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Asset Management Roadmap

City of Yellowknife

August 22, 2019

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City of Yellowknife
4807 52nd Street
Yellowknife, NT
X1A 2N4

Attention: Sharolynn Woodward
                     Director, Corporate Services

Asset Management Roadmap (Final)

We are pleased to present the final report on the Asset Management Roadmap, a project identifying the initiatives to move the City forward in your asset management journey.

We have incorporated you feedback and have finalized the report accordingly.

We thank you for the opportunity to support the City in the development of the roadmap.

Sincerely,
DILLON CONSULTING LIMITED

Darla Campbell, P.Eng.
Project Manager

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Encl.
Our file: 19-9880

Disclaimer

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1.0 | Introduction

1.1   Background

The City of Yellowknife (the "City") retained Dillon Consulting to undertake an Asset Management Roadmap to direct the City's next steps along the asset management continuum. The objective of this project was to implement the recommendations from the Asset Management Working Group, which included:

- Assessing the current and future usability of previously collected data
- Determining the status of City practices compared with best practice
- Based on the outcome of the analysis, developing a roadmap to guide the City's progress towards more advanced asset management practices

The City has initiated asset management endeavours in the past, with limited success. The intention of this Roadmap is to provide an achievable program through which asset management can be successfully introduced and implemented.

The final deliverable on the project presents a comprehensive timeline of tasks and milestones that identifies the work to be done with an assignment of responsibilities to complete it. The roadmap includes training requirements, achievable schedules and approximate costs. Further, the roadmap provides a high level, prioritized strategy for the City's progress along the asset management continuum.

The Roadmap is developed for an outlook of five years, with the current year (2019) as year zero.

The City participated in a Roadmap Test Drive workshop on June 28, 2019 to review the components of the Roadmap and validate its feasibility relative to the available resources and intentions of the City.

1.2   Current State and Vision

The Roadmap was developed based on input provided by the City including the self-assessment of the current state of asset management practices and the desired future state, or vision of asset management in the future.

The current state was determined through a series of interviews as well as desktop exercise and review of existing City documentation. The future desired state was identified in the Vision Workshop. Detailed information regarding the current state and vision can be found in the **Current State Technical Memo**, included as *Appendix A*.

Asset Management Advancement Scale

Most assessment tools are based on standards and best practice in asset management including ISO55000, PAS55, and the International Infrastructure Management Manual (IIMM). Most utilize a 1 to 5 scale to measure state of practice maturity against various asset management practice areas, where 1 is for those organizations just starting out, and 5 is considered beyond the ISO Standard. For example, the maturity level scale ratings can be described as:

1. Awareness
2. Establishing
3. Competence
4. Enterprising
5. Excelling

The City indicated that generally they were in the early stages of establishing a system, which is beyond Awareness.

Through the Vision Workshop, the City indicated that their goal in asset management is to be Excelling. In the gap analysis, the level of effort and resources to achieve Excelling was identified as significant and likely difficult to achieve in the five year horizon of the current Roadmap.

After reviewing the draft Roadmap and understanding the tasks and resources required to advance asset management in a sustainable path, an interim target was set within the 5 year time frame (2019-2025) of the AM Roadmap as the a late stage of Establishing and beginning of Competence. Through implementation of the Roadmap as presented in this document, the City could achieve a rating of Competence. The maturity scale is shown in **Figure 1** with the future and current states identified.
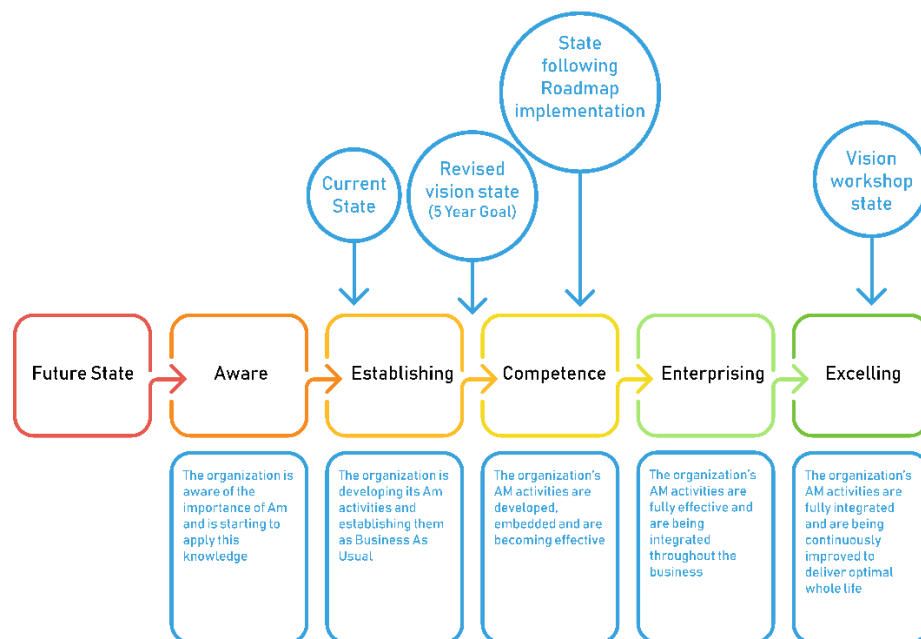
Figure 1: Scale of Future and Current States of Asset Management

1.3   Roadmap Document

The Roadmap identifies opportunities which are tasks and milestones associated with the implementation of asset management at the City. The opportunities follow the FCM asset management readiness scale and are organized by assessment area and elements. The opportunities within the Roadmap have been prioritized in such a sequence that stage-setting documentation is established at the outset of the Roadmap and each subsequent opportunity will further advance the level of asset management within the City. The opportunities have been devised in such a way that with appropriate internal and external resources, they can be achieved within the indicated timeframe.

The implementation of a successful Asset Management system at the City requires buy-in and participation from all levels of staff throughout affected departments. Asset management is a philosophy of ongoing service and asset management and not a task undertaken once.

The Roadmap is included as ***Appendix B***, and is presented with three sections, as described below.

1.3.1   Section A – Asset Management Elements and Readiness Levels

Section A of the Roadmap includes five asset management competency areas defined in the FCM asset management readiness scale (1 through 5) with a sixth area added to the framework, which includes:

1. Policy & Governance
2. People & Leadership
3. Data & Information
4. Planning & Decision Making
5. Contribution to Asset Management Practice
6. Asset Management Practices, Processes, and Procedures

This is consistent with the framework used during the current state assessment.

The competencies were further broken down into 18 asset management outcome areas, for which the City was provided definition for five levels of readiness, and each department self-assessed by providing ratings from 0 to 5 for the readiness of their department. The 18 outcome areas are included in **Table 1**.

Table 1:   Asset Management Outcome Areas for Each Competency

Competency Areas	Asset Management Outcome Areas
Policy & Governance	1. Policy & Objectives
	2. Strategy & Framework
	3. Measurement & Monitoring
People & Leadership	4. Cross-Functional Groups
	5. Accountability
	6. Resourcing & Commitment
Data & Information	7. Asset Data
	8. Performance Data
	9. Financial Data
Planning & Decision-Making	10. Documentation & Standardization
	11. Asset Investment Plans
	12. Budgets
Contribution to Asset Management Practice	13. Training & Development
	14. Knowledge Sharing – Internal
	15. Knowledge Sharing – External
Asset Management Practices, Processes, and Procedures	16. Risk Management
	17. Levels of Service (LOS)
	18. Asset Management Plan

Using shading, Section A indicates the level at which the City has self-assessed at current state (orange shading), and the level at which implementation of the Roadmap can achieve (yellow shading). A summary column indicating the overall average of the current state rankings is shown in the Roadmap.

This approach is illustrated in the figure below.

Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing
1	Policy & Governance	Policy & Objectives	Senior management has committed to formalizing an AM program.	We have drafted an AM policy. Senior management and council have endorsed the AM policy.	We are starting to use AM policy objectives to guide our actions.

Figure 2: Levels of Readiness

City of Yellowknife
Asset Management Roadmap
August 2019

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1.3.2   Section B – Asset Management Opportunities

Section B of the Roadmap includes the opportunities and information related to their implementation. Each opportunity is indicated using a description of the task and a tracking identification code. A priority is given to each opportunity on a high/medium/low scale, and a corresponding timeline for its completion. We note that some tasks are expected to be completed across multiple years – as ongoing opportunities, or different years by department. The assessment level to be achieved through implementation of each opportunity is also indicated.

Section B further identifies the department or group with whom the responsibility of its completion lies. We note that this is based on the current structure of the City, and should be updated accordingly pending any changes to municipal structure.

In order to show linkages between the opportunities and the areas of competency, the opportunities are numbered to coincide with the outcome area (Initiatives 1 through 18).

1.3.3   Section C – Costs and Resources

Section C of the Roadmap includes an estimation of the costs and resources required to undertake each of the opportunities described in Section B. The costs and resources are based on an order of magnitude estimate of costs and resources considering a mix of external and internal resources. The resources are quantified in "days per opportunity". The costs were determined by assuming an external cost of $150/hour and 8 hour days, and internal City staff cost of $75/hour and 7 hour days. Allowance for external resource expenses is assumed included in the hourly rate, noting the potential for variability in this cost.

2.0 | Asset Management Roadmap

The high level overview of the AM Roadmap is presented in **Table 2**.

Table 2:   Roadmap Overview

Year	Description of Opportunities
Year 0 (2019) Theme: Raising awareness	Asset management is a team sport requiring broad support across the organization. Year zero, the current year 2019, envisions the City developing key documents collaboratively and bringing them forward to Council. This includes the AM Roadmap, AM Policy and AM Strategy and Vision.
	The Roadmap provides an overview of the development of the asset management system, and the key resources needed at its inception in order to deliver successful implementation and sustainable asset management practices.
Year 1 (2020) Theme: Building the base	Following the successful launch of the AM Roadmap through Council adoption and the annual budget process, a solid base for asset management is set by the establishment of roles and responsibilities within the asset management framework and initiating data management opportunities, as well as a corporate risk framework. The opportunities in Year One and onward will be guided by the policy, vision and roadmap established during Year Zero of the AM Roadmap.
Year 2 (2021) Theme: Asset Performance	During Year Two of the AM Roadmap, the condition of assets is determined with a standardized methodology, and the expected level of service in order to establish a baseline for evidence-based service and capital planning.
Year 3 (2022) Theme: Asset Management Plans	While there is a continued focus on opportunities that contribute to asset management practices on-going from previous years, in Year Three a comprehensive update to the asset management plan(s) can be made using the practices and information from the preceding years.
Year 4 (2023) Theme: Integration with Demand Management	In Year Four, master planning is undertaken to complete the picture of service and asset requirements integrating the AMPs with the planning exercise. Work continues on developing AMPs across all City assets and enhancing those completed with validated asset strategies.
Year 5 (2024) Theme: Operations and Recalibration	The last year of the AM Roadmap sees a shift towards maintenance improvements, and the implementation of the Roadmap is reviewed, and recalibrated based on new information.

A chart of the annual opportunities within the Roadmap is attached as *Appendix C*. Further details regarding each opportunity are provided in the following sections.

2.1 | 2019 – Year Zero

Year zero is the current year, 2019. This envisions the City developing its Roadmap and bringing it forward to Council. The Roadmap provides an overview of the development of the asset management system, and the key resources needed at its inception in order to deliver successful implementation and sustainable asset management practices.

The City's draft documents, the asset management policy and the asset management strategy, are a good starting point from which to develop best practice documents that includes broad stakeholder engagement (all organizational units), and Council approval.

Introducing the asset management policy and the asset management strategy and vision through stakeholder engagement is an excellent way to leverage this document as part of an overall communications strategy to obtain buy-in for asset management.

2.1.1 | Policy & Governance

G1.1 - Update AM policy consistent with best practice

The City's draft asset management policy is a good starting point from which to develop a best practice asset management policy that includes broad stakeholder engagement, and Council approval.

Introducing the asset management policy through stakeholder engagement including the staff and management of the City and Council is an excellent way to leverage this document as part of an overall communications strategy to obtain buy-in for asset management.

G2.1 - Update AM vision consistent with best practice

An asset management vision document was previously drafted by the City. This document should be updated based on the current vision of the City, based on discussions subsequent to the original document. It can be completed in conjunction with the asset management policy.

G2.2 - Refine and adopt through Council the AM Roadmap

Approval by Council of the AM Roadmap will be required to implement the strategies contained herewith.

