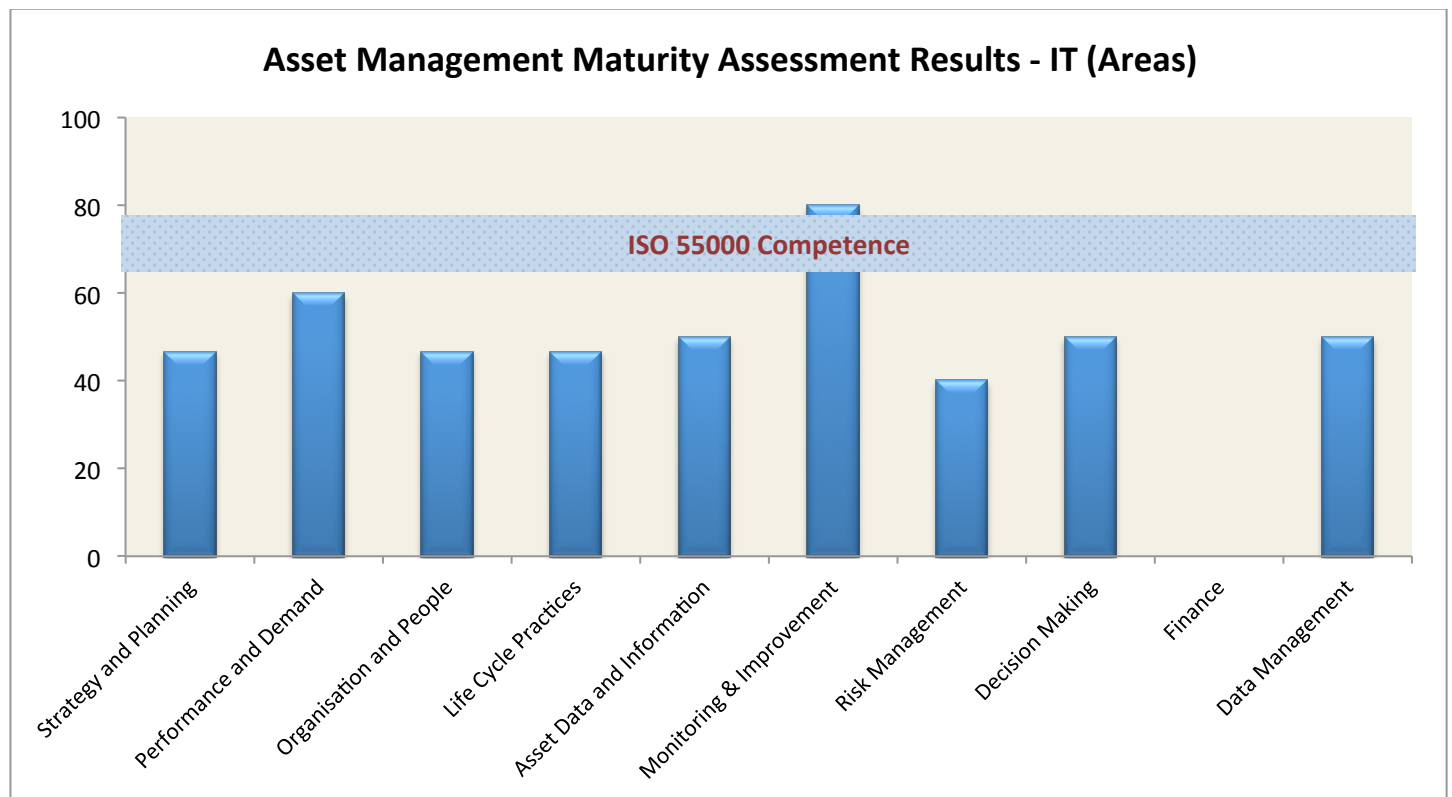
ID	Assessment Area	Score	Status
100	Strategy and Planning	47	Establishing
200	Performance and Demand	60	Developing

ID	Assessment Area	Score	Status
300	Organization and People	47	Establishing
400	Life Cycle Practices	47	Establishing
500	Asset Data and Information	50	Establishing
600	Monitoring & Improvement	80	Competence
700	Risk Management	40	Establishing
800	Decision Making	50	Establishing
900	Finance	N/A	N/A
1000	Data Management	50	Establishing
	Average Score	52	Establishing

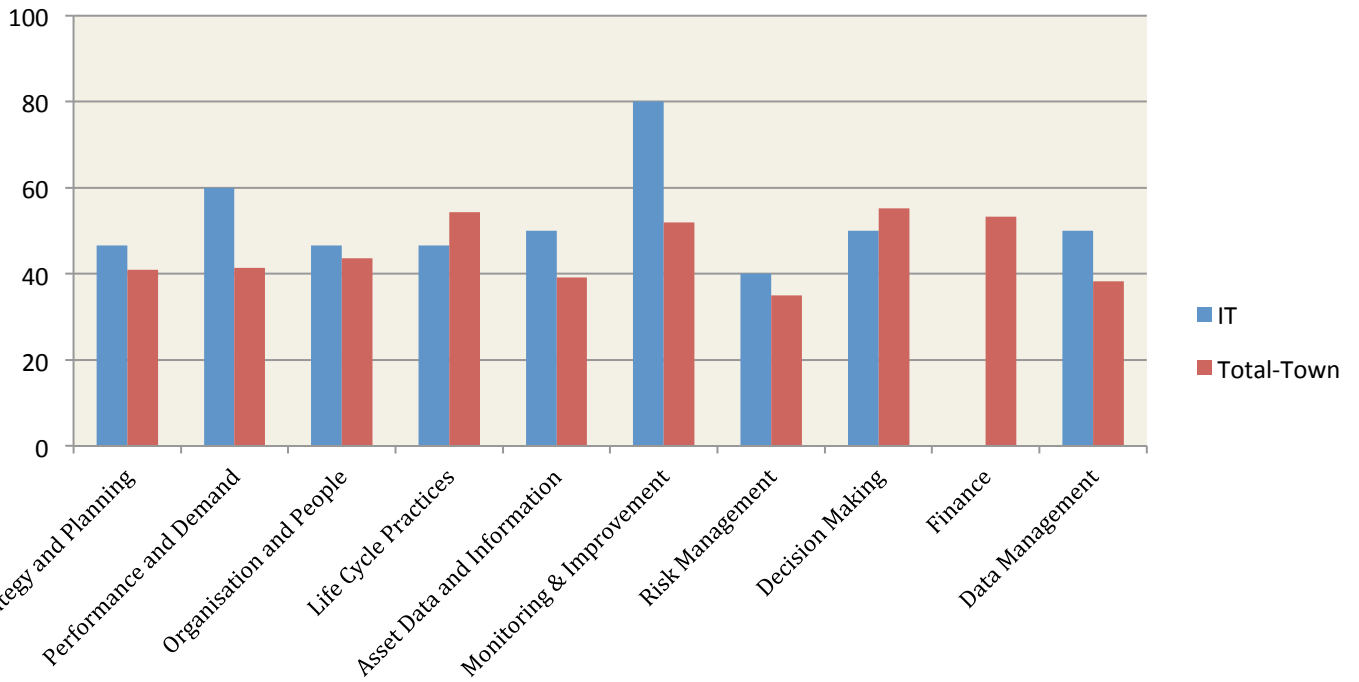
Asset Management Maturity Assessment Results - IT (Elements)



100 Strategy and Planning 110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy	200 Performance and Demand 210 LOS 220 Asset Management Strategy	300 Organization and People 310 Asset Management Structure 320 Competency 330 Outsourcing	400 Life Cycle Practices 410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling	500 Asset Data and Information 510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems
600 Monitoring & Improvement 610 Performance Assessment 620 Condition Assessment 630 Performance Improvement	700 Risk Management 710 Risk Management 720 Risk Assessment	800 Decision Making 810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects	900 Finance 910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150	1000 Decision Making 1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication



AM Maturity Comparison Chart - IT & Town



Assessment Questionnaire and Evidence

Table 32: Information Technology Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorized and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?		
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?		
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?		
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	2	IT is engaged in Master Plans, and there is awareness of the connection between master plans and AM plans but in developmental stages.
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?		
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.		

Q#	Assessment	Question	Score	Evidence - Summary
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	2	There is a plan but there is no documentation. Furthermore, it is reactive. It will take some time to develop documentation; however, phone system is the exception.
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	3	Lifecycle is documented but there is no senior staff ownership. People are aware when their computers are going to be replaced. This is documented in a spreadsheet, based usually on warranty, but the documentation is not usually kept up to date. Finance gets information itself through its purchase orders etc. However, some assets are in working order past their warranty date.
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	3	Still developing. Performance is measured.
10	Demand Analysis	Has the organization established demand-forecasting methodologies and identified plans for long term needs?		
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	2	Within department, roles and responsibilities are clearly defined for staff responsibilities, e.g. Lisa - Data, Rob - Client etc. but there is no AM Manager and roles are informal.
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	3	Meets all of Level 3 requirements. Training is on an as needed or ad hoc basis. No formal training is in place and there is no linkage to AM activities.
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant	2	Outsourcing is ad hoc and with no controls. They have spare switches in place. Warranty replacement and repair is available.

Q#	Assessment	Question	Score	Evidence - Summary
		delivery of its organizational strategic plan, and its asset management policy and strategy?		
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	2	IT goes through an RFP process but it is not linked to AM. The acquisition process is in place but the control of the asset is not.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?	2	There are no formal processes and procedures. Tracking is done through budget. Close to a 3 but processes are still informally defined.
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?	3	The lifecycle (useful life) of the assets are known - for example computers it is four years. Not all items are disposed and if they are functioning well then they are continued to be used. There is a tracking of the history of all devices. They would like to do an ongoing assessment of devices as they move forward. Warranty and support are other factors that are considered. One-third of the IT hardware is replaced every year.
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	3	Assets are tracked in Asset IT (servers, contracts etc.) through their access IDs. Keyboards are not tracked (insignificant cost). All asset hierarchies not provided but many are broken to their component level. Therefore a 3 and not 4.

Q#	Assessment	Question	Score	Evidence - Summary
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	3	Meets Level 3 because of staff information but there is no formal process.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data ? Has the organization identified gaps with respect to required data?	2	Data is collected but no gap assessment has been done. It is reactive rather than proactive.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	2	Asset IT software is not integrated - therefore there are data silos. Information is collected mainly in spreadsheets. Asset IDs are not used universally across the various systems although they could be.
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?		
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?		
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	4	Investigation of failures etc. is highly developed but not to the extent of Level 5.
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical,	2	There are no formal processes in place for risk management, though some planning is done and documented. However, the documentation is not kept up to date.

Q#	Assessment	Question	Score	Evidence - Summary
		operational, natural, external, stakeholder, life cycle)?		
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	2	There is no risk assessment process; however, a list of critical assets is kept including a breakdown to the level of applications, but there is nothing formal.
26	Decision Making	Has the organization developed and implemented a method for optimized decision making?	2	No formal processes in place
27	Decision Making	Is there a process to identify the long term asset renewal and rehabilitation requirements and integrate plans across service sectors?	3	There is a one year plan and a five year strategic plan
28	Decision Making	Has the organization integrated capital projects across all service areas?		
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?		
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?		
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?		
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?		
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?		

Q#	Assessment	Question	Score	Evidence - Summary
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	3	There are data owners but control and use of data by the owners is still under development.
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	2	There is awareness for information quality but it needs to be developed further. Periodic checks are carried out on data (e.g. for Audit by Microsoft).
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?		