G3.1 - Define the expected AM system benefits and outcomes

The benefits and outcomes of the asset management system will have been determined during the development of the AM Vision document that the City has drafted. This document should be updated in conjunction with opportunity G2.1.

G3.2 - Document AM system plans and objectives for the coming year

As part of the 2020 budget process, the specific objectives and plans should be outlined for the coming year. The results of this work should match with the intended Roadmap.

2.1.2   People and Leadership

G4.1 - Define and restructure role for AM working group and AM Manager in 2020 budget process

Based on an understanding of City needs, the roles of the AM Working Group and anticipated new asset management staff are to be defined to stipulate responsibilities and strategy within the City for implementation of asset management opportunities. Results of this opportunity can be included within the AM Roadmap Council report.

Additional staff capacity will be required, including dedicated AM management responsibility augmented by support capacity within key operational units.

G5.1 - Establish mandate and terms of reference for AM working group

A working group has been established, and will be used through the implementation of the asset management roadmap. The working group should be formalized to maintain a consistent roster of staff members and to establish protocols and responsibilities within the group. The terms of reference and mandate should be developed and included within the AM Roadmap report to Council.

Additional discussion regarding the organization for asset management relative to mandate for the asset management working group can be found in **Section 3.1**.

G6.1 - Council buy-in and support for AM and approved funding

Council receives a report at least once a year on Asset Management activities and progress on the Asset Management Roadmap, and understands the importance/ impact of required funding for approval.

2.1.3   Contribution to Asset Management Practice

CAM13.1 - Selected staff are trained on basic asset management concepts

Basic asset management training can be provided to key staff at the outset of the Roadmap process. Efficiencies in providing training can be investigated, including combining training efforts with other organizations in the region that perform asset management works.

2.1.4   Asset Management Practices, Processes and Procedures

D18.2 - Employ Cityworks for work management, and link work to assets rather than activities

Usage of the Cityworks program will be changed to facilitate linkage of works to assets, to maintain a comprehensive log of work that is associated with the individual assets, to broaden the asset database. Some training may be required to enable differing usage of the software.

Opportunity to be initiated in 2019 and implemented in 2020.

2.2   2020 – Year One

A key element in the AM Roadmap as part of Year One is the establishment of roles and responsibilities within the asset management framework, and to initiate data management and evaluation opportunities. The opportunities in Year One and onward will be based on the policy, vision and roadmap established during Year Zero of the AM Roadmap.

2.2.1   Policy & Governance

G1.2 - Use policy to guide actions

The approved asset management policy will be used to influence and guide asset management actions moving forward.

G3.3 - Establish performance measures to monitor AM system progress, outcomes and benefits to community

Based on the policy, vision and AM Roadmap, the City will expand on the opportunities discussed to define measures against which the progress of the asset management system implementation can be measured. The performance measures should be quantifiable, attainable, and within a reasonable timescale.

2.2.2   People and Leadership

G5.2 - Define the desired roles, responsibilities and competencies and add to staff job descriptions

Included in the AM Roadmap is an estimate of the resources required to continue to improve the asset management system. Based on the needs required and the understanding that members of staff throughout the organization will be required to be part of asset management activities, the job descriptions should be updated to reflect the expanded roles.

2.2.3   Data & Information

D7.1 - Update asset inventory, hierarchy and including data stewardship and registry. Ongoing data management thereafter.

A common asset data register will define which asset attributes will be collected for which assets. These data requirements will be tailored to support the City's future asset management activity needs. The register should also indicate what level of data quality is required, and who is responsible for the data. This opportunity will require the review of asset databases and data attributes. The City will be required to develop strategies to close data gaps.

The asset register will be built, and necessary interfaces will be built into core systems.

Following development of the framework and strategy for data management in 2020, data collection and management will continue in subsequent years. The intention of the City is to have complete condition assessment information for all assets within a 5-year timeframe.

D7.4 - Provide project support for Asset Registry, work management and other AM improvements

In previous years incremental improvement may have been made to the renewal and capital budgeting process, for example through risk frameworks. This task is to develop and improve the workflow for this process including integrating updated condition data, and asset lifecycle data.

D7.5 - Validate functionality of Cityworks

The City will undertake a review to improve functionality and familiarity with Cityworks to support the asset management plan needs.   The review will validate the functionality of Cityworks, identifying to what degree the program is currently operated, and any opportunities for expansion.   Internal or external training opportunities will be reviewed based on the outcome of the Cityworks review.

D8.1 - Standardize condition rating systems for asset groups. Capture of data condition information, level of service measures.

Development of systems through which condition can be determined for major or all asset types. The condition rating systems will lay out the granularity of the condition assessment, and indicate the numerical rating scale to be used, including examples of the various condition ratings. The condition rating systems should be developed such that the ratings can be clearly understood and repeatable by staff at varying tiers within the organization.

2.2.4   Contribution to Asset Management Practice

CAM13.2 - Awareness to take place across the organization

Usage of the communication and change management plans (described further in **Section 2.7**) to disseminate asset management knowledge and awareness across City staff.   Focus of awareness communication to include relevance of Asset Management to positions across the organization, and universal buy-in and efforts required for implementation and success.

CAM13.3 - Develop training plan for asset management

Asset management training to be developed that defines the desired roles, responsibilities and competencies around the asset lifecycle for each major asset class. A skill gap analysis will be undertaken to determine the extents of the training required at the City. A development of training schedule and delivery materials will be required. It is recommended that opportunities for conducting asset management training in association with other groups be investigated, including coordination with MACA (including the Territory), and Canadian Forces (or other organizations as appropriate).

CAM14.1 - Mitigate the risk of losing information through improved record keeping

Establish a data management system (described further in **Section 2.7**) and reporting protocols for the maintenance of records. A review of gaps in data storage and record keeping should be undertaken to identify areas where improvement can be made. The strategy should consider existing software solutions and recording processes.

2.2.5   **Asset Management Practices, Processes and Procedures**

D16.1 - Develop corporate risk framework

Development of a corporate risk framework should include consideration of how risk is to be measured within the corporation. The definition of risk categories, which are recommended to be simple for ease of measurement and framework implementation, and the methodology of measuring risk should be established within an overall risk framework. Other related initiatives should be considered when developing the framework including the 2019 Public Safety Risk Review, and the Corporate Capital Planning Prioritization Criteria.

In development of the corporate risk framework, additional risk information should be consulted, such as provided in **Section 3.2** of this report.

2.3   2021 – Year Two

During Year 2 of the AM Roadmap, the condition of assets is determined with a standardized methodology, and the expected level of service in order to establish a baseline for evidence-based service and capital planning.

2.3.1   **Policy & Governance**

G1.2 - Use policy to guide actions

The approved asset management policy will be used to influence and guide asset management actions moving forward.

2.3.2   **Data & Information**

D7.1 - Ongoing data management

Continued management of asset inventory, hierarchy and registry, following initial 2020 update.

D7.4 - Provide project support for Asset Registry, work management and other AM improvements

Project support continued from process initiated in 2020.

D8.1 - Standardize condition rating systems for asset groups. Capture of data condition information, level of service measures.

Data capture continued from process initiated in 2020.

2.3.3   **Contribution to Asset Management Practice**

CAM13.4 - Update communication and change management plans

Plans developed in initial AM Roadmap and Policy update will be updated based on any organizational changes.

CAM15.1 - Staff and elected officials attend asset-management related events

Staff and officials from all levels of organizations should be considered for attendance, depending on the nature of the events. Events should be selected based on their applicability to the City's assets, and include learning opportunities from industry professionals, workshops, or other similar jurisdictions.

2.3.4   Asset Management Practices, Processes and Procedures

D17.1 - Develop template for and document current levels of service

Standardization of the levels of service across the City should occur through development of a template to record pertinent asset information. The levels of service should be as comparable as possible across the organization for consistency in decision making and asset management planning.

2.4   2022 – Year Three

While there is a continued focus on opportunities that contribute to asset management practices on-going from previous years, this is the year that a comprehensive update to the asset management plan(s) can be made using the practices and information from the preceding years.

2.4.1   Policy & Governance

G1.2 - Use policy to guide actions

The approved asset management policy will be used to influence and guide asset management actions moving forward.

2.4.2   Data & Information

D7.1 - Ongoing data management

Continued management of asset inventory, hierarchy and registry, following initial 2020 update.

D7.4 - Provide project support for Asset Registry, work management and other AM improvements

Project support continued from process initiated in 2020.

D8.1 - Standardize condition rating systems for asset groups. Capture of data condition information, level of service measures.

Data capture continued from process initiated in 2020.

D9.1 - Evaluate opportunity definition after AMP update

Once the AMP has been updated, any gaps in the quality or completeness of data will be apparent, and opportunity tasks created to close any gaps as necessary.

2.4.3 Planning & Decision Making

PD10.1 - Develop categories for standard reporting of strategies to manage asset needs, e.g. maintenance, rehab, replacement

For efficiency in the planning and decision making process, a series of strategies to manage assets should be developed to address needs throughout the lifespan of each asset. Comparisons during planning and decision making can be done efficiently with similar language used across asset types and defined strategies.

2.4.4 Asset Management Practices, Processes and Procedures

D18.1 - Update AMPs using new data, risk, and other improved AM practice results

A formalized asset management plan will be written, documenting current and future levels of service, state of assets, risk exposure, optimal renewal strategies, and long range financial planning. The asset management plan will be approved by Council, and is to be updated on a 3-5 year basis.

2.5 2023 – Year Four

During year four of the AM Roadmap, a focus is to build on the data and information to provide additional direction regarding lifecycle requirements. Further, additional planning works are recommended to be undertaken. Master planning is undertaken to complete the picture of service and asset requirements integrating the AMPs with the planning exercise. Work continues on developing AMPs across all City assets and enhancing those completed with validated asset strategies.

2.5.1 Policy & Governance

G1.2 - Use policy to guide actions

The approved asset management policy will be used to influence and guide asset management actions moving forward.

2.5.2 Data & Information

D7.1 - Ongoing data management

Continued management of asset inventory, hierarchy and registry, following initial 2020 update.

D7.2 - Define lifecycle investment requirements

Asset data and formalized level of service information previously gathered will be reviewed in consideration of the City's intended level of service to determine the lifecycle investment required to maintain each asset network. This process will feed into future budgeting considerations.

D7.3 - Evaluate risks and lifecycle investments

In association with completion of Opportunity D7.2, the risk of the lifecycle investments is to be evaluated for each asset network. The risk will consider implications of not maintaining the desired level of service due to funding shortcomings or condition of assets.

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D7.4 - Provide project support for Asset Registry, work management and other AM improvements

Project support continued from process initiated in 2020.

2.5.3 Planning & Decision Making

PD11.1 - Prepare Master Plans to determine system expansion requirements in context of current asset performance

Asset management incorporates information from other key documents at the City. For example, development of master plans will provide information regarding anticipated future plans for the City. Future planning will provide additional detail for asset management planning, including any implications on asset risk, level of service or condition based on anticipated future conditions.

2.5.4 Asset Management Practices, Processes and Procedures

D18.1 - Update AMPs using new data, risk, and other improved AM practice results

Update continued from process initiated in 2022.

2.6 2024 – Year Five

The last year of the AM Roadmap sees a shift towards maintenance improvements, and the implementation of the Roadmap is reviewed, and recalibrated based on new information. There is continued focus on implementation of asset management practices, processes and procedures. The opportunities described as part of Year Five are intended to occur for a duration of two years, extending into 2025.

2.6.1 Policy & Governance

G1.2 - Use policy to guide actions

The approved asset management policy will be used to influence and guide asset management actions moving forward.

2.6.2 Data & Information

D7.1 - Ongoing data management

Continued management of asset inventory, hierarchy and registry, following initial 2020 update.

D7.4 - Provide project support for Asset Registry, work management and other AM improvements

Project support continued from process initiated in 2020.

2.6.3 Asset Management Practices, Processes and Procedures

D18.3 - Adopt mobile data collection for direct upload to Cityworks

Implementation of a data collection system that integrates a mobile interface with Cityworks for front-line staff to remotely input asset condition information efficiently. Staff training to be designed and performed, and mobile collection equipment to be acquired as necessary.Opportunity continues into 2025.

2.7   Supporting Plans

2.7.1   Communication Plan

A communication plan is a tool that will be implemented through all stages of this Roadmap, and will outline communication protocols and strategies for disseminating asset management information through the corporation and stakeholders.

Recommendations for communication include divisional led internal staff meetings to disseminate asset management Roadmap information and asset management concepts. A webpage can be created for FAQ on asset management, including a link to the approved AM Roadmap document.

2.7.2   Change Management Plan

A change management plan is a tool that will be used to guide the evolution of asset management in the City. The plan can be formulated to manage all aspects of the change, including budget, timeline and resources through the change process.

Activities that have been undertaken, and are encouraged to continue in support of change management include:

- Formation of a cross-representative working group to lead asset management
- Securement of Council endorsement through reports to Council on asset management
- Implementation of the communication strategy to introduce the Roadmap across the City in divisional-lead meetings

2.8   Costs and Resources

The implementation of the Roadmap will use resources from the City and external sources. Estimates have been developed regarding the estimated quantity of internal and external resources and associated costs for each of the opportunities outlined in the Roadmap. A summary of the required resources and costs is included in **Table 3**, and a detailed breakdown of estimates by opportunity is included in *Appendix B.*

Table 3: Summary of Costs and Resources with Roadmap Implementation

Year	Total Resources	Total Cost	External		City	
			Resources (Days)	Costs	Resources (Days)	Costs
2019	96	$ 59,298	14	$ 16,440	82	$ 42,858
2020	444	$ 382,181	222	$ 265,500	222	$ 116,681
2021	464	$ 368,206	186	$ 222,300	278	$ 145,906
2022	409	$ 352,494	205	$ 245,700	204	$ 106,794
2023	552	$ 510,976	328	$ 393,557	224	$ 117,419
2024	524	$ 475,887	299	$ 357,843	225	$ 118,044
2025	457	$ 412,762	257	$ 307,843	200	$ 104,919
TOTAL	2942	$2,561,803	1508	$1,809,183	1434	$ 752,620

3.0 Implementation Strategies

3.1 Organizing for Asset Management

3.1.1 Structure

The City has a significant capital asset portfolio, and thus a structured and consistent approach to asset management is needed to coordinate and prioritize infrastructure spending. In addition, the Federal and Territorial governments require comprehensive Asset Management plans for Federal Gas Tax funding, and potentially for future application-based funding. Organizing to deliver asset management services will ensure the City determines the required and optimized funding for infrastructure needs and continues to qualify for existing and potential grant funding. This is a demonstrable benefit arising out of an asset management program.

The current structure includes formation of an asset management working group. AM initiatives are supported and delivered through informal task teams, the AM Roadmap as an example, made up of representatives from each department. Advantages of this model is a higher level of engagement and representation of all Departments in AM strategic and tactical decision making, and no new hires or FTEs are needed for AM. Disadvantages of this model are a perceived absence of AM authority and sponsorship, lengthier implementation times for AM initiatives because accountability is divested with many groups / individuals, a lack of consistency in how AM processes and practices are being applied across service groups, and slower adoption of change or implementation of asset management.

To overcome the disadvantages of the current structure, ideally some form of dedicated management responsibility will provide direction and ensure consistency across the organization.

Typical structures for asset management include *oversight* by a cross sector asset management function or group, *management* through a centralized role or less ideally distributed across departments, and *delivery* of the practices and program at the department level.

3.1.1.1 Oversight

To provide guidance, direction and feedback for the Asset Management Program. The primary accountability is for the Asset Management Policy and Asset Management Strategy.

3.1.1.2 Management

Provide leadership for the asset management program, provide assistance to department stakeholders who are responsible for delivery of asset management. Accountable for overarching frameworks, asset management plans, and resource analysis to support asset management. Facilitates the work of the asset management committee (AMC), and communicates the strategic direction established by the AMC.
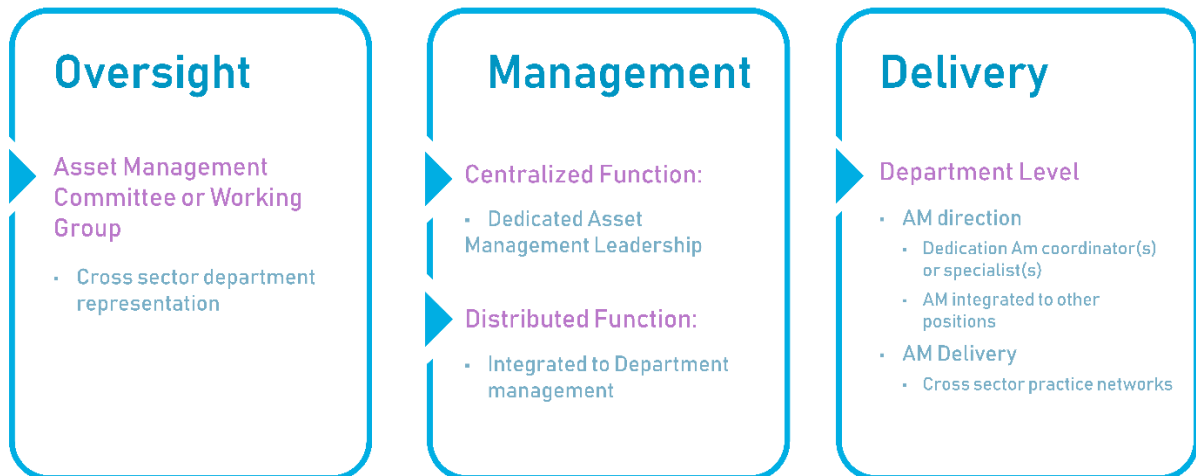
Figure 3:   Organization Oversight, Management and Delivery

3.1.1.3   **Work Management**

Utilizes the existing staff complement and augmented as required over time for formal decentralized departmental delivery and coordination. Guidance is provided by the Management function, and by formally trained AM practitioners embedded in the various departments. Implementation of the AM program, AM strategy, Roadmap, etc., is supported by practice networks (or task teams) with appropriate members selected from any of the departments.

3.1.2   **Recommendation**

The recommended approach for the City is to continue with the current ***oversight*** AM Working group, and to formalize membership, mandate and responsibilities.

Management responsibility should be provided by developing a specific Manager position that encompasses asset management. A high degree of authority is required to manage across Departments. This position can be created by a new full time equivalent permanent position (PFT) that ideally would report to Corporate Services. This reporting structure would help avoid the tendency to preferentially develop asset management in a division silo, e.g. if reporting to Public Works focusing on PW assets.

At the department level, responsibility would be assigned to a single manager, with other ***delivery*** responsibilities distributed to specific department positions (e.g. condition assessment, asset strategy, capital budget).

Additional technical support to the departments can be provided with a new permanent position, the Manager, Asset Management. . This would be an asset management specialist, coordinator or analyst to help alleviate current resourcing issues.

Technology support should continue from the IT Division, and the resources required considered against the development of the AM program and roadmap. For example supporting the deployment of mobile solutions for work management, enhancing the data registry, and enhancing the use of Cityworks.

3.2   Risk Management

The Public Safety department is undertaking the development of a risk management framework according to ISO 31000. This initiative is an ideal opportunity to expand the scope of the framework to include risk measurement for all corporate risk including to the asset management system/ program. However, the scope of the initiative is more closely focused on risk and levels of service for the Department. As such expanding the scope to encompass a broader corporate risk framework would be significantly more work.

For best practice in asset management, the resulting assessment framework needs to address risks and opportunities related to all levels of Asset Management:

1)   Council
2)   Customer/Stakeholder
3)   Assets
4)   Services

The risk framework should include specific criteria used to assess criticality that can be drawn from and employed at the practice level by department staff. In addition, the City already has an approach to evaluate capital opportunities across the departments (weighted criteria) to optimize decisions. The methodology and framework for the assessment of risks should consider and align with this decision-making tool.

The classic determination of risk score is calculated as the product of the consequence of failure multiplied by the probability of failure multiplied by the risk redundancy factor. Risk score is often divided into bands to facilitate decision-making or risk treatments.

Probability of Failure	Consequence of Failure				
	Very Low	**Low**	**Medium**	**High**	**Very High**
Very Low	Very Low	Very Low	Low	Medium	Medium
Low	Very Low	Very Low	Low	Medium	Medium
Medium	Low	Low	Medium	High	High
High	Medium	Medium	High	High	Very High
Very High	Medium	Medium	High	Very High	Very High

Figure 4: Risk Factors

Consequence of failure (CoF) is the effect of the failure on operation, function or functionality, or status of an event or asset. Similar to failure probability, consequence of failure can be expressed qualitatively or quantitatively. IIMM categorises CoF into three (3) categories (the triple bottom line) as follows:

- Social consequences (e.g. loss of service)
- Environmental consequences (e.g. atmospheric pollution)
- Economic consequences (e.g. repair cost)

An example of how capital projects may be prioritized considering type is given in the following table.

Table 4: Capital Project Prioritization Considering Risk

Project Type	Capital Program	Characteristics	Prioritization Factors	Weighting Factors
Existing Asset Renewal				
Rehabilitation and Replacement	Renewal of Assets	Maintain functionality and reliability of existing infrastructure	Business Risk Exposure as a product of: • Consequence of Failure • Probability of Failure	• Regulatory compliance • Health and safety • Operating risk • Cost of Failure
Infrastructure Augmentation				
New Regulatory Requirements	Regulatory	Regulatory and health standard compliance	• Legislative mandates and consequences	• Regulatory Requirements • Timing
Development	Growth	Provide new infrastructure to serve new developments	• Master Plans • Economic Opportunities • Timeliness	• Developer commitments • Timing • Economic Impact
Performance Improvement				
Infrastructure Improvement	Strategic Initiatives	Enhance existing infrastructure to improve efficiency or service levels	• Return on Investment • Enhanced services • Strategic alignment	• Return on Investment • Levels of Service • Operating risk • Public Confidence • Efficiency
O&M Improvement	Strategic Initiatives	Projects which enhance O&Ms ability to manage infrastructure efficiently	• O&M resource efficiency • Knowledge retention • Reporting • Decision making • Sustainability	• Regulatory compliance • Health and Safety • Operating risk • Public Confidence • O&M efficiency

3.3 **Training**

It is important for any organization to stay current with training and skills development. As asset management practices at the City mature, the personal growth and development of the team will be necessary to support the asset management roadmap.

The Canadian Network of Asset Managers (CNAM) is currently developing a skills matrix for asset management, which will identify what skills and knowledge are required to deliver competent asset management practices. It is recommended that the City review the skills matrix once published by CNAM and utilize this information to develop a training plan for the team.

The Federation of Canadian Municipalities (FCM) is supporting asset management capacity building through the Municipal Asset Management Program (MAMP). There are current training programs and courses available through MAMP at the introductory level as well as more advanced training. Additional programs are anticipated later in 2019 or early 2020.

In developing the training program for asset management, the City should consider the following:

- Awareness: Provide overview and awareness training across the organization, including Council.
- Application: Overview and Principles of Asset Management for staff directly involved in implementing asset management.
- Specialization: Topics such as risk management, levels of service may be required for key staff who will lead these areas for the City and required at a deeper level of understanding and application of specialized skills.

Appendix A
Current State Technical Memo

MEMO

TO: Sharolynn Woodward, Director, Corporate Services
Katherine Macdonald, Manager, Financial Services

FROM: Darla Campbell, P.Eng., Project Manager

DATE: July 8, 2019

SUBJECT: City of Yellowknife Asset Management Roadmap – Current State Technical Memo

OUR FILE: 19-9880

Current State Technical Memo

The first component in the development of the City of Yellowknife's (City) Asset Management Roadmap is the Discovery Phase, to establish the current state by conducting a gap analysis and assessing the City's current asset management status. The Current State Technical Memo is the deliverable from the Discovery Phase.

The Discovery Phase was undertaken through desktop exercise, on-site demonstrations and an internal stakeholder assessment questionnaire that was reviewed in working sessions with each department. Attached to this memo are the following documents, which provide additional detail regarding the steps undertaken and results of the current state tasks:

- Attachment A - Current State of Asset Management and Gap Analysis Slide Presentation
- Attachment B - Asset Management Readiness Assessment – Results Summary Table
- Attachment C - Asset Management Readiness Assessment – Summary of Gaps

Background

The City has previously undertaken asset management initiatives, but has not achieved a comprehensive and forward-looking system that suits their needs. The current state of asset management and gap analysis assesses the existing asset management framework at the City (i.e. current state of operation), and identifies areas of potential improvement.