Appendix F: Parks Sector Results

Current State Assessment Workshop Details

Workshop Date: Monday, July 18, 2016

Workshop location: Corporate Training Room

Table 33: Parks Workshop Participants

Attendee	Position/Organization	Attendee	Position/Organization
Bob Pickett	Cole Engineering	Doug Zweep	Culture Field Maintenance Leadhand/Town of Newmarket
Nadeem Haque	Cole Engineering	Nick Evans	General Parks and Special Events Leadhand/Town of Newmarket
Jeff Bond	acting Manager of Parks/Town of Newmarket	Scott Chambers	EAB Specialist/Town of Newmarket
Andrea Cafissi	Supervisor of Parks/Town of Newmarket	Mark Agnoletto	Senior Manager of PWS/Town of Newmarket
Dan Prendergast	Forestry Leadhand/Town of Newmarket	Mike Ashworth	Capital Projects Parks Development Coordinator/Town of Newmarket
John Dwyer	Horticulture Leadhand/Town of Newmarket	Gord MacMillan	Manager, Capital Projects/Town of Newmarket
Khurram Aziz	Yaku Consulting		

Assets in the Sector

Table 34: Parks Assets

Class	Type - Description	Responsibility
Parkland		Parks
Playgrounds		Parks
Trails		Parks
Boulevards	Right of way	Parks
Trees	30,000 trees	Parks
Woodlands		Parks

Assessment Results

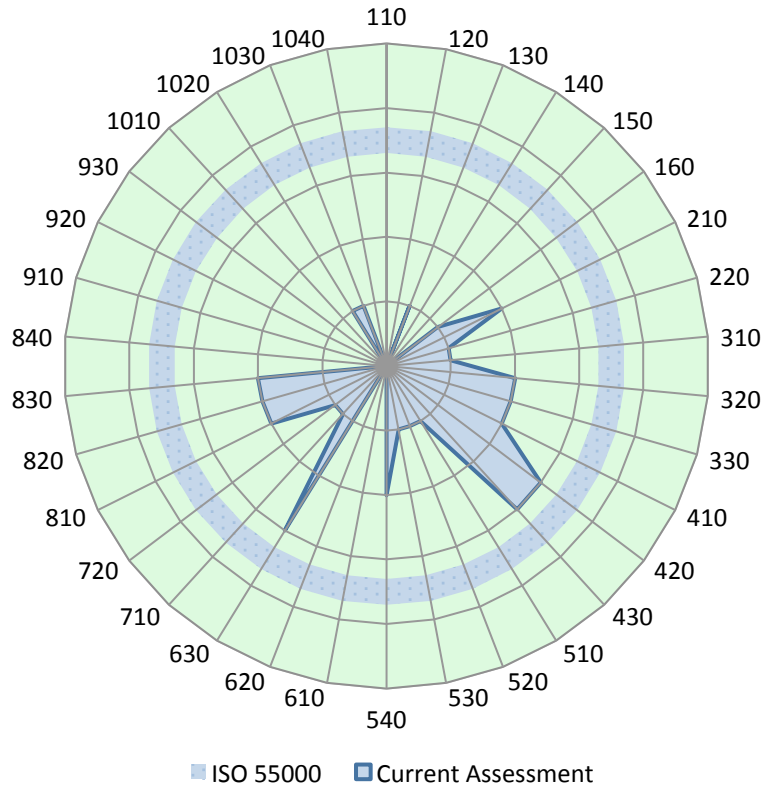
Parks sector attained an overall maturity level of “Aware” in terms of its asset management processes, procedures, and practices.

Table 35 below defines the overall AM Maturity levels for the assessment areas.

Table 35: Maturity Level of Assessment Areas – Parks

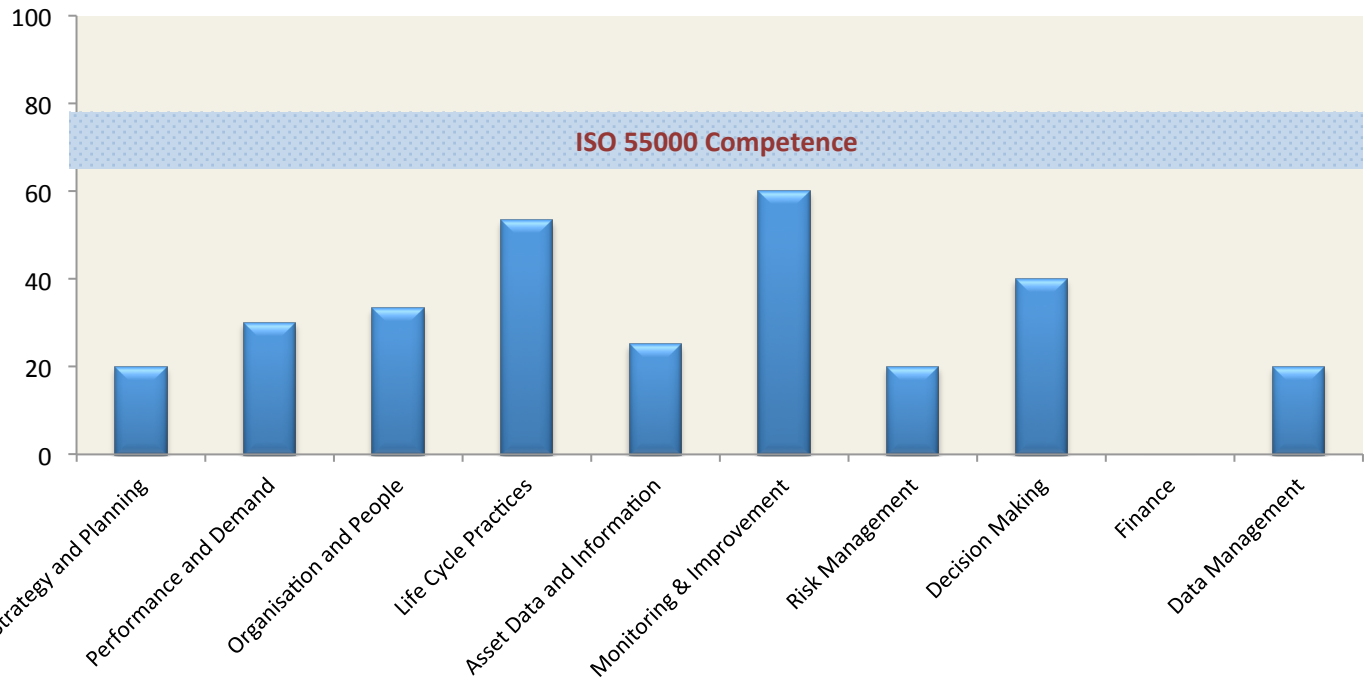
ID	Assessment Area	Score	Status
100	Strategy and Planning	20	Aware
200	Performance and Demand	30	Aware
300	Organization and People	33	Aware
400	Life Cycle Practices	53	Establishing
500	Asset Data and Information	25	Aware
600	Monitoring & Improvement	60	Developing
700	Risk Management	20	Aware
800	Decision Making	40	Establishing
900	Finance	N/A	N/A
1000	Data Management	20	Aware
	Average Score	34	Aware

Asset Management Maturity Assessment Results - Parks (Elements)

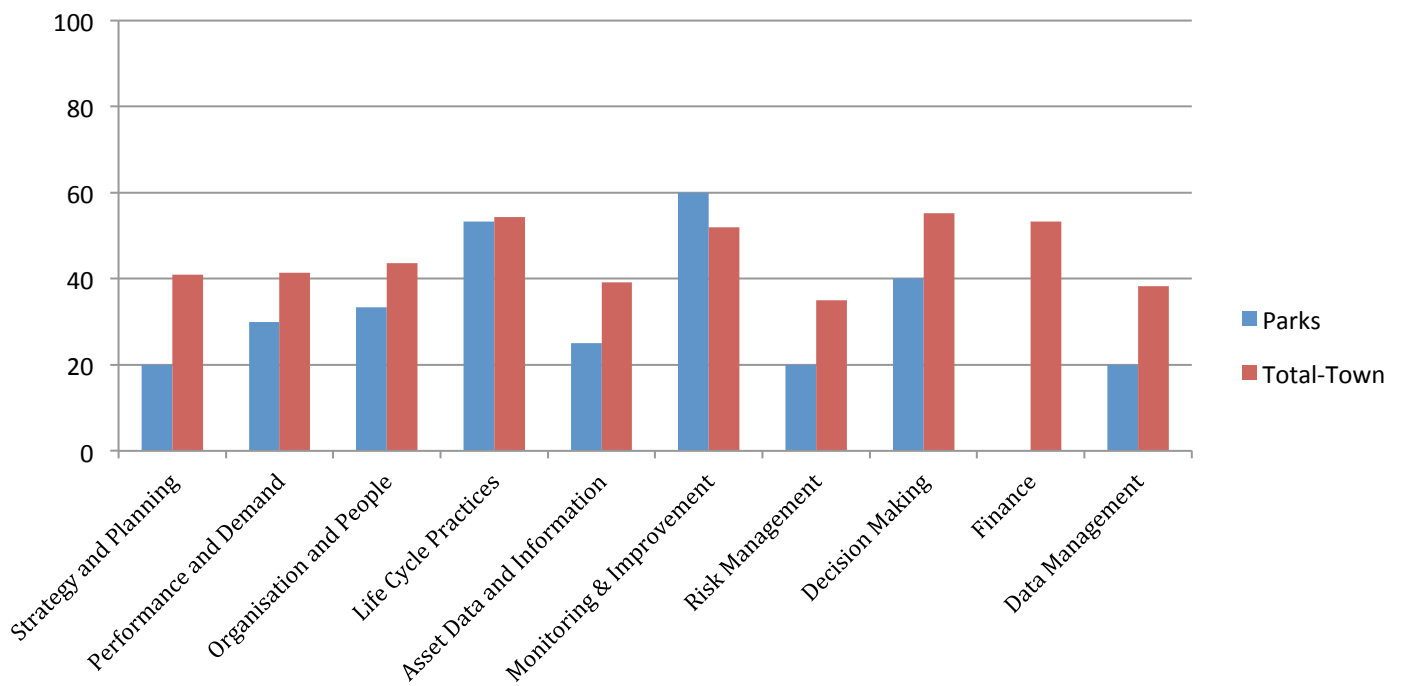


<p>100 Strategy and Planning</p> <p>110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy</p>	<p>200 Performance and Demand</p> <p>210 LOS 220 Asset Management Strategy</p>	<p>300 Organization and People</p> <p>310 Asset Management Structure 320 Competency 330 Outsourcing</p>	<p>400 Life Cycle Practices</p> <p>410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling</p>	<p>500 Asset Data and Information</p> <p>510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems</p>
<p>600 Monitoring & Improvement</p> <p>610 Performance Assessment 620 Condition Assessment 630 Performance Improvement</p>	<p>700 Risk Management</p> <p>710 Risk Management 720 Risk Assessment</p>	<p>800 Decision Making</p> <p>810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects</p>	<p>900 Finance</p> <p>910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150</p>	<p>1000 Decision Making</p> <p>1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication</p>

Asset Management Maturity Assessment Results - Parks (Areas)



AM Maturity Comparison Chart - Parks & Town



Assessment Questionnaire and Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?		
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?		
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?		
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	1	There is no formal plan; recreation department dictates development. Planning is fragmented. Recreation determines what is to be built and Engineering will manage the design and construction. They don't have a master plan but have what they called a recreational "play book".
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?		