The assessment process was initiated with the review of asset management documentation currently developed by the City. The information found in the documentation was expanded upon through dialogue with the City through targeted interviews with staff responsible for elements of asset management delivery. The interviews included discussion on assets managed by the department and services delivered, rating asset management readiness and current level of implementation. The interviews were followed by the Vision Workshop which was used to identify the envisioned asset management future of the City, and provide dialogue regarding current practices and opportunities.

Approach

An asset management Maturity Assessment is the process of measuring asset management capability against standards and/or best practices. It is a tool to identify the current state of practice and helps to determine the needs between current and desired practice.

It forms a preliminary step in an overall process to help develop a strategy and a roadmap to build on and improve the practice of asset management, as shown in **Figure 1**.
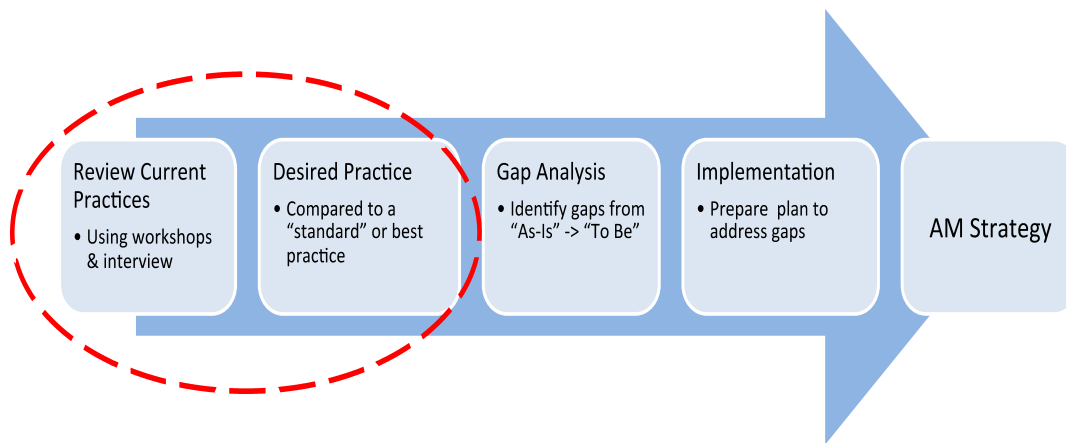
Figure 1: Process in Development of an AM Strategy

Most assessment tools are based on standards and best practice in asset management including ISO55000, PAS55, and the IIMM. Most utilize a 1 to 5 scale to measure state of practice maturity against various asset management practice areas, where 1 is for those organizations just starting out, and 5 is considered beyond the ISO Standard. The maturity level scale is shown in **Figure 2**.
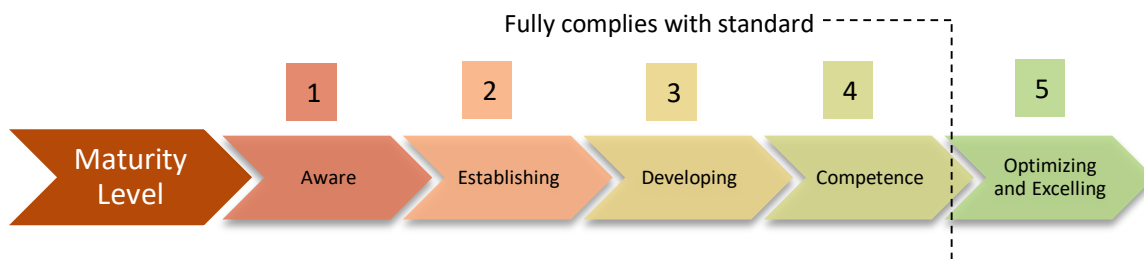
Figure 2: Measurement of Maturity Scale

The Federation of Canadian Municipalities (FCM) has developed the Municipal Asset Management Program (MAMP) which includes an Asset Management Readiness Scale (AMRS) for the purpose of helping municipalities understand the required competencies to advance asset management in their communities which supports making informed decisions about infrastructure investment. An excerpt of the FCM Asset Management Readiness Scale can be found in **Figure 3**.

ASSET MANAGEMENT READINESS SCALE

Competency: POLICY AND GOVERNANCE

This competency involves putting in place policies and objectives related to asset management (AM), bringing those policies to life through a strategy and framework, and then measuring and monitoring implementation over time.

	1		2	3	4	5
	Working on Level 1 ☐	Completed Level 1 ☐	Completed Level 2 ☐	Completed Level 3 ☐	Completed Level 4 ☐	Completed Level 5 ☐
Readiness Level	We have set expectations for our AM program. We have the support we need to begin work on an AM policy.		We have drafted an AM policy and strategy and have developed a framework for our AM system.	We are using our AM policy to guide our actions. We have created a roadmap and have established performance measures.	We have a fully functional AM system. We are using performance measures to track progress and outcomes.	We are continually improving the AM system. Our AM objectives and roadmap are refined based on the evolving needs of our community.
Outcomes	You have achieved a specific readiness level when you can demonstrate the corresponding outcomes below.					
Policy and Objectives	• Senior management has committed to formalizing an AM program.		• We have drafted an AM policy. • Senior management and council have	• We are starting to use AM policy objectives to guide our actions.	• We are managing assets and services in accordance with AM policy and organizational	• We are validating and refining corporate, service and AM objectives based on the

Figure 3: Asset Management Readiness Scale - FCM Program

The Asset Management Readiness Scale helps municipalities understand where they are starting from so they can adopt business practices that support better decisions about investing in infrastructure assets like roads, buildings and waste water systems. FCM's readiness scale is a tool that can be used at all stages to identify where you can improve your asset management practices over time. The readiness scale uses a 0 to 5 scale to rate current operations for five areas of competency. The areas of competency and definitions can be found in **Table 1**.

Table 1: AMRS Focus Areas and Definitions

| Focus Area	Definition
1 -Policy and Governance	Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy or framework, and then measuring and monitoring implementation over time.
2- People and Leadership	Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from senior management and elected officials to advance asset management.
3- Data and Information	Using asset data, performance data, and financial data to support effective asset management planning and decision-making.
4 - Planning and Decision-Making	Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance (O&M) planning, and decides on budgets
5 -Contribution to Asset Management Practice	Training and staff development, sharing knowledge internally and participating in external knowledge sharing.

In addition to these five focus areas, an additional focus area was included to capture the current state for three key components of asset management practice; risk, levels of service, and asset management plans.

These components are embedded in asset management standards such as ISO5500 and included in various readiness or roadmap frameworks including AMBC 'Guide for using the Asset Management BC Roadmap', Institute of Public Works Engineering Australasia (IPWEA) 'National Asset Management Strategy', and the US Federal Highway Administration (FHWA) 'Transportation Asset Management (TAM)'.

Current State of Asset Management and Gap Analysis

Asset Management Readiness

Multiple interviews were undertaken with representatives from the City to obtain a good picture of what the organization is facing, and rating it against the Federation of Canadian Municipalities (FCM) Asset Management Readiness scale. The interviews were conducted during June 3 to 6, 2019. Interviews were conducted with each department separately, and involved review of that department's services, discussion regarding the current operation and key issues. A questionnaire was provided on which formal responses were given. Interviews were conducted with representatives from the following:

- Corporate Services
- Policy, Communications & Economic Development
- Public Works & Engineering
- Community Services
- Public Safety
- Planning & Development

The questionnaire asked each department to provide input on the five competencies (based on the FCM Asset Management Readiness Scale categories) and key components. The questionnaire included the following six competency areas:

- Policy and Governance
- People and Leadership
- Data and Information
- Planning and Decision-Making
- Contribution to Asset Management Practice
- Key Components

The competencies were further broken down into 18 asset management outcome areas, for which the City was provided definition for five levels of readiness, and each department self-assessed by providing ratings from 0 to 5 for the readiness of their department. The 18 outcome areas are included in **Table 2**.

Table 2: Asset Management Outcome Areas for Each Competency Area

Competency Areas	Asset Management Outcome Areas
Policy & Governance	1. Policy & Objectives
	2. Strategy & Framework
	3. Measurement & Monitoring
People & Leadership	4. Cross- Functional Groups
	5. Accountability
	6. Resourcing & Commitment
Data & Information	7. Asset Data
	8. Performance data
	9. Financial Data
Planning & Decision- Making	10. Documentation & Standardization
	11. Asset Investment Plans
	12. Budgets
Contribution to Asset Management Practice	13. Training & Development
	14. Knowledge Sharing – Internal
	15. Knowledge Sharing – External
Asset Management Practices, Processes, and Procedures	16. Risk Management
	17. Levels of Service (LOS)
	18. Asset Management Plan

Gap Analysis

Using the information found through document review and assessment of asset management readiness, the current state of asset management was analyzed for gaps. The analysis is organized by the AM competencies. For each competency an overall rating has been determined, and key observations have been summarized.

Areas of Competency

Policy and Governance

The FCM Competency definition for Policy and Governance is as follows:

- Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and monitoring implementation over time.

The key current state includes the following:

- Policy and objectives have been drafted but not collaboratively across the organization, nor have they been endorsed by senior management and Council. There is a high degree of informal commitment to the overall concept of asset management although not universal in all Departments.
- Most in the City do not know that a strategy with goals and objectives has been drafted. It discusses but does not include a framework - a connection of how the system of practices, processes and technology will work together to provide an output that reflects the objectives set out in the vision and goals.
- There is some mention of benefits of AM in the draft Policy; however there is no framework, nor any discussion on measuring benefits.

People and Leadership

The FCM Competency definition for People and Leadership is as follows:

- Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from elected officials to advance asset management.

The key current state includes the following:

- Working Group established with four cross organizational members. The departments represented on the Working Group are Community Services, Corporate Services, Public Safety, and Public Works.
- SAO has directed that AM be focused on, and has given approval to proceed with AM Roadmap. But there is no specific budget in place or active resource team. The Working Group is regarded as a work in progress, with some uncertainty as to what they are to work on or deploy, and the group lacks a clear and formal mandate.
- No program requirements or cost estimates for AM system have been brought forward to Council. Council is aware of AM - and has adopted an AM initiative in their Goals and Objectives, but may not fully understand resources required. With the new council last fall, each department presented and the need for an AM program was identified.

Data and Information

The FCM Competency definition for Data and Information is as follows:

- Using asset data, performance data and financial data to support effective asset management planning and decision-making.

The key current state includes the following:

- Asset data has been collected through the 2006 and 2011 studies, and through internal works. There is no defined asset hierarchy although there is a data structure in both the GIS and Cityworks. The logic behind the Cityworks configuration precedes the current staff tenure and is unknown. The level of detail captured is high level, but there is basic attribute data for many assets. Facilities likely have the lowest level of asset detail overall.

- There is no formal method used to measure asset condition or performance. Previous reports used age as a surrogate for condition, adjusted with staff knowledge where applicable. Customer complaints also drive problem identification. Inspections that are performed are more defect based - i.e. they identify if something needs to be fixed rather than a condition or performance rating. As it relates to budgets, staff knowledge is used to identify problem areas or assets.
- The Financial Services Manager consults with representatives from the appropriate departments when she prepares the capital asset additions to comply with PS3150. The granularity of PS3150 data is high, which is typical in most organizations. Finance updates the registry but without active input from the divisions responsible for capital works. Current replacement values are not up-to-date, and although there is some unit cost tracking, e.g. costs from capital contracts, this is done more for large capital projects, and hasn't been embedded in the lifecycle analysis in asset management. Lifecycle analysis requires capturing the full cost of ownership from inception to disposal of an asset including operations, maintenance and capital renewal costs. An example of a lifecycle cost analysis would be to consider the higher capital cost of increased insulation levels with a resulting lower energy cost. With respect to TCA reporting, capital costs are recorded, but are not available or used to determine the total cost of ownership. Since capital renewal is effectively a form of maintenance, tracking the cost of ownership would facilitate understanding when it is more advisable to dispose of an asset rather than continuing to invest in it.

Planning and Decision-Making

The FCM Competency definition for Planning and Decision-Making is as follows:

- Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance planning, and decides on budgets.