Q#	Assessment Area	Question	Score	Evidence - Summary
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.		
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?		
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	1	There is no formal strategy.
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	2	Meets level 2 fully. Technical performance is measured and reported but not to level 3 where risks and costs have been determined. Service levels exist, but the link between cost and LOS is missing. Customer survey developed by Town with few questions related to park and what questions that are asked have no input from parks.
10	Demand Analysis	Has the organization established demand forecasting methodologies and identified plans for long term needs?	1	Demand is development driven. Forecasting is done on very informal basis and not tied with long term planning. Development charge study is conducted every 5 years to take into account demand

Q#	Assessment Area	Question	Score	Evidence - Summary
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	1	There is no AM staff or roles.
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	2	Competency is addressed in a very minimal way. They have horticulture and arborist specialists.
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?	2	Outsourcing is done for road needs studies, bridge inspections, parking lot assessments, building condition assessments and Arborists but is on an ad hoc basis.
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	2	There is awareness only.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware	3	O & M costs are still mixed in many cases (so it is not a 4). A master plan is followed that determines monthly schedule of activities.

Q#	Assessment Area	Question	Score	Evidence - Summary
		of O&M cost of its assets?		
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?	3	Although useful lives have been determined there are no deterioration curves.
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	1	Hierarchies have not been created for the assets at the lower level.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	1	No work has been done on this and no records have been made. Most of the data needs are not identified.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data ? Has the organization identified gaps with respect to required data?	1	There is no consistency in recording and no formal system. For example, tree inventory exists but is not up to date.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	2	Meets Level 2 fully - information is collected but it is in silos; not integrated or complete.

Q#	Assessment Area	Question	Score	Evidence - Summary
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?		
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?		
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	3	Still developing but in Level 3.
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?	1	Risk a management is not conducted so it is Level 1.
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	1	PoF and CoF are not determined.

Q#	Assessment Area	Question	Score	Evidence - Summary
26	Decision Making	Has the organization developed and implemented a method for optimized decision making?	2	No formal processes are in place. Based on staff discussions and inspections..
27	Decision Making	Is there a process to identify the long-term asset renewal and rehabilitation requirements and integrate plans across service sectors?	2	Have a one-year plan done, but three years plan not done. Only playgrounds are in the replacement plans
28	Decision Making	Has the organization integrated capital projects across all service areas?	2	There is linkage among some capital plans of different service areas, but no formal integration exists. It is being done in a more intuitive way than as a process.
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?		
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?		
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?		

Q#	Assessment Area	Question	Score	Evidence - Summary
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?		
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?		
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	1	There are no data owners.
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	1	No quality assurance exists for any of the data.
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?		

Appendix G: Facilities Sector Results

Current State Assessment Workshop Details

Workshop Date: Monday 8 August 2016

Workshop location: Corporate Training Room

Workshop participants:

Table 36: Facilities workshop participants

Attendee	Position/Organization	Attendee	Position/Organization
Harry Vanwensem	Manager of Facilities / Town	Lisa Ellis	Business Performance Coordinator / Town
Scott Bond	Supervisor of Facility MTC / Town	Dean Rurak	Yaku Consulting
Michael Wilson	Supervisor of Facility Operations / Town	Amir Ebrahimi	Yaku Consulting
Jason Emo	Supervisor of Facility Operations / Town	Khurram Aziz	Yaku Consulting
Ryan Gamna	Facility Lead Hand / Town		

Assets in the Sector

Table 37: Facilities Assets

Class	Type - Description	Responsibility
Infrastructure	Fire Stations	Facilities
	Library	Facilities
	Operations centre	Facilities
	Administrative offices	Facilities
	Parks buildings (e.g. toilets, storages)	Facilities
	Recreation Centres	Facilities
	Senior Centre	Facilities
	Museum	Facilities
	Arts and Culture Centre	Facilities
	Bar and Restaurant	Facilities
	Residential Houses	Facilities
	Pumping Stations	Facilities

Asset lifecycle activity management

Other than as indicated in the table above, facilities group relies on following for assistance with major lifecycle activities, or provides the following additional services:

- IX. Building Condition Assessment is outsourced

X. Clearing is delivered through contractors

Assessment Results

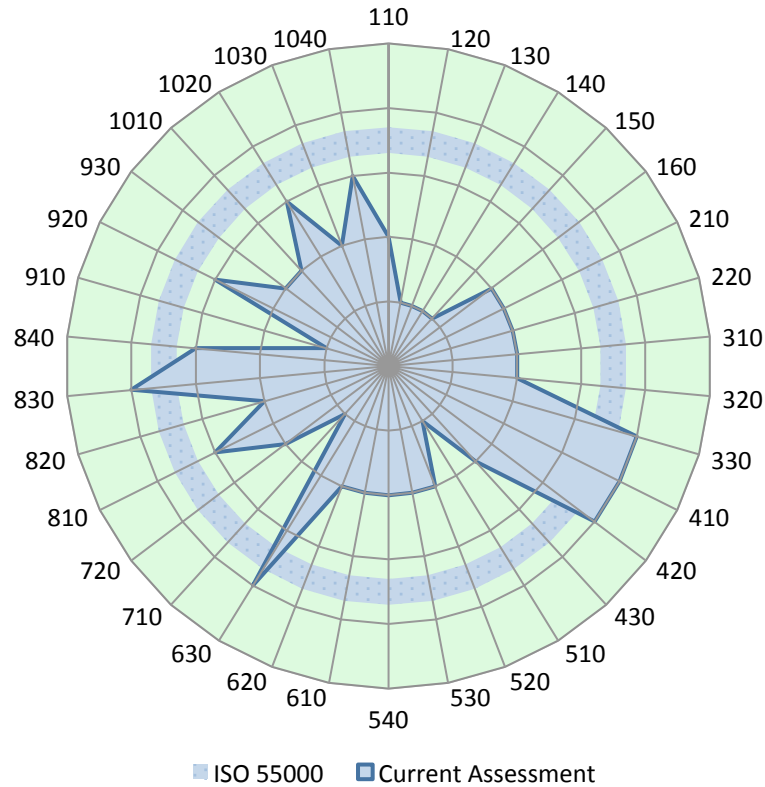
Facilities sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 38 below defines the overall AM Maturity levels for the assessment areas.

Table 38: Maturity Level of Assessment Areas – Facilities Sector

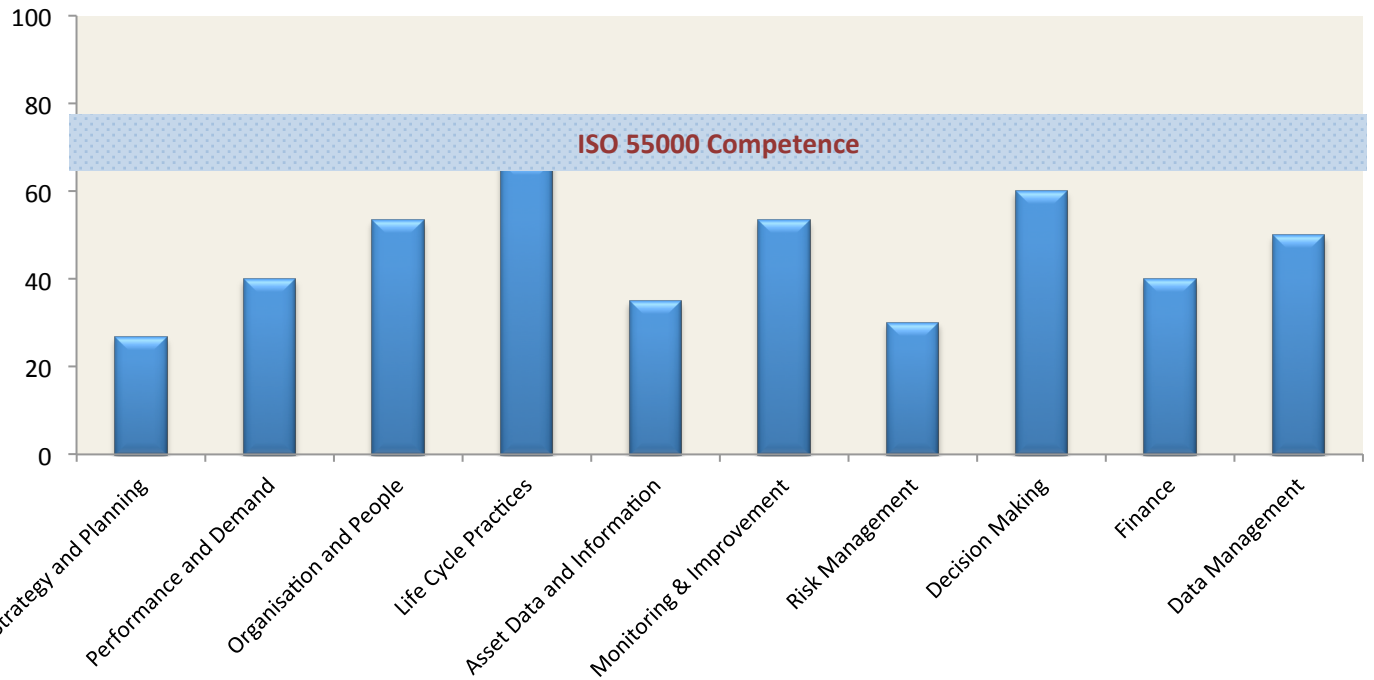
ID	Assessment Area	Score	Status
100	Strategy and Planning	27	Aware
200	Performance and Demand	40	Establishing
300	Organization and People	53	Establishing
400	Life Cycle Practices	67	Developing
500	Asset Data and Information	35	Aware
600	Monitoring & Improvement	53	Establishing
700	Risk Management	30	Aware
800	Decision Making	60	Developing
900	Finance	40	Establishing
1000	Data Management	50	Establishing
	Average Score	46	Establishing

Asset Management Maturity Assessment Results – Facilities (Elements)

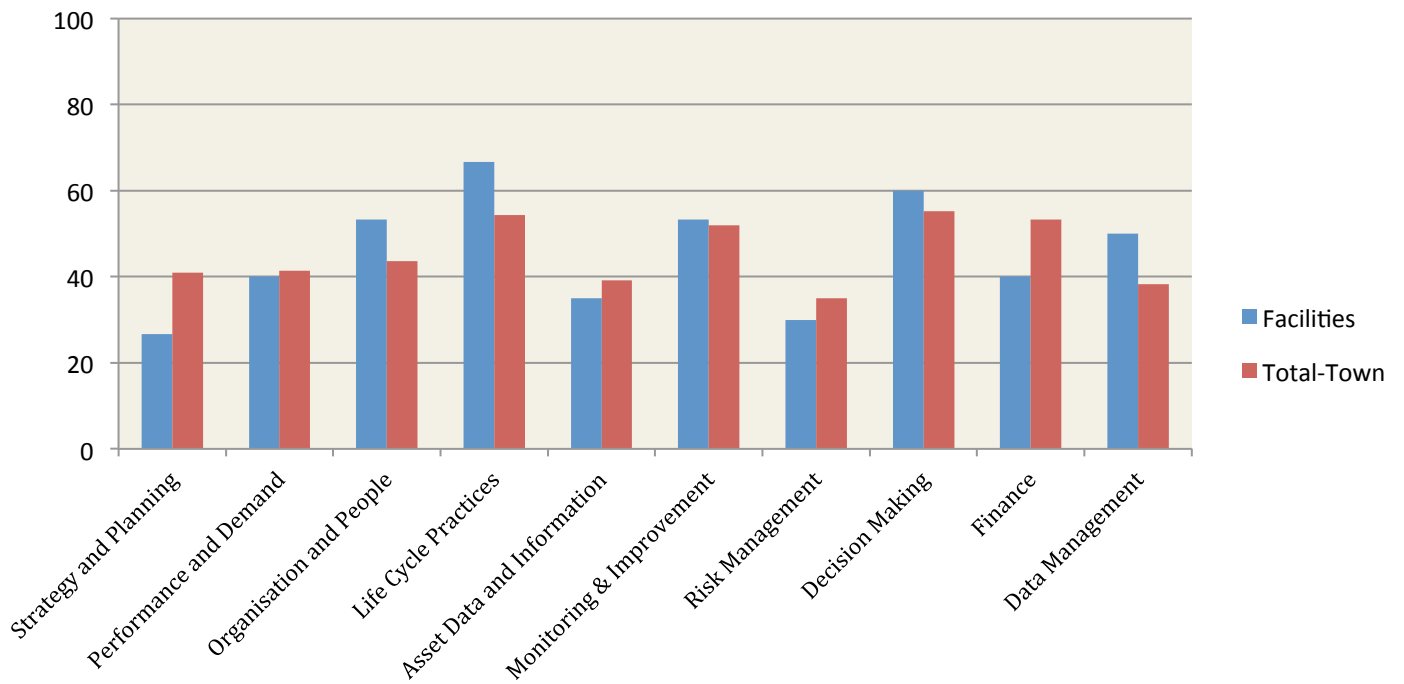


<p>100 Strategy and Planning</p> <ul style="list-style-type: none"> 110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy 	<p>200 Performance and Demand</p> <ul style="list-style-type: none"> 210 LOS 220 Asset Management Strategy 	<p>300 Organization and People</p> <ul style="list-style-type: none"> 310 Asset Management Structure 320 Competency 330 Outsourcing 	<p>400 Life Cycle Practices</p> <ul style="list-style-type: none"> 410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling 	<p>500 Asset Data and Information</p> <ul style="list-style-type: none"> 510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems
<p>600 Monitoring & Improvement</p> <ul style="list-style-type: none"> 610 Performance Assessment 620 Condition Assessment 630 Performance Improvement 	<p>700 Risk Management</p> <ul style="list-style-type: none"> 710 Risk Management 720 Risk Assessment 	<p>800 Decision Making</p> <ul style="list-style-type: none"> 810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects 	<p>900 Finance</p> <ul style="list-style-type: none"> 910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150 	<p>1000 Decision Making</p> <ul style="list-style-type: none"> 1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication

Asset Management Maturity Assessment Results – Facilities (Areas)



AM Maturity Comparison Chart - Facilities & Town



Assessment Questionnaire and Evidence

Table 39: Facilities Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?	2	Participants were not fully aware that there is an asset management plan in place.
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?	1	There is not an AM Strategy in place.
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?	1	There is not an AM Strategy in place.
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	1	There is not a formal Mater Plan in place. There was a list of assets with 10-year replacement schedule in place, but it is not used anymore.
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	1	There is not a formal AMP in place. Capital request are based on Building Condition Assessment, Useful life and feedback from consultants. Some aspects of AMP are in place.
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be	1	There is not a formal AMP in place.

Q#	Assessment Area	Question	Score	Evidence - Summary
		managed.		
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	1	No formal and documented contingency plan in place.
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	2	They are doing renewal and replacement, but it is mostly based on age.
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	2	The expectations are known based on expert opinions and customer complaints. There are response to complaints but not documented. Regulatory requirement (e.g. accessibility, AODA, TSSA, etc.) are determined and considered for many of assets.
10	Demand Analysis	Has the organization established demand forecasting methodologies and identified plans for long term needs?	2	It is based on staff experience, but not fully documented. A 15 year requirement forecast is provided.
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	2	At some point in the past information was developed but it was never formally adopted and it was not kept up-to-date. ..
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	2	The HR hiring process is in place, requirements (e.g. health & safety) are determined. Job descriptions are determined. Training budget is determined and some training is in place. It is not asset management related.

Q#	Assessment Area	Question	Score	Evidence - Summary
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?	4	For BCA, requirements are clearly determined and controls are in place. For cleaning, requirements are determined and facilities supervisor will control that. Also there is complaint system that will be followed with supervisor to make sure it is solved. Consultant performance evaluation for upcoming contracts will be completed based on contractors' performance and sent to procurement.
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	4	For fleet (e.g. Zamboni) standards are identified and sources are evaluated to meet the standards. For major building items (e.g. roof and HVAC) standards are in place. Major and large projects are managed by engineering services, and on recent projects O&M teams were involved.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?	4	O&M procedures are determined and implemented. Work orders can be tracked for each asset (e.g. HVAC, refrigerator). It is via JDE.. Noted this was not at the individual asset level.
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been determined? Is there a deterioration curve in place?	2	Useful life is determined based on industry standards. Deterioration curves are not developed, but may have for a number of assets (e.g. heating)

Q#	Assessment Area	Question	Score	Evidence - Summary
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	1	Asset hierarchies are prepared at high level (facility level) but not at system, individual asset or component level.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	2	A clear list of required data is not documented.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data? Has the organization identified gaps with respect to required data?	2	Asset inventory with assets relationships was provided 10 years ago but is not updated from that time.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	2	Some assets data are stored in excel worksheets. Operating budget is in JDE. Staff uses reports from JDE converted to excel.
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?	2	Performance is not assessed systematically. Customer satisfaction is measured through customer surveys and complaints.
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	2	Building Condition Assessment is just now in place. It is a 4 scales assessment. It is currently started with older properties. Frequency for roof is determined (5 years) but whole building is not determined, as they are not complete through the first assessment cycle

Q#	Assessment Area	Question	Score	Evidence - Summary
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	4	Reactive and proactive actions based on performance results are in place.
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?	1	Believed something is in place but unclear on the details or where it is from
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	2	Critical assets are understood informally based on staff knowledge, They have not formally been recognised or documented.
26	Decision Making	Has the organization developed and implemented a method for optimized decision-making?	3	Decision making process is implemented but not fully documented. BCA consideration and sensitivity analysis are in place. There is no formal risk assessment in place and so risk based decision-making is not developed yet.
27	Decision Making	Is there a process to identify the long term asset renewal and rehabilitation requirements and integrate plans across service sectors?	2	There is a capital plan in place.
28	Decision Making	Has the organization integrated capital projects across all service areas?	4	Capital plans are integrated between different business units. All capitals go for discussions and review together and after they are combined.
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?	3	10 years non-capital projects (repairs and maintenances) are provided for major equipment. It is more based on budget than equipment requirements.

Q#	Assessment Area	Question	Score	Evidence - Summary
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?	1	No zero-based budgeting is in place. Budget typically is determined from last year budget with some modifications.
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	3	Small reserves are in place, but based on participant knowledge required reserve funds are not determined. There is lack of communication between operational staff and finance staff.. Note the score from Finance was checked and this to 3 from original 2.
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?	2	Facilities group are unaware of PC3150 reporting, so score of 2 was selected since it is known the Town is in compliance with TCA reporting requirements.
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?	2	No data standard is in place
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	3	Service manager is data owner and is responsible for updating data. This is not determined in the job description.
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	2	No formal data quality assessment is in place. Data are not updated periodically
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	3	Communication is in place, and it is mainly one way. Good example is communications for budget request. They started to determine pertinent information.

Appendix H: Fleet Sector Results

Current State Assessment Workshop Details

Workshop Date: Thursday 14 July 2016

Workshop location: Corporate Training Room

Table 40: Fleet workshop participants

Attendee	Position/Organization	Attendee	Position/Organization
John Hoover	Fleet	Dean Rurak	Yaku Consulting
Connor Wilson	Fleet	Amir Ebrahimi	Yaku Consulting
Lisa Ellis	Business Performance Coordinator	Khurram Aziz	Yaku Consulting
		Alan Pressman	Yaku Consulting

Assets in the Sector

Table 41: Fleet Assets

Class	Type	Responsibility
Fire Vehicles	Light Duty Truck	Fire & Fleet
	Aerial, Pumper, Tanker, Rescue Truck	Fire & Fleet
	Trailer	Fire & Fleet
Non-Fire Vehicles	Passenger Vehicle	Fire & Fleet
	Passenger Vehicle	Related Section & Fleet
	Van	Related Section & Fleet
	Light Duty Truck	Related Section & Fleet
	Heavy Duty Truck	Related Section & Fleet
	Trailer	Related Section & Fleet
Equipment		Fleet
Spare part		Fleet

Asset lifecycle activity management

Other than as indicated in the table above, fleet group relies on following for assistance with major lifecycle activities, or provides the following additional services:

- XI. Fleet group does not equipped with AC test equipment, and so AC test is outsourced
- XII. When work load is high some maintenance and repair activities are outsourced

Assessment Results

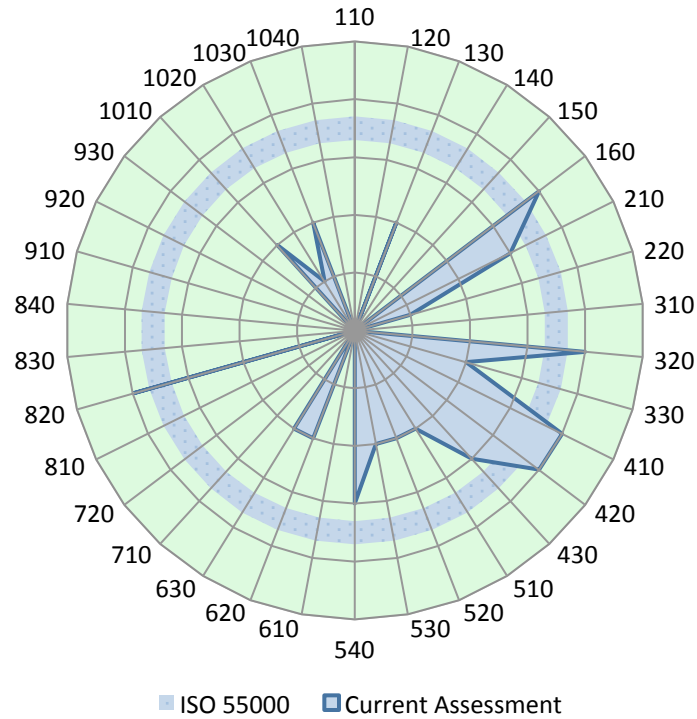
Fleet sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 42 below defines the overall AM Maturity levels for the assessment areas.