The key current state includes the following:

- Capital planning is becoming more formalized with the introduction of the Evaluation Matrix (criteria to rate projects across the organization). The documented asset investment needs were driven from the 2006 and 2011 studies and have since been updated through the budget process, which relies on historical data and ad hoc judgement of what is required. Budgets drive the plan, as opposed to the plan driving the budget.
- The 10 year capital plan is considered the Asset Management Plan for Gas Tax purposes. The data set is not fully complete, e.g. it's missing areas like the Fire Hall but so far this has been used satisfactorily and like most things could be improved upon. The evaluation matrix in the capital planning process is a good step towards evidence -based prioritization, but the City has not developed robust renewal need identification processes.
- The perception is that funding for maintenance and capital is less than required although the backlog has not formally been identified. The City has resisted tax increases in the recent past, and budgets have therefore been based on historical spending. Operating budget allocations are lost, if not spent in the current year, even if it is because of a lack of staff resources to get

the work done. Capital plans may be subject to political influence versus need or condition. The City has recently introduced a cross sector matrix to evaluate the needs of each department's capital requests and to prioritize projects. Ranking investment needs and areas of priorities in this fashion is a best practice. Improvement could be made by considering risk in the evaluation.

Contribution to Asset Management Practice

The FCM Competency definition for Contribution to Asset Management Practice is as follows:

- Training and developing staff, sharing knowledge internally and participating in external knowledge sharing.

The key current state includes the following:

- There is a budget allocated for training by department that is used primarily for mandatory training, e.g. license certifications. There is recognition that AM is newly introduced and requires training but no training directive has been developed.
- FCM funding enabled two staff to attend a training certification course (NAMS) which was attended by Chris Vaughn and Katherine Macdonald.
- Three staff attended the 2018 CNAM conference in Windsor, attended by Katherine Macdonald, Greg Tink and Mike Auge and this included FCM workshop.
- FCM's CNAM workshop in Ottawa in 2017 was attended by Chris Vaughn and Katherine Macdonald.
- There is no knowledge retention practice in the City except the actions taken by individuals who have staff leaving their position, e.g. PW Director knows that he has some staff leaving in the near term so he is informally working to obtain that knowledge. Anecdotally, several staff have left recently and there was minimal effort made to extract any undocumented knowledge they possessed. There hasn't been any explicit sharing of AM knowledge internally among staff.
- Individual staff have established relationships with staff of other organizations, but not related to asset management, rather in service specific areas such as Recreation.

Key Components

Key Components of asset management practice were added to the FCM competencies as follows:

- There are many practices and principles making up asset management. Of these, measuring levels of service and managing risk are two, with a third, asset management plans being important to capture the organization's state of AM and direction.

The key current state includes the following:

- The City does not have a risk framework although the Fire Division is engaged in a project to develop a Risk Management Framework according to ISO 31000: Risk Management — Principles and Guidelines.
- Levels of Service (LOS) have not been established at the customer level although there are operational LOS such as fire response time, and winter snow removal on roads. Recreation

maintains a schedule of frequency of grass cutting and other similar operational activity levels. Public Works has documented various Road, Water and Wastewater activities with some operational service levels, costs and program details. Generally service levels have not been openly shared or documented with the public or across all levels of the organization.

- A form of Asset Management Plan (AMP) was developed in 2006 (the facilities study) and in 2011 (the investment needs) but these both are out of date, and do not fully comply with the requirements of best practice for AMPs. The current 10 year financial plan serves as the current asset management plan in that it identifies some of the investments needed across the City.

Rating Summary

Methodology

As each area of competency had more than one question, the minimum score for each competency was selected for the department's self-assessment. For example, if the department self-rated as 1, 2 and 0 in the same competency, then the rating of 0 was selected as the department's score for the competency area. This methodology, consistent with the guidance provided by FCM, ensures that the maturity level of the organization is not over stated, but is limited by the element that requires the most growth.

The results of the readiness assessment questionnaire allowed for identification of current state of each department and an overall rating for the City. The summary of results can be found in tabular form in **Attachment C**. The overall ratings ranged from 0 (in Policy and Governance) to 2 (in Planning and Decision-Making).

Summary

The six competencies outlined above were given composite ratings based on information provided by the City representatives. The rating scale is from 0 to 5, and measures the state of practice maturity against the asset management practice areas. A rating of 0 or 1 is for organizations just starting out, and 5 indicates a system beyond the ISO standard. The current state ratings (2019) for the City are shown in **Table 3**.

Table 3: Current State Ratings (2019)

No.	Competency Area	Rating
1	Policy and Governance	0.0
2	People and Leadership	0.4
3	Data and Information	0.4
4	Planning and Decision-Making	2.0
5	Contribution to Asset Management Practice	0.2
6	Key Components	0.2

A detailed breakdown of the results of the readiness assessment, including elements within each focus area and its corresponding rankings can be found in **Attachment B**. A summary of the gap analysis and ratings can be found in **Attachment C**.

Asset Management Drivers

Members of the Asset Management Working Group provided input on the asset management drivers in the City. From a selection of 21 common asset management drivers, nine staff from across the City rated each on a scale of 1 to 5 from least to most important. The results were compiled to generate a ranking of all 21 drivers based on all nine staff surveys. The results of the survey are presented in **Table 4**. Standard deviation is a measure of how spread out the numbers are in the dataset (i.e. the ratings from each participant). The smaller the standard deviation, the closer the numbers are to being consistent responses.

Table 4: Asset Management Drivers

Rank	Driver	Standard Deviation
1	Customer and Stakeholder Involvement/ expectations	0.44
1	Data Management	0.67
3	Knowledge of Assets	0.73
3	Staff Skills, Experience and Retention	0.53
5	Asset Replacement/ Renewal or Ageing Infrastructure	0.87
5	Sustainability	0.71
7	Asset Maintenance	1.05
8	Capital Expenditure Reduction/Reduce Debt	1.22
8	Continuous Improvement - Internally Driven	1.12
10	Operational Efficiency	1.05
10	Risk Management - uncertainty of risk exposure	1.05
12	Service Level Improvement - customer expectation	0.67
13	Funding Limitations - Customer Willingness to pay	1.33
13	Challenges to Deliver Capital Program	1.42
15	Regulation and Compliance	1.32
16	Infrastructure Security	1.30
17	Funding Limitations - Government Subsidies	1.32
17	Mandated Long Term Asset Planning	1.41
17	Climate Change	1.22
17	Contractor/ Procurement Process	1.41
21	Ageing Workforce	1.39

Next Steps

Software Review

As part of the evaluation of the City's current asset management software and practices, we investigated the existing GIS information and model to identify any improvements. A demonstration of the asset management software was presented on May 31. 2019 and a meeting occurred on June 12, 2019 with a Dillon GIS specialist, Sarah Galloway and Greg Tink at the City. A summary of the meeting and information is provided in *Attachment D*.

Information Request

We note that additional information was required that may influence the current and upcoming project analysis and deliverables. The following two additional documents were provided:

- Copy of GL accounts: with object codes for PW, Community Services, Public Safety, Corporate Services (or IT)
- Presentation incorporating the Fire TOR for current project on risk

The following information was also requested but not available: Community Services LOS, Parks categories, schedule of services and frequencies.

Summary of Vision Workshop

The Vision Workshop was led by Dean Rurak, P.Eng. and Madison Warren on June 6, 2019 with representatives from various departments within the City to identify the future state of asset management at the City using strategic planning and visioning tools. The workshop was held at the City on June 6, 2019. Participants in the Vision Workshop included:

- Sharolynn Woodward   Corporate Services, Director
- Chris Vaughn   Public Works, Sustainability Projects Coordinator
- Ashley Rivers   Public Works, Operations Manager
- Chris Greencorn   Public Works, Director
- Wendy Alexander   Public Works, Engineering Manager
- Debbie Gillard   Administration, City Clerk
- Stephanie Lasiuk   Corporate Services, Grant Writer
- Johanna Elliot   Community Services, Facilities Manager
- Greg Tink   Corporate Services , GIS Analyst
- John Fredricks   Public Safety, Fire Chief

The workshop provided an opportunity to create dialogue regarding asset management, and to identify common key themes to help build the roadmap. The primary questions asked during the sessions included the following:

- What are we DOING now?
- Where can we improve and what are we NOT DOING?
- What are the Risks we face?

The meeting further provided opportunity for dialogue regarding visioning of the future of asset management at the City, indicating that the City is interested in meeting a set of regulated requirements, establishing a tool box with practices and techniques to manage assets, and establishing a customer centric management philosophy. Specific goals for each were identified. The workshop concluded with envisioning the asset management program at 10 years in the future, identifying the program steps required to achieve the intended future program.

The key discussion points and findings from the visioning workshops can be found in Slides 22-27 of *Attachment A*.

Closing

Completion of the Discovery Phase creates a foundation on which the Asset Management Roadmap will be built. Through the Discovery Phase, input and discussions from the City provided the Dillon team with a comprehensive understanding of the state of asset management at the City, and allowed for analysis of gaps and opportunities. The City also provided their vision of the future of asset management through the Visioning workshop. The results of this phase will be used going forward to create a roadmap suited to the needs and requirements of the City.

Attachment A

Current State of Asset Management and Gap Analysis Side Presentation

CITY OF YELLOWKNIFE
Asset Management Roadmap
RFP 19-028

Current state of asset management and
gap analysis

HOW WE GOT HERE

How did we get here?

Select chronology

YEAR	ACTION
2006	City Contracts FSC Engineers to do an Infrastructure Gap Analysis
20XX	The City submits the TCA, an accounting exercise related to asset management
2011	Dillon is contracted to do an Infrastructure Needs Assessment
2017	City joined FCM's Climate and Asset Management Network (CAMN)
2017	Staff completed the FCM Asset Management Readiness Scale
2017	Directors completed the FCM Climate Adaptation Maturity Scale
2018	City begins drafting AM policy and strategy
2019	City initiates an AM Roadmap

Purpose of the roadmap

§   The City's objective is to conduct a gap analysis that identifies where existing data, software and practices are adequate and where they fall short, and then to develop a roadmap that addresses the results of the gap analysis and outlines an achievable progression for advancing its asset management practices. Specifically, the City is interested in pursuing best practices in lifecycle cost analysis, risk management and climate adaptation (which are not currently integrated into planning) that can adequately inform Council's long-term capital and financial decision making.

§   The City is looking for a roadmap to guide the City in steps to integrating asset management into the daily operation of delivering services and providing for the sustainability of that service for the long-term.

BACKGROUND

AM roadmap and vision

An effective road map is vision driven.

Before developing the road map, it's important to understand the City's long-term vision for asset management.

Typically this is done for a 5 or 10 year period.

Once established, the vision sets the direction and pace of the roadmap, which is the steps taken to move the City forward.

The roadmap is the outcome of the vision; the goals and actions that support achieving the vision.

Outcomes from asset management will influence and impact the investments the City makes in its assets, and by extension since assets support services, asset management has the potential to influence and impact the services the City delivers. In this respect developing asset management practices in the City is strategic.

How collaborative should strategic planning, and by extension asset management planning, be?

At the end of the day, key stakeholders have to agree on the final vision, and a set of objectives to align around and track priorities. When more stakeholders have input into the plan, then they are more likely to drive the implementation.

Measuring current state

§ The City, with the assistance of Dillon Consulting, undertook a gap analysis of Asset Management maturity, using the FCM self-assessment Asset Management Readiness tool as well as assessment of 3 other key asset management practices (components of Risk, Levels of Service, and Asset Management Plans).

§ The assessment comprised a review of asset management documentation currently developed by the City, and a series of targeted interviews with nominated City staff responsible for elements of asset management delivery.

§ The gap analysis resulted in a 0 to 5 maturity score for the City in the 5 Asset Management "capability elements" covered by the FCM guide and measured for 4 Departments.

§ This technical memorandum details the approach and findings of the Gap Analysis

§ FCM's Asset Management Readiness Scale helps local governments measure progress on asset management in five competency areas. Each of these competencies is a building block. Together, the five building blocks form the practice of asset management.

§ Each level is further broken down into three outcome areas. The outcomes describe milestones in asset management from initial investigation of practices, to adoption, and, eventually, to full integration of asset management practices into daily routines. Each of these three outcome areas need to be achieved before a level has been achieved.

The values in each block represent the City's overall average score in each of the FCM competencies.
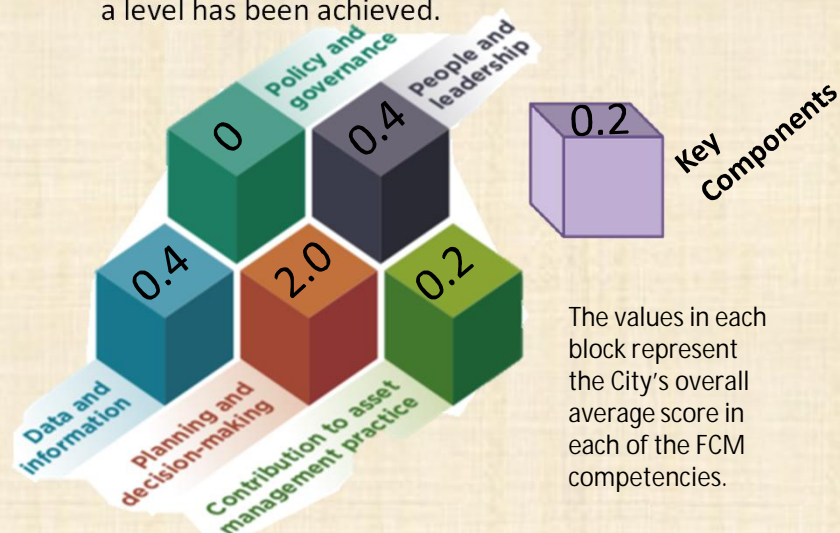
▪ The Asset Management Readiness Scale helps municipalities assess where they're at and identify the areas they need to work on. Asset management is a journey and every community will be at a different stage in terms of which competencies they have developed, and which they have not yet focused on.

How to use the FCM Asset Management Readiness Scale

For each asset management competency, there are five levels. The five levels form a progressive scale, from initial investigation to adoption and, eventually, full integration of asset management practices into daily routines. The "outcomes" described at each level show, in practical terms, what it means to be at that level.

In this example the overall score is 0 since the City is still working on a defined mandate for the AM working group, and making Council aware of the need and securing the funding for the development of the asset management program.

ASSET MANAGEMENT READINESS SCALE

Competency: PEOPLE AND LEADERSHIP
*This competency involves setting up **cross-functional groups** with clear **accountability**, and ensuring adequate **resourcing and commitment** from senior management and elected officials to advance asset management (AM).*

§ The AM working group committed to completing the AM self-assessment and roadmap
§ The AM working group does not have a defined mandate
§ Council is aware of AM, but resources for it have not been defined
§ Overall rating is a 0: Working on achieving Level 1

THE STATE OF ASSET MANAGEMENT PRACTICE

AM Readiness Interviews

Interviews with key leadership staff, knowledgeable employees, and organizational stakeholders, are key to an organizational assessment. The interviews focus on obtaining a good picture of what the organization is facing, and the rating against the FCM AM Readiness scale.

To ensure that the interviews are systematic, the interviews followed a template that started with a review of the service the Department provides, any assets within its control, and any software utilized. The template is a guide as the interview is a discussion to determine a general understanding of the current situation, and key issues.

Where applicable, this was followed by a review of the Asset Management Readiness questionnaire with formal responses to each question.

Representatives from these groups were interviewed:
§   Corporate Services
§   Policy, Communications & Economic Development
§   Public Works & Engineering
§   Community Services
§   Public Safety
§   Planning & Development

In addition a workshop to evaluate the City's asset management vision, current state, opportunities and risk was conducted.

A summary of key points of discussion includes:

§   AM has had a rocky road in the City and early studies are now older and in need of a refresh

§   Cityworks CMMS implementation is less than optimal as, except for Fleet, it is not being used to track work against individual assets, and the way Departments use it is not consistent across the City

§   Uncertainty of exactly where the City is at this point and what next steps are required

§   There is different views or disagreement on the maturity of practice in the City, for example levels of service for Public Works was considered comprehensive by external stakeholders, and lacking detail by internal stakeholders.

§   In general there is a perceived lack of alignment between Departments/Divisions in terms of knowledge and practice

A summary of the discussions held with the Department is provided in the appendices.

AM Readiness results

The City of Yellowknife
Asset Management Readiness Assessment
June 6, 2019

		2017 Rating	Community Services	Public Works	Corporate Services	Public Safety		Department average level attained
						Fire & Emergency Service	Municipal Enforcement	
Policy and governance		0	0	0	0	0	0	0
Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and monitoring implementation over time.	Policy & Objectives		0	1	1	0	0	0.4
	Strategy & Framework		0	1	0	0	0	0.2
	Measurement & Monitoring		0	0	0	0	0	0
People and leadership		0	0	0	0	1	1	0.4
Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from elected officials to advance asset management.	Cross- Functional Groups		1	0	1	1	1	0.8
	Accountability		0	0	1	1	1	0.6
	Resourcing & Commitment		1	0	0	1	1	0.6
Data and information		3	0	1	1	0	0	0.4
Using asset data, performance data and financial data to support effective asset management planning and decision-making.	Asset Data		3	2	2	3	2	2.4
	Performance data		2	1	2	2	1	1.6
	Financial Data		0	2	1	0	0	0.6
Planning and decision-making		2	2	2	2	2	2	2
Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance planning, and decides on budgets.	Documentation & Standardization		2	2	2	2	2	2
	Asset Investment Plans		2	2	3	2	2	2.2
	Budgets		2	3	2	2	2	2.2
Contribution to asset management practice		1	0	0	1	0	0	0.2
Training and developing staff, sharing knowledge internally and participating in external knowledge sharing.	Training & Development		0	1	1	1	0	0.6
	Knowledge Sharing - Internal		2	0	1	2	1	1.2
	Knowledge Sharing - External		0	1	2	0	0	0.6
Key Competencies		n/a	0	0	0	1	0	0.2
There are many practices and principles making up asset management. Of these, measuring levels of service and managing risk are two, with a third, asset management plans important to capture the organizations state of AM and direction	Risk Management		0	0	0	2	0	0.4
	LOS		3	0	1	2	0	1.2
	Asset Management Plan		1	1	1	1	0	0.8

Overall the corporation is primarily at a stage where they are working on achieving Level 1 for most Competencies and most Departments.

There are pockets of greater maturity levels including a very consistent level 2 in Planning and Decision-Making.

The full description of the evidence to support the ratings is provided in the appendices.

The following page provides a summary for each of the 5 FCM competency results, and the Key Components.

The City of Yellowknife — Asset Management Readiness Assessment

No.	FCM Competency	Rating	Current State
1	**Policy and governance** — Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and	0.0	Policy and objectives have been drafted but not collaboratively across the organization, nor have they been endorsed by senior management and Council. There is a high degree of informal commitment to the overall concept of asset management although not universal in all Departments. Most in the City do not know that a strategy with goals and objectives has been drafted. It discusses but does not include a framework - a connection of how the system of practices, processes and technology will work together to provide an output that reflects the objectives set out in the vision and goals. There is some mention of benefits of AM in the draft Policy, however there is no framework, nor any discussion on measuring benefits
2	**People and leadership** — Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from elected officials to advance asset management.	0.4	Working Group established with 4 cross organizational members. SAO has directed that AM be focused on, and has given approval to proceed with AM Roadmap. But there is no specific budget in place or active resource team. The Working Group is regarded as a work in progress, with some uncertainty as to what they are to work on or deploy, and the group lacks a clear and formal mandate. No program requirements or cost estimates for AM system have been brought forward to Council. Council is aware of AM - and has adopted an AM initiative in their Goals and Objectives, but may not fully understand resources required. With the new council last fall, each department presented and PW identified the need for an AM program
3	**Data and information** — Using asset data, performance data and financial data to support effective asset management planning and decision-making.	0.4	Asset data has been collected through the 2006 and 2011 studies, and through internal works. There is no defined asset hierarchy although there is a data structure in both the GIS and Cityworks. The logic behind City Works configuration precedes the current staff tenure and is unknown. The level of detail captured is high level, but there is basic attribute data for many assets. Facilities likely have the lowest level of asset detail overall. There is no formal method used to measure asset condition or performance. Previous reports used age as a surrogate for condition, adjusted with staff knowledge where applicable. Customer complaints also drive problem identification. Inspections that are performed are more defect based - i.e. they identify if something needs to be fixed rather than a condition or performance rating. As it relates to budgets, staff knowledge is used to identify problem areas or assets. The granularity of PS3150 data is high, which is typical in most organizations. Finance updates the registry but without active input from the divisions responsible for capital works. Current replacement values are not up-to-date, and although there is some unit cost tracking, e.g. costs from capital contracts, this is done more for large capital projects, and hasn't been embedded in the lifecycle analysis in asset management.
4	**Planning and decision-making** — Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance planning, and decides on budgets.	2.0	Capital planning is becoming more formalized with the introduction of the Evaluation Matrix (criteria to rate projects across the organization). The documented asset investment needs were driven from the 2006 and 2011 studies and have since been updated through the budget process, which relies on historical data and ad hoc judgement of what is required. Budgets drive the plan, as opposed to the plan driving the budget. The 10 year capital plan is considered the Asset Management Plan for Gas Tax purposes. The data set is not fully complete, e.g. it's missing areas like the Fire Hall but so far this has been used satisfactorily and like most things could be improved upon. The evaluation matrix in the capital planning process is a good step towards evidence -based prioritization, but the City has not developed robust renewal need identification processes. The perception is that funding for maintenance and capital is less than required although the backlog has not formally been identified. The City has resisted tax increases in the recent past, and operating budgets have therefore been based on historical spending. Operating budgets are lost if not spent in the current year, even if it is because of a lack of staff resources to get the work done. Capital plans may be subject to politics versus need or condition. The City has recently introduced a cross sector matrix to evaluate the needs of each department's capital requests and to prioritize projects. Ranking investment needs and areas of priorities in this fashion is a best practice. Improvement could be made by considering risk in the evaluation.
5	**Contribution to asset management practice** — Training and developing staff, sharing knowledge internally and participating in external knowledge sharing.	0.2	There is a budget allocated for training by department that is used primarily for mandatory training, e.g. license certifications. There is recognition that AM is newly introduced and requires training but no training directive has been developed. FCM funding enabled two staff to attend a training certification course (NAMS) and a total of four staff to attend the 2017 and 2018 CNAM conferences. There is no knowledge retention practice in the City except the actions taken by individuals who have staff leaving their position, e.g. PW Director knows that he has some staff leaving in the near term so he is informally working to obtain that knowledge. Anecdotally, several staff have left recently and there was minimal effort made to extract any undocumented knowledge they possessed. There hasn't been any explicit sharing of AM knowledge internally among staff. Individuals have sector specific contacts such as Recreation, but have not established connections to share asset management information.
6	**Key Components** — There are many practices and principles making up asset management. Of these, measuring levels of service and managing risk are two, with a third, asset management plans important to capture the organizations state of AM and direction	0.2	The City does not have a risk framework although the Fire Division is engaged in a project to develop a Risk Management Framework according to ISO 31000: Risk management — Principles and guidelines. Levels of service have not been established at the customer level although there are reportedly operational LOS such as Fire response time, and winter snow removal on roads. Recreation maintains a schedule of frequency of grass cutting and other similar operational activity levels. Generally service levels have not been openly shared or documented. A form of asset management plan was developed in 2006 (the facilities study) and in 2011 (the investment needs) but these both are out of date, and do not fully comply with the requirements of best practice for AMPs. The current 10 year financial plan serves as the current asset management plan in that it identifies the investments needed across the City.

ASSESSMENT OF CITY DOCUMENTS

Draft Asset Management Policy

ISO 55000: 5.2 Policy

Top management shall establish an asset management policy that:

a) is appropriate to the purpose of the organization;

b) provides a framework for setting asset management objectives;

c) includes a commitment to satisfy applicable requirements;

d) includes a commitment to continual improvement of the asset management system.

The asset management policy shall:

1) be consistent with the organizational plan;
2) be consistent with other relevant organizational policies;
3) be appropriate to the nature and scale of the organization's assets and operations;
4) be available as documented information;
5) be communicated within the organization;
6) be available to stakeholders, as appropriate;
7) be implemented and be periodically reviewed and, if required, updated

International Infrastructure Management Manual (IIMM): 2.1.2 Developing Asset Management Policy

The AM policy or strategy should include specific objectives related to:

§ AM Structure, roles and responsibilities
§ Risk management
§ Delivery of services to the standard agreed with stakeholders
§ Statutory compliance
§ Stakeholder consultation
§ Preparation of AM Plans
§ Continuous review and improvement of AM processes
§ Implementation of improvement plans for AM systems, data and processes

City's draft AM Policy

The City's draft AM Policy addresses a majority of topics considered necessary in best practice.