Table 42: Maturity Level of Assessment Areas – Fleet Sector

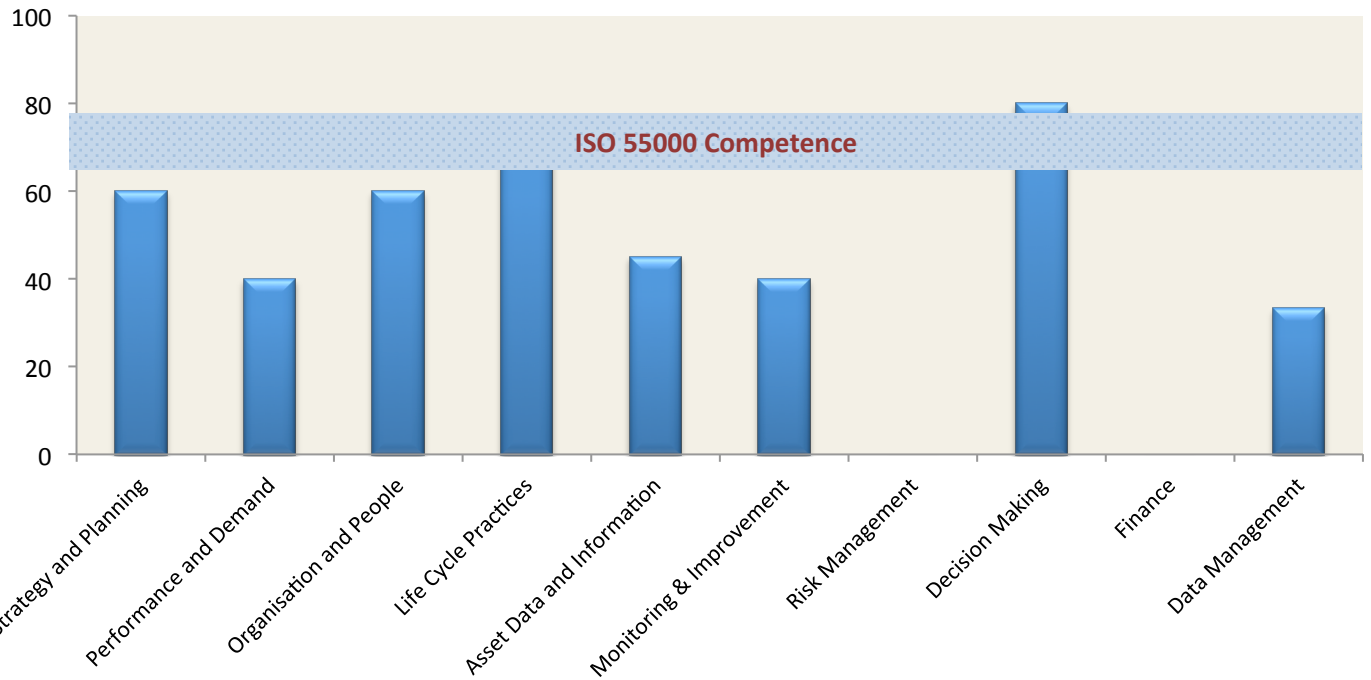
ID	Assessment Area	Score	Status
100	Strategy and Planning	60	Developing
200	Performance and Demand	40	Establishing
300	Organization and People	60	Developing
400	Life Cycle Practices	73	Developing
500	Asset Data and Information	45	Establishing
600	Monitoring & Improvement	40	Establishing
700	Risk Management	NA	---
800	Decision Making	80	Competence
900	Finance	NA	---
1000	Data Management	33	Aware
	Average Score	54	Establishing

Asset Management Maturity Assessment Results – Fleet (Elements)

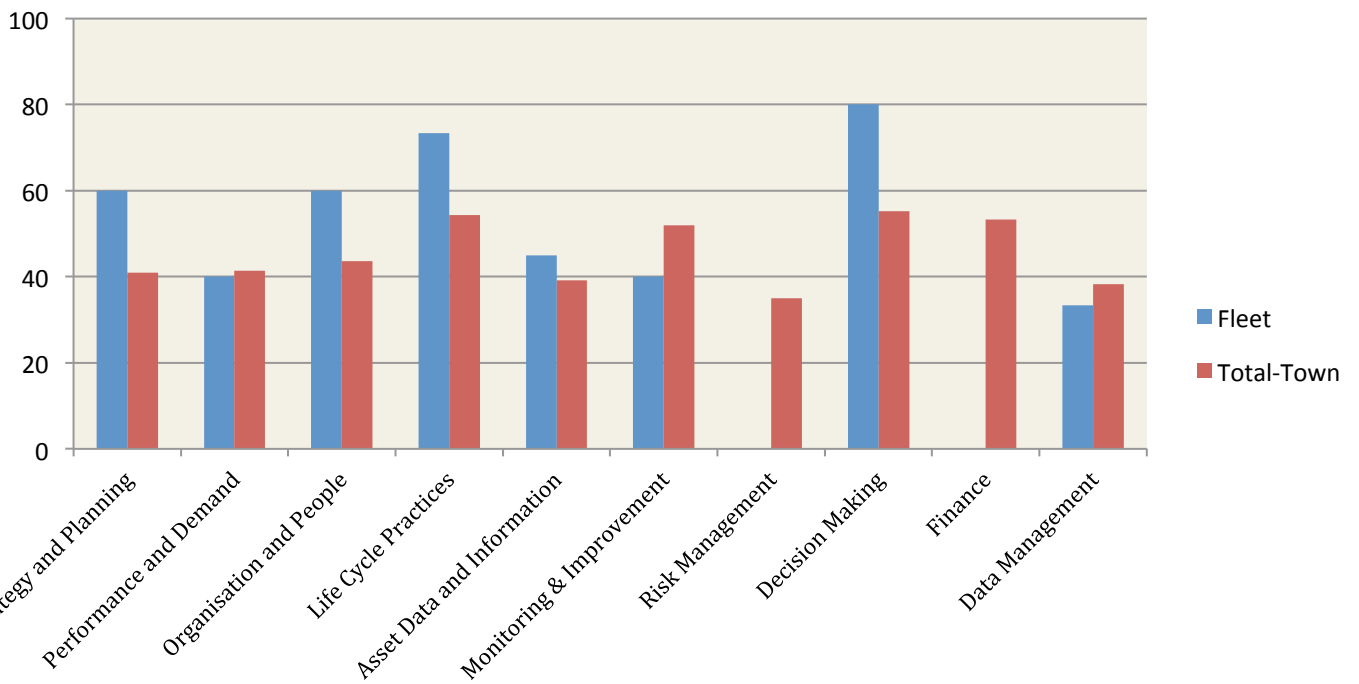


100 Strategy and Planning 110 Asset Management Policy 120 Asset Management Strategy 130 Master Plan 140 Asset Management Plan 150 Contingency Planning 160 Asset Strategy	200 Performance and Demand 210 LOS 220 Asset Management Strategy	300 Organization and People 310 Asset Management Structure 320 Competency 330 Outsourcing	400 Life Cycle Practices 410 Acquisition 420 Operations & Maintenance (O&M) 430 Performance Modelling	500 Asset Data and Information 510 Asset Hierarchy 520 Asset Management Data 530 Asset Management Data Availability 540 Information Systems
600 Monitoring & Improvement 610 Performance Assessment 620 Condition Assessment 630 Performance Improvement	700 Risk Management 710 Risk Management 720 Risk Assessment	800 Decision Making 810 Optimized Decision Making 820 Capital Plans 830 Capital Projects Integration 840 Non-Capital Projects	900 Finance 910 Financial and Funding Strategy 920 Reserve Fund 930 PS3150	1000 Decision Making 1010 Data Standards 1020 Data Owner 1030 Information Quality 1040 Communication

Asset Management Maturity Assessment Results – Fleet (Areas)



AM Maturity Comparison Chart - Fleet & Town



Assessment Questionnaire and Evidence

Table 43: Fleet Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?	NA	Not Applicable
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?	NA	Not Applicable
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?	NA	Not Applicable
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	2	<p>A formal master planning document is not available.</p> <p>Planning is mostly based on staff opinion and knowledge, as there is no documented process in place.</p> <p>Needs are determined by the staff based on the condition of fleet assets and forwarded to departments managers through appropriate forms. Decisions are based on budget considerations.</p> <p>Town of Newmarket Fleet Audit document is available. This document has not yet been adopted by the council. It basically lists the practice followed by the staff, and the document is unofficially followed.</p>

Q#	Assessment Area	Question	Score	Evidence - Summary
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	NA	Not Applicable
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.	NA	Not Applicable
7	Strategy and Planning	Has the organization provided plan(s) and procedure(s) for identifying and responding to incidents and emergency situations and ensuring continuity of critical asset management activities?	NA	Not Applicable
8	Strategy and Planning	Has the organization identified asset strategy for R&R projects (e.g. shave and pave strategy for road)? Does it include determining benefit and cost of implementing the asset strategy?	4	<p>Dry service, full service and annual safety inspections are in place. Annual inspections carried out through certified stations. Service needs are determined based on the type of vehicle, and the departments' needs (e.g. Fire department has 11 trucks and requires that 6 trucks be in service at all times for its 6 crews).</p> <p>Maintenance, services (i.e. oil change) and part replacement are based on time and/or mileage. The process is based on considering departments' needs (i.e. planned service and inspection so many vehicles do not come in for service at the same time). A weekly mileage report is generated. The process is fully documented and scheduled.</p> <p>(Note: The fleet service area is undergoing a review nowadays)</p>

Q#	Assessment Area	Question	Score	Evidence - Summary
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	3	Commercial Vehicle Operators Safety Manual (CVOR book) available. Service currently implemented through emails, however, Fire department is working on using the Firehouse system instead of emails. LOS in general have been identified but not integrated with time and maintenance schedule. Specific LOS measures such as response time are not in place. Safety stock for parts is not linked to LOS. Formal documentation is not in place.
10	Demand Analysis	Has the organization established demand forecasting methodologies and identified plans for long term needs?	1	A documented demand forecasting process is not in place. Needs are mainly identified through discussions between fleet supervisor and department supervisors. Decisions are subjective and are made on an ad-hoc basis. These decisions mainly pertain to the response of a current problem, and not to estimated future demand.
11	Organization and People	Is there an established appropriate governance framework to support the management of assets including defined roles and responsibilities, appointing AM manager, providing sufficient resources, acceptance by senior management, and elected officials of the importance of asset management?	NA	Not Applicable
12	Organization and People	Does the organization identify competency requirements? Does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	4	All staffs have basic required licences. Some staffs have advanced inspection and maintenance licences. These include Ozone depletion license, propane license, trucking coach license, automotive and heavy equipment license, Emergency Vehicle Technician (EVT) certification. Competency and licensing requirements are provided in job description. The Town provides some training to staff on a requirement basis. The Town has an annual personal

Q#	Assessment Area	Question	Score	Evidence - Summary
				improvement plan in place where staffs identify their training needs in consultation with their supervisors.
13	Organization and People	Where the organization has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organizational strategic plan, and its asset management policy and strategy?	2	No formal process is in place or documented. Staff often checks the work completed by the consultant, however, this is done on an ad-hoc basis.
14	Life Cycle Practices	Has the organization established, implemented and maintains processes for the creation (e.g. design), acquisition or enhancement of assets so they are carried out under specified condition and aligned with asset management strategies? E.g. design, modification, procurement, construction and commissioning activities.	4	Specifications are determined and pre inspections are in place. New vehicles are inspected to determine if the requirements have been met. Note: Sometimes, the recommendations by staff are disregarded during the acquisition process.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?	4	O&M cost for each asset worth over \$5000 can be tracked through JDE. Equipment with less worth is not tracked individually but pooled together. Maintenance program and procedure, with their frequency is developed and documented. Staffs are aware of the procedure.
16	Life Cycle Practices	How does the organization model the performance of its assets over their life? E.g. has useful life been	3	Useful lives of assets are determined, however, trade-in value of vehicles is also factored in by the staff when

Q#	Assessment Area	Question	Score	Evidence - Summary
		determined? Is there a deterioration curve in place?		determining end-of-life for vehicles. In response to the audit, plans to monitor condition are being developed. Downtime and backup are also being considered.
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	2	Asset hierarchy is provided at a high level. Assets are divided into four major categories - heavy equipment, general equipment, light vehicles and heavy vehicles. Further sub-categories are defined for Fire trucks; however, no further break down for other assets is available.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	2	Only the data needed is collected. Required data is not formally determined.
19	Asset Data and Information	Has the organization collected and recorded asset management data including; physical asset data (e.g. description, location, size), valuation data, maintenance data, condition data, performance data, risk data? Has the organization identified gaps with respect to required data?	2	Mileage, hours of operation, VIN numbers etc. were previously entered in JDEdwards; however, this is not maintained anymore. Staff noted that details were too onerous to be kept, therefore, not collected. Mileage can be tracked from latest work orders. Maintenance histories are available. Accessibility is low.
20	Asset Data and Information	Has the organization integrated its information systems (e.g. asset register system, maintenance system, financial system) to support the asset management activities?	3	JDE is used for Financial and O&M data. The Town is currently evaluating various options for their data requirement needs in addition to the JDE system. Current data is not well integrated. Work orders can be tracked through JDE; however, mileage is not trackable and searchable. The Town has initiated a pilot project with Infomax in which a Magic pen is used to for work order data entry on a special purpose paper and the collected data is uploaded to its cloud platform when the pen is docked.