Notable exceptions are highlighted in red, with orange representing an element that is partly addressed.

Most significantly, the policy outlines Council responsibilities but none for City staff who should be charged with developing, managing and improving the asset management program/system.

In addition the policy has not been developed in consultation with stakeholders nor endorsed by senior management and Council.

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Draft Asset Management Vision and Strategic Goals

ISO 55000: 6.2 Asset management objectives

When establishing its asset management objectives, the organization shall consider the requirements of relevant stakeholders and of other financial, technical, legal, regulatory and organizational requirements in the asset management planning process.

§ The asset management objectives shall:
§ be consistent and aligned with the organizational objectives;
§ be consistent with the asset management policy;
§ be established and updated using asset management decision-making criteria (see 4.2);
§ be established and updated as part of the SAMP;
§ be measurable (if practicable);
§ take into account applicable requirements;
§ be monitored;
§ be communicated to relevant stakeholders;
§ be reviewed and updated as appropriate.

The organization shall retain documented information on the asset management objectives.

Global Forum on Maintenance & Asset Management

The Asset Management Strategy describes the long-term approach to management of the physical assets. It would typically include a set of strategic statements that describe the current and future service levels the organization is planning to deliver and the current and future Asset Management capabilities that the organization needs in order to sustainably deliver these outcomes. The Asset Management Strategy would typically include:

§ Asset management objectives that include measurable objectives on the expected economic, environmental and social performance of an organization's asset portfolio.
§ Key accountabilities for activities of Asset Management Strategy and implementation and ongoing maintenance of it.
§ The decision-making criteria that are used to undertake lifecycle cost and risk analysis to determine the optimum asset interventions,
§ How the organization will develop its asset information to support such analysis and manage uncertainty associated with asset information
§ A reference to the overall Asset Management System including a description of how it fits into the AM management system.
§ The methodology for determining asset and network criticality.

City's draft AM vision and strategic goals

The City's draft document has alignment with the draft AM Policy and covers much of best practice requirements.

Notable exceptions are highlighted in red, with orange representing an element that is partly addressed.

Like the policy it has not been developed with stakeholders nor widely circulated

The topics covered are addressed more as the 'what' of AM as opposed to the 'how'. For example outlining that the City be proactive with respect to risk, but not describing how risk is measured.

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Public Works Service Standards

Street Sweeping

§ Remove gravel from pavement in summer

§ To reduce dust levels to standard outlined in the "NWT Ambient Air Quality Standards"

§ 30-50km per 12-hour shift per unit

§ After April 15th (average daily high not above 0°C until April 20th)

§ Snow removal operations have ceased

§ Traction sand is no longer being applied

§ 3 Sweepers; 6 Operators; 1 Mechanic as required

§ This is the activity description

§ This is a performance measure or LOS

§ Expected production rate

§ Procedures for when the work will be performed

§ Resources that are required

This document is a mix of standard operating procedure, schedule of works, and operational service level.

Although it is not constructed in customer service terms, this example for street sweeping shows the depth of information documented.

It also does not include asset based service levels such as condition and risk triggers for asset renewal decisions.

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Fire Division Emergency Mandates and Services Delivery Levels

The Fire Division service level document is similar to Public Works providing a mix of activity information. It also includes asset details such as expected useful life of equipment and apparatus.

In addition it includes a classic view of service response rates for various events under different conditions.

Response Time within the City of Yellowknife

	Dispatch Time	Turnout Time	Travel Time	Response Time
EMS	60 seconds	60 seconds	4 minutes	6 minutes
Fire (staffed)	60 seconds	80 seconds	4 minutes	6 minutes 20 seconds
Fire (Unstaffed)	60 seconds	80 seconds	8 minutes	10 minutes 20 seconds

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CURRENT STATE – THE GOLDEN TRIANGLE

Building a roadmap – the golden △
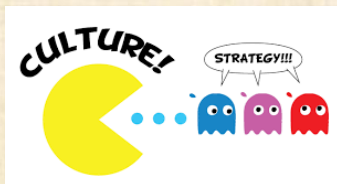
Culture

Culture eats strategy for breakfast – meaning a powerful and empowering culture is a surer route to organisational success

Developing culture is more than just having a set of values and a vision.

People

Often cited as 'who does what', it is more than just clear roles and responsibilities – e.g accountability.

Alignment with the organization's culture is critical as is upper level support.
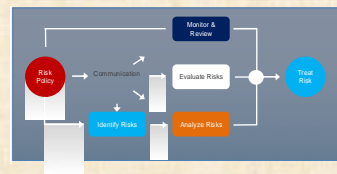
Process

Solid processes help organizations follow certain protocols and make sure that everything is "pulling" in the same direction.

When processes interact with technology, automation can scale the efficiencies gained from having clear process.

Technology …and data

Configuration, connection and mobile solutions are key. But usability becomes everything either through simplicity, training or both.

Data – captured in systems or paper records - is the building block for information, and for knowledge.

The asset management gap analysis is an exercise in strategic planning with the aim to transform the business of delivering services in the City. Any business transformation process fundamentally involves change.

The golden triangle - People, Process, Technology – is a perspective used to manage organizational change. The reason for this triangular focus comes down to one very important fact: Operational efficiency requires an approach that optimizes the relationships between people, process & technology. To the triangle we add Culture, which is necessary to win hearts as well as the minds of people, and Data as a subset of technology creating a more solid base from which to transform from the current to future state.

The use of this perspective provides a good snapshot of the current state, and a highlight of the City's needs for its AM roadmap.

Building a roadmap – the golden ▲

Culture

People

Process

Technology …and data
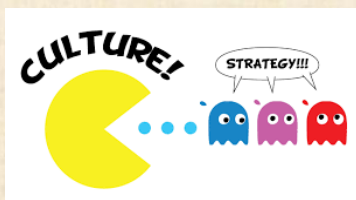
Culture is the patterns of behaviour that are encouraged, discouraged or tolerated.

Comments made about the recent workplace review found that staff feel stressed, overworked, and unsure what direction or objectives the City holds, and also concern with work-life balance.

There is some evidence of a silo environment noting the perceived lack of alignment across the City, and comments that the SAO is emphasizing the need for collaboration in decision-making.

There is some perception that Council unduly influences staff recommendations for asset improvement and spending.

Given that asset management hasn't been formally defined within the City, there is a lack of clarity among staff about asset management responsibilities and roles across the organization. A good first step has been taken by forming an AM working group, but it has no defined mandate, and there is some uncertainty about membership. An AM Policy and Strategy have been drafted, but this was done in isolation and without broad stakeholder consultation.

Many of the staff demonstrate passion for their work while also being frustrated by the lack of resources to deliver current services, or make substantial improvements. Overall investment in training appears to be insufficient.
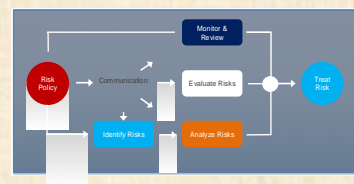
The City has recently introduced a cross sector matrix to evaluate the needs of each department's capital request and to prioritize projects. Ranking investment needs and areas of priorities in this fashion is a best practice. Improvement could be made by considering risk in the evaluation.

Development of design standards is planned, which will improve project delivery. There is a disconnect in PS3150 reporting and the capital process, and inconsistency in capture of unit costs for renewal cost estimating.

Asset renewal decisions are largely based on staff knowledge and 'gut' feelings, rather than measured asset performance.

The City has several key, well-managed software applications; FMW capital budgeting, ESRI GIS inventory, and Cityworks for maintenance management. Cityworks is not used by Community Services, and inefficiently by Public Works. Data is entered manually into Cityworks primarily by an administrator and the process and lack of resources is seen as a key obstacle. Mobile applications are not in place.

The quality of asset data is quite variable with most noting that it is only at a high level that it is captured. Assets in facilities have not been inventoried but overall Roads, Water, Wastewater and piped Stormwater assets are well described including attribute data.

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CITY'S VIEW OF CURRENT STATE

WORKSHOP ON VISION FOR ASSET MANAGEMENT

SWOT Assessment

DOING (Strengths) What are we already doing about Asset Management?	IMPROVE (Weaknesses) Where can we improve?
NOT DOING (Opportunities) What are we not doing that we should consider in the Asset Management?	RISKS (Threats) What are the risks?

SWOT is a primary tool used to facilitate discussion during a Strategic Planning Session.

The participants were divided into three groups with each addressing asset management in the City from three perspectives:

§ What are we DOING now?

§ Where can we improve and what are we NOT DOING?

§ What are the Risks we face?

The advantage of SWOT assessment is the dialogue created and identifying common, key themes to help build the roadmap.

This is followed by an exercise to create a vision for the future by taking a future perspective and 'looking back' to where you had been.

What we are DOING now?
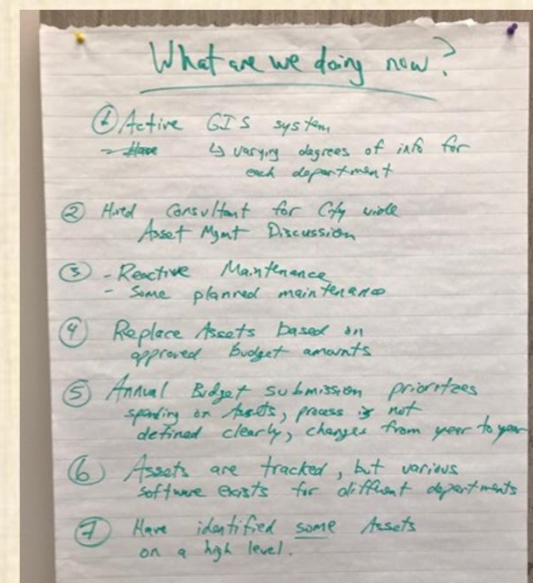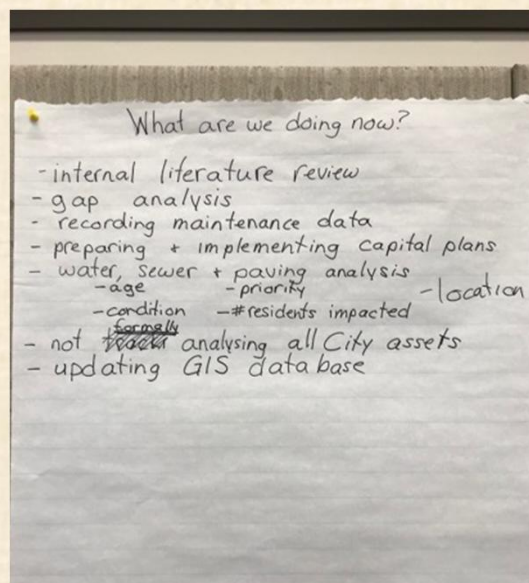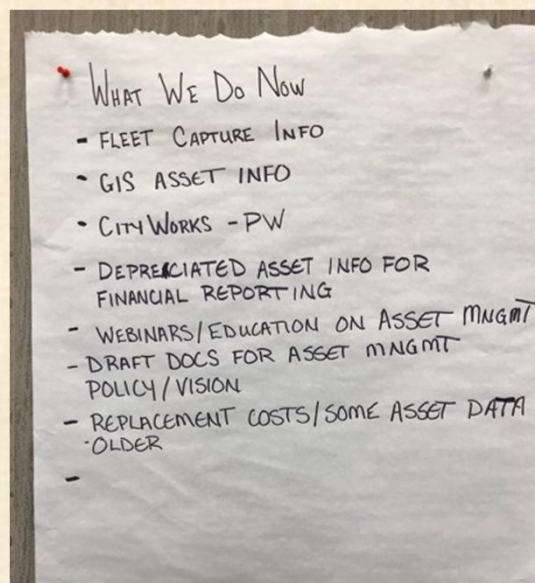
Discussion: City has a maintenance budget, but it isn't adequate, and it's not a replacement budget. There is a loss of funding if you don't have the man power in a year to accomplish work.. but work still needs to be done. Budget process for managing assets is not defined clearly but is somewhat in place. Cityworks implementation was less than optimal leading to data and process gaps – now recording maintenance data to see voids and how we can collect that data or what processes should change. Knowledgeable staff who can be resources for AM. Assets may not be well tracked, but also not enough staff to track assets well. Preparing and implementing capital plans.. but sometimes focused on politics vs need or condition. Water & sewer paving analysis based on employee knowledge, location, age, anecdotal condition data. Community services doesn't directly use city works because they don't have the admin staff to deal with data entry.