Q#	Assessment Area	Question	Score	Evidence - Summary
21	Monitoring & Improvement	Does the organization measure the performance of its asset and asset management system (e.g. availability, health and safety, customer satisfaction)? Has the organization determined parameters for monitoring asset performance, the extent of data to be recorded, and the frequency of collecting it?	NA	Not Applicable
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	2	Condition assessment process is in place and done through visual inspection and staff opinion. Condition is recorded and stored in JDE for each vehicle on a 4 scale system (Poor, Fair, Good and Excellent). No guideline is currently in place for making the inspection more robust. (Note: This element is assessed as a level 2, however, it could be assessed as a level 3)
23	Monitoring & Improvement	Does the organization investigate failures, incidents and nonconformities associated with assets, asset systems and the asset management system?	2	No formal root cause analysis in process. Discussions revealed that there is a considerable variety of fleet available, and the staff often don't run into the same problem (repeated failures seldom occur), hence they do not see a need for formal root cause analysis.
24	Risk Management	Are there documented process and/or procedure for the identification and assessment of asset and asset management related risks throughout the asset life cycle? Does the risk process cover various types of risk within its risk assessments? (E.g. physical, operational, natural, external, stakeholder, life cycle)?	NA	Not Applicable
25	Risk Management	Does the organization identify Failure Modes, Probability of Failure (PoF), and Consequence of Failure (CoF) for its existing assets? Does the organization provide a clear list of critical assets available?	NA	Not Applicable

Q#	Assessment Area	Question	Score	Evidence - Summary
26	Decision Making	Has the organization developed and implemented a method for optimized decision making?	NA	Not Applicable
27	Decision Making	Is there a process to identify the long term asset renewal and rehabilitation requirements and integrate plans across service sectors?	4	Capital plan is in place for fleet itself.
28	Decision Making	Has the organization integrated capital projects across all service areas?	NA	Not Applicable
29	Decision Making	Is there a process to identify non capital projects (e.g. major maintenance projects)?	NA	Not Applicable
30	Finance	Is there documented processes and/or procedures for the financial planning? Has the organization determined funding strategy (e.g. rate study, tax)? Has the organization developed procedures in terms of funding constraints?	NA	Not Applicable
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	NA	Not Applicable
32	Finance	Are there policies and procedures established to reconcile asset acquisition and renewal Financial Records with the accounting record (e.g. TCA policy)?	NA	Not Applicable
33	Data Management	Is there documentation and standards established to describe for the main elements of the asset management system and interactions between them?	2	Data standards for each field that is recorded through the magic pen (pilot project) in JDE are available. (Note: Winfield does not integrate with JDE)

Q#	Assessment Area	Question	Score	Evidence - Summary
34	Data Management	Has the organization determined and appointed data owners to be responsible for ensuring effective control and use of data?	1	Data owner is not officially identified. (* Note that quality checks are implemented and work order data is examined on a monthly basis to determine incomplete entries. Valerie is the administrative assistant for fleet, responsible for this)
35	Data Management	Does the organization maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	2	Quality checks are in place on a monthly schedule, to determine missing data. Process is in place to add new assets in the system and also mark the status of decommissioned assets in the system as disposed. This process is separately by finance in finance registry and by Valerie in asset registry in JDE.
36	Data Management	How does the organization ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	NA	Not Applicable

Appendix I: Central York Fires Services Sector Results

Current State Assessment Workshop Details

Workshop Date: Monday 8 August 2016

Workshop location: Planning Room

Workshop participants:

Table 44: Central York Fires Services workshop participants

Attendee	Position/Organization	Attendee	Position/Organization
Ian Laing	Fire Chief / Fire Services	Dean Rurak	Yaku Consulting
Lisa Ellis	Business Performance Coordinator / Town	Amir Ebrahimi	Yaku Consulting

Assets in the Sector

Table 45: Central York Fires Services Assets

Class	Type	Responsibility
Infrastructure	Fire Station (4 stations, 2 in Newmarket, 2 in Aurora)	Facilities???
	Training Centre	Facilities???
Fleet	Fire Trucks (e.g. Aerial, Pumper, Rescue Truck)	Fire & Fleet
	Light Duty Vehicles	Fire & Fleet
Equipment	Vehicle Extrication Equipment (e.g. hydraulic spreader)	Fire Services???
	Firefighting Equipment (e.g. axe, halligan bar)	Fire Services
	Medical Equipment (e.g. oxygen, basic trauma kit)	Fire Services
	Personal Protective Equipment	Fire Services

Asset lifecycle activity management

Other than as indicated in the table above, facility group relies on following for assistance with major lifecycle activities, or provides the following additional services:

Assessment Results

Central York fires services sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 46 below defines the overall asset management maturity levels for the assessment elements.

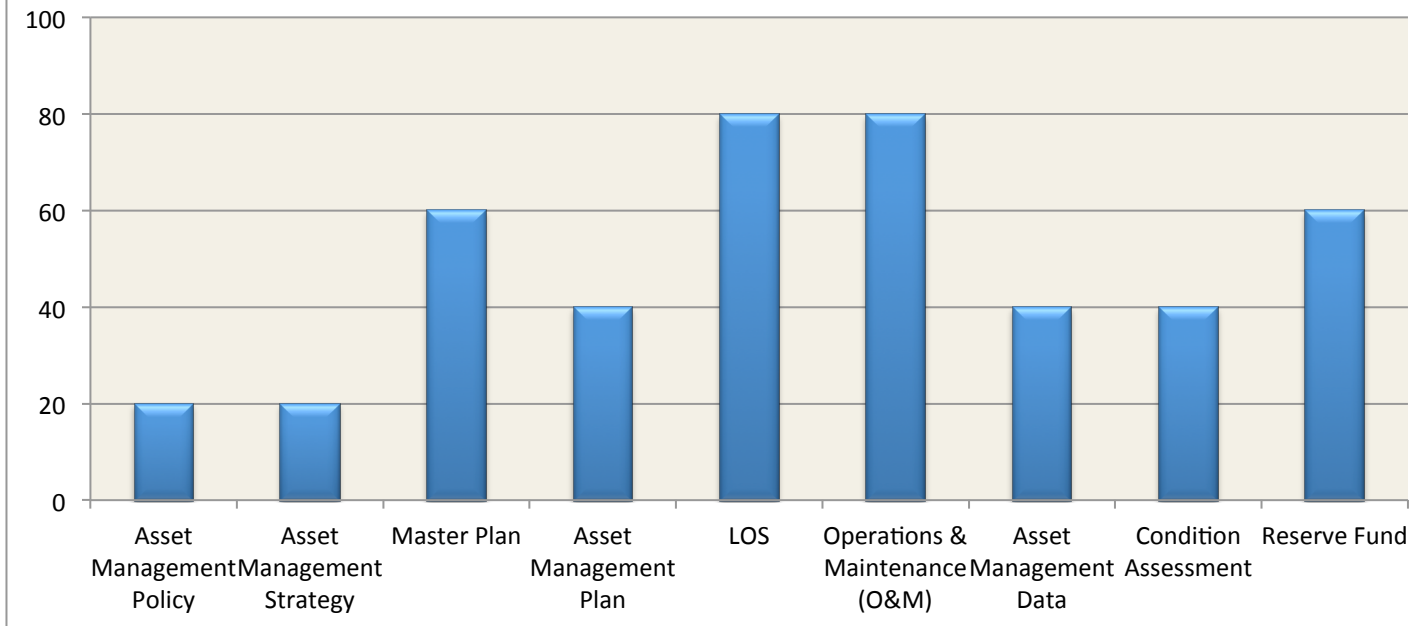
Table 46: Maturity Level of Assessment Elements - Central York Fires Services

ID	Assessment Element	Score	Status
110	Asset Management Policy	20	Aware

ID	Assessment Element	Score	Status
120	Asset Management Strategy	20	Aware
130	Master Plan	60	Developing
140	Asset Management Plan	40	Establishing
210	LOS	80	Competence
420	Operations & Maintenance (O&M)	80	Competence
520	Asset Management Data	40	Establishing
620	Condition Assessment	40	Establishing
920	Reserve Fund	60	Developing

This service area is not fully under the control of the Town, therefore a limited set of questions was used in the assessment of the service area to establish the basic level of asset management maturity.

Asset Management Maturity Assessment Results – Central York Fire Services



Assessment Questionnaire and Evidence

Table 47: Central York Fire Services Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
1	Strategy and Planning	Has an asset management policy been written, documented, authorised and communicated across the organization? Does it align with current applicable legislation, regulatory and statutory requirements and other organizational policies?	1	Although some aspects are considered in 2014 Fire Department Master Plan Update, there is not an established AM Policy
2	Strategy and Planning	Has an asset management strategy been written, documented, authorised and communicated across the organization? Is it consistent with other appropriate organizational policies and strategies, and the needs of stakeholders?	1	Although some aspects are considered in 2014 Fire Department Master Plan Update, there is not an established AM Strategy
3	Strategy and Planning	Does the organization's asset management strategy take account of the lifecycle of its assets, asset types and asset systems?	1	There is no formal AM Strategy in place.
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	3	2014 Fire Department Master Plan Update is prepared, it is high level and not provided at component level Talks about population change There is no formal AM Strategy and AMP to be aligned with
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	2	Although some aspects are considered in 2014 Fire Department Master Plan Update, there is not an established AMP Reports to JCC are also available and includes replacement times and costs There is no formal AM Strategy to be aligned with
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be	2	Life cycle requirements for Building and Heavy Trucks are identified

Q#	Assessment Area	Question	Score	Evidence - Summary
		managed.		
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	4	Level of Service that is approved by JJC is provided. Response time is measured but not achieved the target, so fire service is planning to add the fifth fire station. Customer LOS is documented (6 min response), technical LOS should be included in Master Plan Update. Response time for all incidents is same, but response depth (how much resources required to send) is different. Risk levels are determined and number of required equipment and staff for each level is clearly defined. In determining the level of service, cost is considered and analysed.
15	Life Cycle Practices	Has the organization established, implemented and maintains processes for operations and maintenance including plans, so they are carried out and under specified condition and aligned with asset management strategies? E.g. during utilization (operation) of assets, during maintenance (and inspection) of assets? Is the organization aware of O&M cost of its assets?	4	For all non-building assets, O&M are understood and implemented. Costs are tracked and documented, but not analysed and reviewed (it is part of annual budget program). Reports only focus on expending and remaining budget.
18	Asset Data and Information	Has the organization identified the asset related data it requires to support the asset management activities?	2	Fire service is aware of required data, but they have shortage to resources to document and collect it.
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	2	For heavy fleet service time, cost, numbers and etc. is collected. For facilities, fire service is in the process of establishing the program. There is no condition rating in place. Replacement is generally scheduled based on age and not condition.

Q#	Assessment Area	Question	Score	Evidence - Summary
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	3	Fire service has reserve fund in place and it is based on Master Plan Update. Asset Replacement Fund is one of the reserve types. Reserve funds do not meet the requirement.

Appendix J: Newmarket Public Library Sector Results

Current State Assessment Workshop Details

Workshop Date: Tuesday 09 August 2016

Workshop location: Planning Room

Workshop participants:

Table 48: Public Library workshop participants

Attendee	Position/Organization	Attendee	Position/Organization
Todd Kyle	Chief Executive Officer/ Public Library	Amir Ebrahimi	Yaku Consulting
Lisa Ellis	Business Performance Coordinator / Town	Khurram Aziz	Yaku Consulting
Dean Rurak	Yaku Consulting		

Assets in the Sector

Table 49: Public Library Assets

Class	Type	Responsibility
Infrastructure	Library Building	Facilities
Books		Public Library
CD/VHS/DVD		Public Library
Furniture		Public Library
IT Assets	Network Assets (e.g. servers, routers)	Public Library
	End User Assets (e.g. computers, laptops, printers, scanners)	Public Library

Asset lifecycle activity management

Other than as indicated in the table above, facility group relies on following for assistance with major lifecycle activities, or provides the following additional services:

- XIII. Projects that cost more than \$100,000 is outsourced (e.g. HVAC maintenance)

Assessment Results

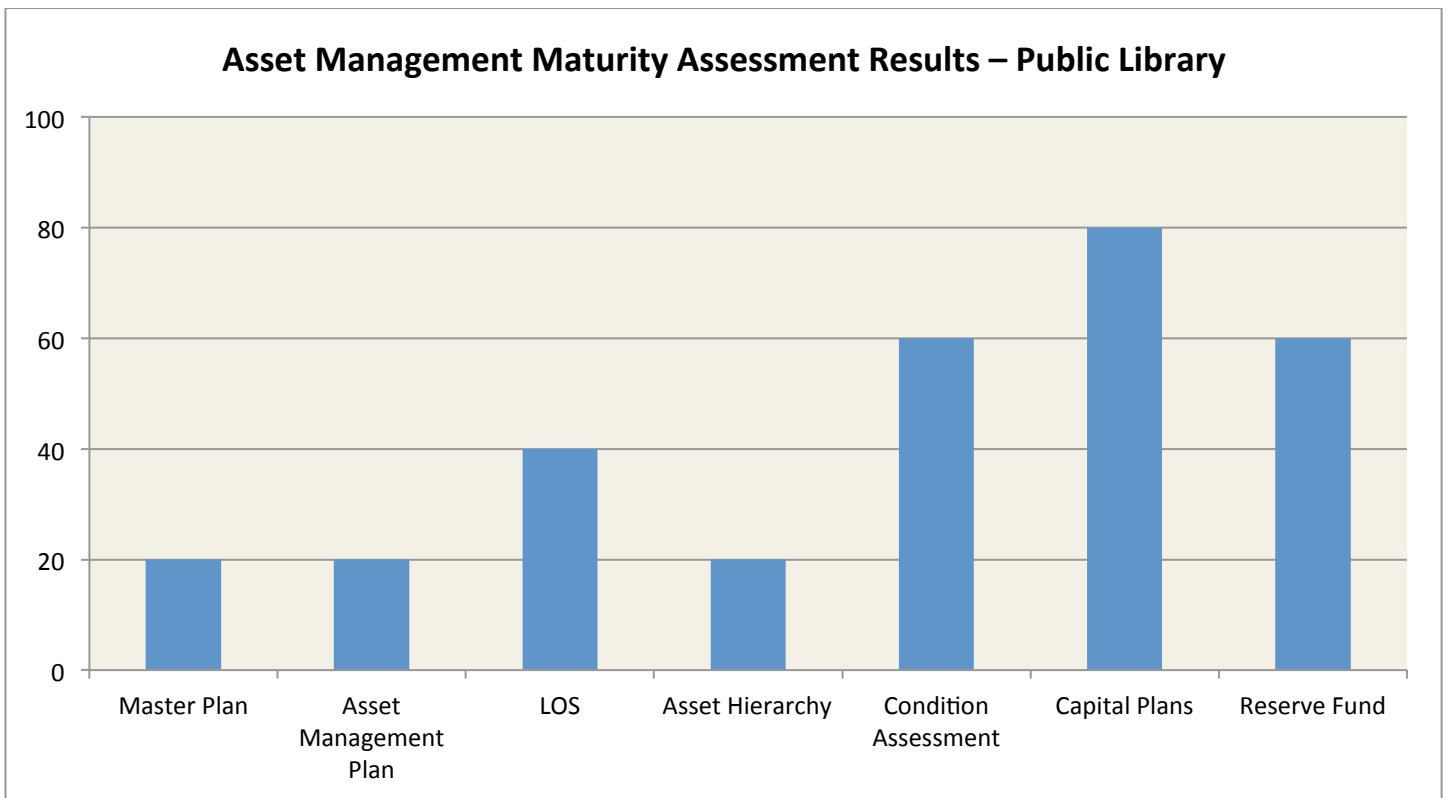
Newmarket public library sector attained an overall maturity level of “Establishing” in terms of its asset management processes, procedures, and practices.

Table 50 below defines the overall asset management maturity levels for the assessment elements.

Table 50: Maturity Level of Assessment Elements – Public Library

ID	Assessment Element	Score	Status
130	Master Plan	20	Aware
140	Asset Management Plan	20	Aware
210	LOS	40	Establishing
510	Asset Hierarchy	20	Aware
620	Condition Assessment	60	Developing
820	Capital Plans	80	Competence
920	Reserve Fund	60	Developing

This service area is not fully under the control of the Town, therefore a limited set of questions was used in the assessment of the service area to establish the basic level of asset management maturity.



Assessment Questionnaire and Evidence

Table 51: Public Library Assessment Evidence

Q#	Assessment Area	Question	Score	Evidence - Summary
4	Strategy and Planning	Is there a formal master planning document? Does it consider various factors such as change in demand, risk, financial? Does it align with other plans and strategies such as the asset management plan?	1	There is not a formal established master plan. Projects for answering change in demand are not identified.
5	Strategy and Planning	Is there a formally documented Asset Management Plan? Does it align with the organizations business objectives, asset management objectives, and asset management strategy?	1	Although some aspects are determined and documented, there is not an established AMP.
6	Strategy and Planning	Does the organization establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems? E.g. The Asset Management Plan details how the asset will be operated and maintained, and how risk will be managed.	1	Although some aspects are determined and documented, there is not an established AMP.
9	Demand Analysis	Have the Levels of Service been identified and the link between performance, risk and cost been established?	2	Level of use is carefully monitored and tracked (e.g. registered members, borrowings, etc.). Two LOS indicators are in place on is sqft/capita (min target is 0.6) and one is volume/capita (min target is 2.2). Link between performance, risk and cost has not been identified.
17	Asset Data and Information	Has the organization provided asset hierarchies for its assets? Is it determined what data should be collected at each level of hierarchies for each life cycle phase?	1	Asset hierarchies are not clearly defined.

Q#	Assessment Area	Question	Score	Evidence - Summary
22	Monitoring & Improvement	Does the organization assess the condition of its assets? Has the organization established process for the condition assessment, the extent of data to be recorded, and the frequency of collecting it?	3	Building Condition Assessment (BCA) for facility is completed. Physical condition assessment for books, customer reports for CDs and vendor inspection for equipment (e.g. HVAC) are in place but they are not formally documented and in many cases they are subjective assessments.
27	Decision Making	Is there a process to identify the long-term asset renewal and rehabilitation requirements and integrate plans across service sectors?	4	Asset replacement plan is in place. It is based on condition assessment results and UEL. Technology changes are considered in asset replacement plan. Books, CDs and material are paid by operating budget but they are reported in capital budget.
31	Finance	Does the organization identify the required reserve fund for different service areas? Is reserve fund available?	3	Reserve funds are available in asset replacement fund. Reserve targets are frequently reviewed and corrected based on technology and requirements changes.

Appendix K: Asset Management Gaps and Needs

Table 52: Asset management needs and gaps

Score	AM Element	Gap Assessment	Need
	Asset Management Program	Formal AM/ AM improvement program has not been established	10-1 Adopt asset management strategy roadmap
			10-2 Develop/adopt the asset management framework identified in the AM policy
47	Asset Management Policy	<i>No specific project in this period</i>	Improvement after communication as part of AM program
30	Asset Management Strategy	Completion and adoption of a formal Asset Management Strategy	120-1 Newmarket Asset Management Strategy (this project)
37	Master Plan	Master planning process not linked with AM Plan	130-1 As and when master plans are developed, evaluate in context of current AMP for alignment. Example: look at rehab needs when considering expansion
33	Asset Management Plan	AM Plan not developed for all asset classes; weak link between LOS and Asset Strategy; responsibility for Stormwater not well defined	140-1 Define and assign responsibility for stormwater assets
			140-2 Develop AMP for missing asset classes
			140-3 Update AMP and improve link between LOS and Asset strategy (future)
52	Contingency Planning	Business continuity and asset specific contingency plans not in place	150-1 Develop business continuity and asset contingency plans for critical assets
47	Asset Strategy	Current AM practice not fully reflected in AMP asset strategy	160-1 Evaluate and document lifecycle practices
43	LOS	Limited formal customer LOS, and no link between customer LOS and technical KPIs or program KPIs	210-1 LOS Model: define LOS and KPIs, and model associated activities and costs associated with it
			210-2 LOS: Collect data and validate model; engage customers in setting LOS (future)
40	Asset Demand	Asset demand not formally captured for many assets	220-1 Define how to measure asset demand and evaluate future demand against current capacity
28	Asset Management Structure	Organization and responsibility for Asset Management not formally defined	310-1 Develop AM roles and responsibility matrix and incorporate into job descriptions

Score	AM Element	Gap Assessment	Need
			310-2 Create or designate Asset Manager position to provide guidance and oversee implementation of AM within the Town
54	Competency	Limited AM specific training	320-1 Identify required AM specific training and develop learning plan for the organization
49	Outsourcing	<i>No specific project in this period</i>	Outsourcing is highly ranked
57	Acquisition	<i>No specific project in this period</i>	Improvements due to other elements
60	Operations & Maintenance (O&M)	O&M activities not integrated with asset strategy including costs	420-1 Document current O&M practices, coordinate with asset strategy, and evaluate and document O&M costs
46	Performance Modeling	Formal deterioration curves have not been developed	430-1 Develop asset performance lifecycle (deterioration) model
40	Asset Hierarchy	Asset hierarchy, asset identification, and asset attribute systems are not well defined for asset management purposes	510-1 Develop asset hierarchy from FIR reporting to the maintenance managed item level
37	Asset Management Data	Very likely that the data collected is not all the required data for asset management purposes	520-1 Evaluate data collected after identifying required and critical data and identify gaps
37	Asset Management Data Availability	<i>No specific project in this period</i>	Improvement due to Asset Hierarchy, Data Standards
43	Information Systems	Lack of a comprehensive asset management system which tracks assets condition and performance; difficult user interface on JDE work management module and not deployed for all asset classes	540-1 Evaluate needs, develop user requirements for software and develop TOR for procurement (Phase 2 of this project)
			540-2 Procure asset management software, and configure and implement, and identify key integration points with JDE
			540-3 Develop information system requirements for asset management and a plan to integrate systems, e.g. GIS and CMMS
40	Performance Assessment	No formal performance assessment system in place	610-1 Develop asset performance assessment framework and system
50	Condition Assessment	There is no standard framework for condition measurement (e.g. 1 to 5) across asset classes and frequency of data collection may not be optimal	620-1 Establish standard condition grading framework and align to asset class condition scales
			620-2 Evaluate and establish condition assessment framework (e.g. frequency)

Score	AM Element	Gap Assessment	Need
66	Performance Improvement	<i>No specific project in this period</i>	
37	Risk Management	Risk management framework is not in place nor standard method to assess risk	710-1 Develop Risk Management Framework
33	Risk Assessment	Critical assets are not formally defined and understood	720-1 Conduct a risk assessment and identify high consequence assets and critical assets
44	Optimized Decision Making	No formal ODM technique is used to evaluate alternatives or compare across sectors	810-1 Evaluate, select and incorporate ODM techniques into O&M and capital plan process
60	Capital Plans	820-1 Optimize the capital plan with updated asset information	Improvement due to Risk, ODM and Asset Strategy
70	Capital Projects Integration	<i>No specific project in this period</i>	Integration process is highly ranked
47	Non-Capital Projects	<i>No specific project in this period</i>	Improvement due to Risk, ODM and Asset Strategy
35	Financial and Funding Strategy	Long range forecast of rehabilitation and replacement precedes formal asset strategy and asset management plan	910-1 Update capital financing sustainability plan
60	Reserve Fund	Reserve established prior to formal asset strategy and asset management plan	920-1 Update reserve fund policy
60	PS3150		
30	Data Standards	No formal data standards	1010-1 Develop data standards aligned with asset hierarchy
33	Data Owner	No formal data owner or stewards	1020-1 Establish data roles - owners, users, collector
30	Information Quality	No formal process to check or manage data quality	1030-1 Establish QA/QC procedures and evaluate quality of critical asset data
60	Data Sharing	<i>No specific project in this period</i>	Improvements due to Data Standards, Data Owner, Information Quality

Table 53: Sector involvement in projects

- Legend: P = Participation in Town wide project
- IP = Individual project as applicable to the sector

Assessment Element	Project Action	R.O.W	Facilities	Fleet	W&WW	Parks	IT
Asset Management Program	10-1 Adopt asset management strategy roadmap (this project)	P	P	P	P	P	P
	10-2 Develop/adopt the asset management framework identified in the AM policy	P	P	P	P	P	P
Asset Management Policy	<i>No specific project in this period</i>						
Asset Management Strategy	120-1 Newmarket Asset Management Strategy (this project)	P	P	P	P	P	P
Master Plan	130-1 As and when master plans are developed, evaluate in context of current AMP for alignment. Example: look at rehab needs when considering expansion						
Asset Management Plan	140-1 Define and assign responsibility for stormwater assets	P			P		
	140-2 Develop AMP for missing asset classes	IP	IP	IP	IP	IP	IP
	140-3 Update AMP and improve link between LOS and Asset strategy (future)	P	P	P	P	P	P
Contingency Planning	150-1 Develop business continuity and asset contingency plans for critical assets	IP	IP	IP	IP		IP
Asset Strategy	160-1 Evaluate and document lifecycle practices	P	P	P	P	P	P
LOS	210-1 LOS Model: define LOS and KPIs, and model associated activities and costs associated with it	P/IP	P/IP	P/IP	P/IP	P/IP	P
	210-2 LOS: Collect data and validate model; engage customers in setting LOS (future)	P	P	P	P	P	P
Asset Demand	220-1 Define how to measure asset demand and evaluate future demand against current capacity	IP	IP	IP	IP	IP	IP
Asset Management Structure	310-1 Develop AM roles and responsibility matrix and incorporate into job descriptions	P	P	P	P	P	P

Assessment Element	Project Action	R.O.W	Facilities	Fleet	W&WW	Parks	IT
	310-2 Create or designate Asset Manager position to provide guidance and oversee implementation of AM within the Town						
Competency	320-1 Identify required AM specific training and develop learning plan for the organization	P	P	P	P	P	P
Outsourcing	<i>No specific project in this period</i>						
Acquisition	<i>No specific project in this period</i>						
Operations & Maintenance (O&M)	420-1 Document current O&M practices, coordinate with asset strategy, and evaluate and document O&M costs	IP	IP	IP	IP	IP	IP
Performance Modelling	430-1 Develop asset performance lifecycle (deterioration) model	IP	IP	IP	IP	IP	
Asset Hierarchy	510-1 Develop asset hierarchy from FIR reporting to the maintenance managed item level	P	P	P	P	P	P
Asset Management Data	520-1 Evaluate data collected after identifying required and critical data and identify gaps	IP	IP	IP	IP	IP	
Asset Management Data Availability	<i>No specific project in this period</i>						
Information Systems	540-1 Evaluate needs, develop user requirements for software and develop TOR for procurement (Phase 2 of this project)	P	P	P	P	P	P
	540-2 Procure asset management software, and configure and implement, and identify key integration points with JDE	P	P	P	P	P	P
	540-3 Develop information system requirements for asset management and a plan to integrate systems, e.g. GIS and CMMS	P	P	P	P	P	P
Performance Assessment	<i>No specific project in this period</i>	P	P	P	P	P	P
Condition Assessment	620-1 Establish standard condition grading framework and align to asset class condition scales	P	P	P	P	P	P
	620-2 Evaluate and establish condition assessment framework (e.g. frequency)	IP	IP	IP	IP	IP	IP

Assessment Element	Project Action	R.O.W	Facilities	Fleet	W&WW	Parks	IT
Performance Improvement	<i>No specific project in this period</i>						
Risk Management	710-1 Develop Risk Management Framework	P	P	P	P	P	P
Risk Assessment	720-1 Conduct a risk assessment and identify high consequence assets and critical assets	IP	IP	IP	IP	IP	IP
Optimized Decision Making	810-1 Evaluate, select and incorporate ODM techniques into O&M and capital plan process	P	P	P	P	P	P
Capital Plans	820-1 Optimize the capital plan with updated asset information	IP	IP	IP	IP	IP	IP
Capital Projects Integration	<i>No specific project in this period</i>						
Non-Capital Projects	<i>No specific project in this period</i>						
Financial and Funding Strategy	910-1 Update capital financing sustainability plan	P	P	P	P	P	P
Reserve Fund	920-1 Update reserve fund policy	P	P	P	P	P	P
PS3150	<i>No specific project in this period</i>						
Data Standards	1010-1 Develop data standards aligned with asset hierarchy	IP	IP	IP	IP	IP	IP
Data Owner	1020-1 Establish data roles - owners, users, collector	P	P	P	P	P	P
Information Quality	1030-1 Establish QA/QC procedures and evaluate quality of critical asset data	IP	IP	IP	IP	IP	IP
Data Sharing	<i>No specific project in this period</i>						

Appendix L: Implementation Schedule

ID	WBS	Task Name	Duration	Start	Finish	2017		2018		2019		2020		2021		2022	
						H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
0	0	Newmarket Implementation Plan	60 mons	Mon 17-01-09	Tue 21-12-21												
1	1	Governance	12 mons	Mon 17-01-09	Tue 17-12-26												
2	1.1	120-1 Adopt Newmarket Asset Management Strategy (this project)	0 mons	Mon 17-01-09	Mon 17-01-09												
3	1.2	310-2 Create or designate Asset Manager position to provide guidance and oversee implementation of AM within the Town	3 mons	Mon 17-01-09	Wed 17-04-05												
4	1.3	140-1 Define and assign responsibility for stormwater assets	1 mon	Mon 17-01-09	Mon 17-02-06												
5	1.4	140-2 Develop AMP for missing asset classes	4 mons	Tue 17-02-07	Fri 17-06-02												
6	1.5	510-1 Develop asset hierarchy from FIR reporting to the maintenance managed item level	3 mons	Thu 17-04-06	Mon 17-07-03												
7	1.6	310-1 Develop AM roles and responsibility matrix and incorporate into job descriptions	1 mon	Thu 17-04-06	Thu 17-05-04												
8	1.7	1020-1 Establish data roles - owners, users, collector	1 mon	Fri 17-05-05	Fri 17-06-02												
9	1.8	210-1 LOS Model: define LOS and KPIs, and model associated activities and costs associated with it	6 mons	Tue 17-07-04	Tue 17-12-26												
10	1.9	320-1 Identify required AM specific training and develop learning plan for the organization	3 mons	Mon 17-06-05	Wed 17-08-30												
11	2	Capital Program Decision Making	15 mons	Mon 17-06-05	Wed 18-08-29												
12	2.1	820-1 Optimize the capital plan with updated asset information	2 mons	Mon 17-06-05	Tue 17-08-01												
13	2.2	620-1 Establish standard condition grading framework and align to asset class condition scales	2 mons	Tue 17-07-04	Wed 17-08-30												
14	2.3	160-1 Evaluate and document lifecycle practices	4 mons	Thu 17-08-31	Tue 17-12-26												
15	2.4	430-1 Develop asset performance lifecycle (deterioration) model	3 mons	Mon 18-01-08	Wed 18-04-04												
16	2.5	710-1 Develop Risk Management Framework	4 mons	Tue 18-02-06	Fri 18-06-01												
17	2.6	720-1 Conduct a risk assessment and identify high consequence assets and critical assets	3 mons	Mon 18-06-04	Wed 18-08-29												
18	3	Data and Information	10 mons	Mon 18-06-04	Tue 19-04-02												
19	3.1	1010-1 Develop data standards aligned with asset hierarchy	5 mons	Mon 18-06-04	Fri 18-10-26												
20	3.2	540-3 Develop information system requirements for asset management and a plan to intergate systems, e.g. GIS and CMMS	5 mons	Mon 18-10-29	Tue 19-04-02												

ID	WBS	Task Name	Duration	Start	Finish	2017		2018		2019		2020		2021		2022	
						H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
21	3.3	520-1 Evaluate data collected after identifying required and critical data and identify gaps	1 mon	Mon 18-10-29	Mon 18-11-26												
22	3.4	1030-1 Establish QA/QC procedures and evaluate quality of critical asset data	2 mons	Tue 18-11-27	Fri 19-02-01												
23	4	Maintenance	13 mons	Mon 18-10-29	Fri 19-11-22												
24	4.1	420-1 Document current O&M practices, coordinate with asset strategy, and evaluate and document O&M costs	3 mons	Mon 18-10-29	Fri 19-02-01												
25	4.2	540-2 Procure asset management software, and configure and implement, and identify key integration points with JDE	8 mons	Wed 19-04-03	Fri 19-11-22												
26	5	Optimizing AM Program	25 mons	Mon 19-11-25	Tue 21-12-21												
27	5.1	610-1 Develop asset performance assessment framework and system	2 mons	Mon 19-11-25	Thu 20-01-30												
28	5.2	620-2 Evaluate and establish condition assessment framework (e.g. frequency)	2 mons	Fri 20-01-31	Mon 20-03-30												
29	5.3	210-2 LOS: Collect data and validate model; engage customers in setting LOS (future)	2 mons	Tue 20-03-31	Wed 20-05-27												
30	5.4	810-1 Evaluate, select and incorporate ODM techniques into O&M and capital plan process	2 mons	Thu 20-05-28	Fri 20-07-24												
31	5.5	150-1 Develop business continuity and asset contingency plans for critical assets	4 mons	Mon 20-07-27	Thu 20-11-19												
32	5.6	140-3 Update AMP and improve link between LOS and Asset strategy (future)	6 mons	Wed 20-09-23	Wed 21-03-31												
33	5.7	910-1 Update capital financing sustainability plan	8 mons	Thu 21-04-01	Mon 21-11-22												
34	5.8	920-1 Update reserve fund policy	1 mon	Tue 21-11-23	Tue 21-12-21												
35	5.9	130-1 As and when master plans are developed, evaluate in context of current AMP for alignment. Example: look at rehab needs when considering expansion	0 mons	Fri 20-12-25	Fri 20-12-25												
36	5.10	220-1 Define how to measure asset demand and evaluate future demand against current capacity	0 mons	Fri 21-07-30	Fri 21-07-30												