What could we improve and what are we NOT DOING

Need to improve staff retention – City is a feeder to other organizations and can't compete with mine salaries. Recent initiative with the SAO to address culture at the City, found people were stressed, overworked, and don't know what direction they're going. Work life balance is an issue in the City - 50% of staff actively think about working elsewhere. if staff had a better understanding of what they are working toward they would be more invested and feel more appreciated.
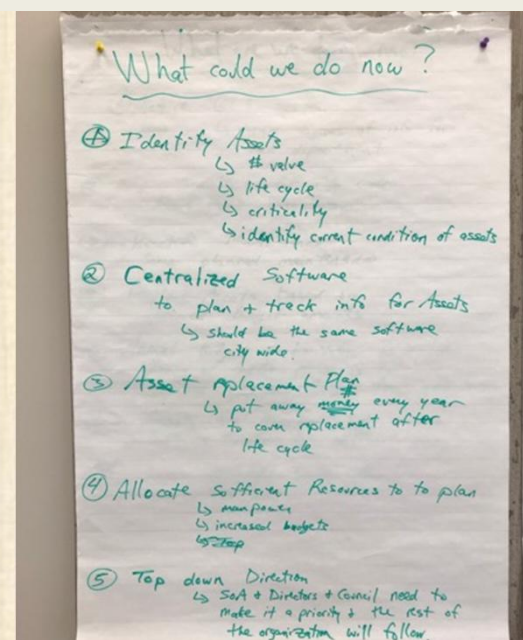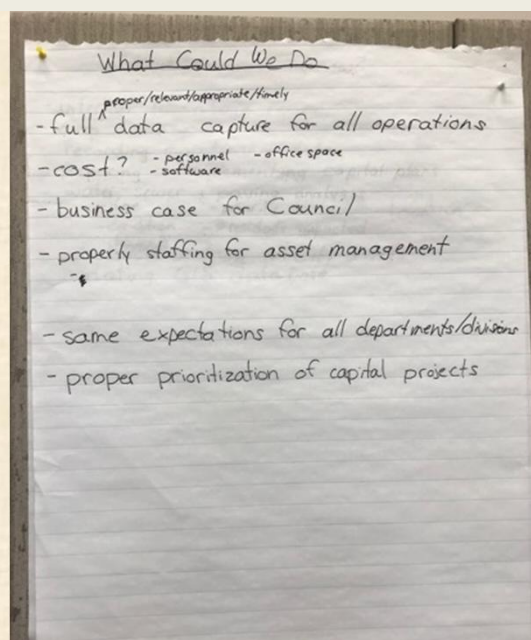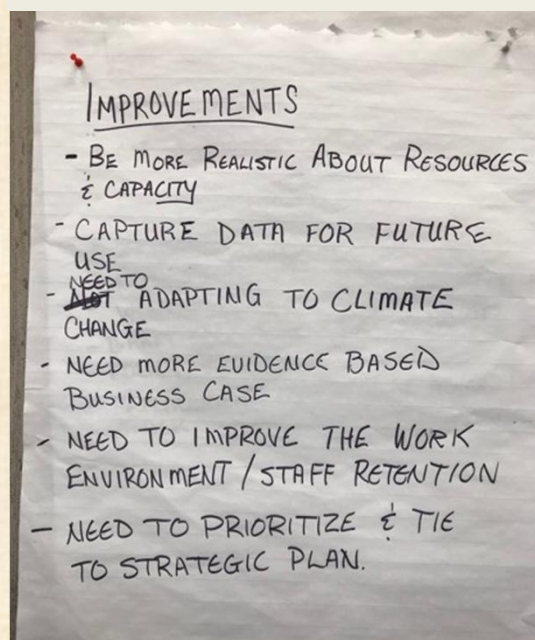
The SAO is the champion for AM and also need an operational champion(s). Be more realistic about resources/capacity. Capture data for future use, for planning - need more evidence instead of gut feeling. Increase staff in proportion to increased LOS and greater task time – H&S requirements have doubled time for confined space/ traffic control activities. Space planning for new staff as there is limited office space. Need an overall solid business case for council and need to deflect interference better. Bring everybody on board so it is an easy smooth process and mindset/thinking changes.

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What are the Risks?
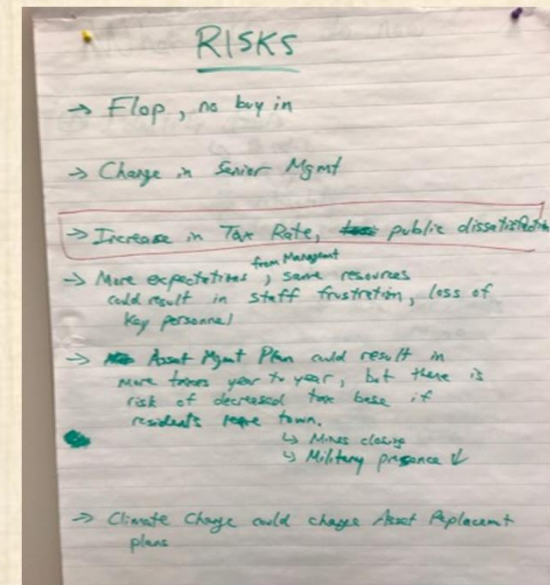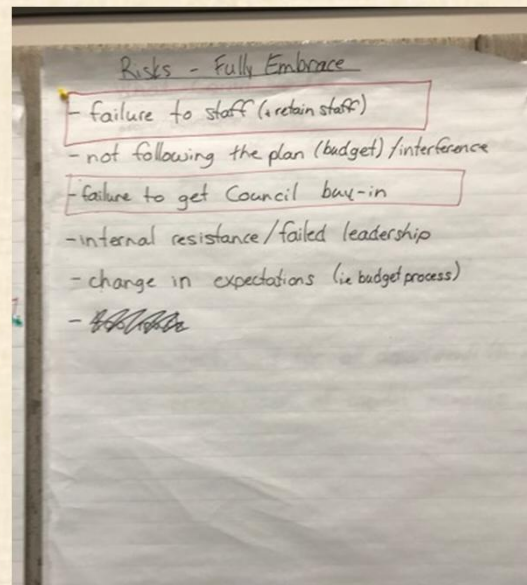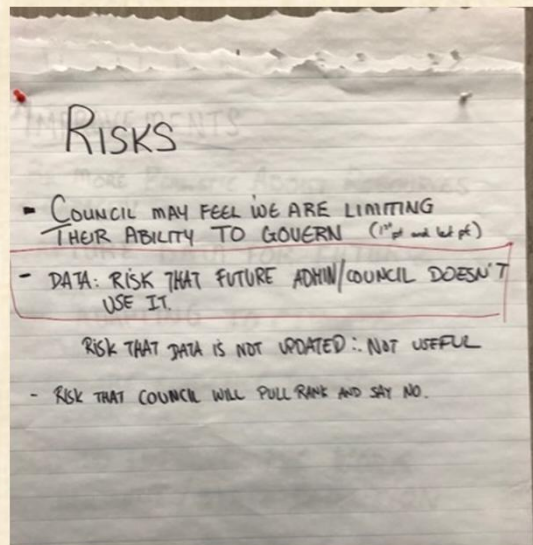
Discussion: With a solid AM plan, staff turnover, even if it continues, won't have the same effect on operations; knowledge is built into the AM system. AM in the long-term will result in saving but how long term and can this reduce tax increase sticker shock? If AM promises cost reduction and we are already underfunded, would savings from AM lead to even further underfunding. Greatest challenge to achieve is initial and continued Council buy-in.

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What do you want asset management to be?

1	**3**	**5**

Meeting a set of regulated requirements

- Follows from PSAB legislation, asset management plan to qualify for gas tax funding, and pending legislation for asset management planning and levels of service.
- Focus is on meeting requirements by documenting what is, rather than reflecting what will be or could be.

Technology and tools

- Technology and a tool box with practices and techniques to manage the assets. An asset centric approach with focus on condition, and in a mature program extending to include risk.
- Outcomes typically measured by the improvement in capital and financial plans.

A management philosophy

- Customer centric focus on service delivery, and adoption of asset management as an integral part of performance management, rather than a bolt-on 'extra' for the purpose of managing assets.
- Integrated cross sector organizational alignment of assets, asset activities and non-asset activities.

Discussion: Ideally the City would do everything included in level 1, 3 and 5. Although 3 is easier to implement than 5, if everyone is on board with 5, it is an easier transition; If everyone is on board with a 5 then the City will get to a 5. The SAO has indicated that AM should inform decisions, which can be achieved for capital at a level 3, and although achieving 3 will require some focus on alignment, and integration with all lifecycle activities, it will be peripheral to the focus of level 3: better capital planning

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Take the Temperature

q Where are you IN THE FUTURE on the Asset Management Maturity scale and your AM Structure?

Future State	Aware	Establishing	Competence	Enterprising	Excelling
	The organization is aware of the importance of AM and is starting to apply this knowledge	The organization is developing its AM activities and establishing them as Business As Usual	The organization's AM activities are developed, embedded and are becoming effective	The organization's AM activities are fully effective and are being integrated throughout the business	The organization's AM activities are fully integrated and are being continuously improved to deliver optimal whole life value

Participants expressed a keen desire to achieve the highest level of practice. There is belief that as a smaller, more flexible organization it should be possible to get to the highest level more easily than larger more siloed organizations. However, the challenges with resources will be a major factor in achieving higher levels and the pace to get to that point.

Looking back on AM from the FUTURE

A point 10 years in the future (2029) was selected when a long-term asset management plan guides the budget process requiring nominal review by Council, with a fully integrated system providing evidence-based decisions using high quality data. A key milestone at the halfway point (2024) was the official adoption of the Asset Management Plan(s) achieved through inter-departmental collaboration backed by a Council fully on-board and committed to asset management. Key support comes from centralized software that has significantly helped reduce data gaps. The asset management team has well defined roles and has addressed key tenets of asset management including risk and life cycle assessments.
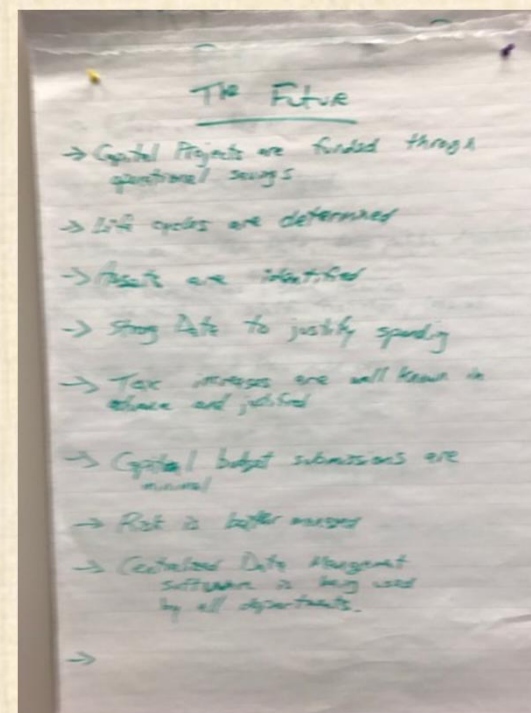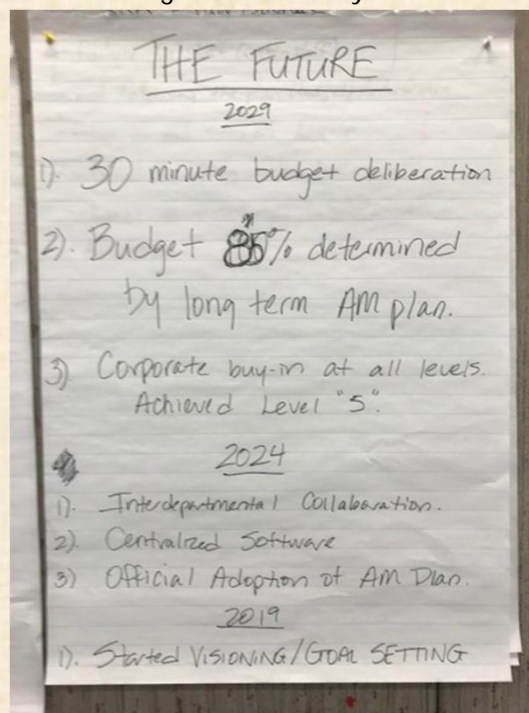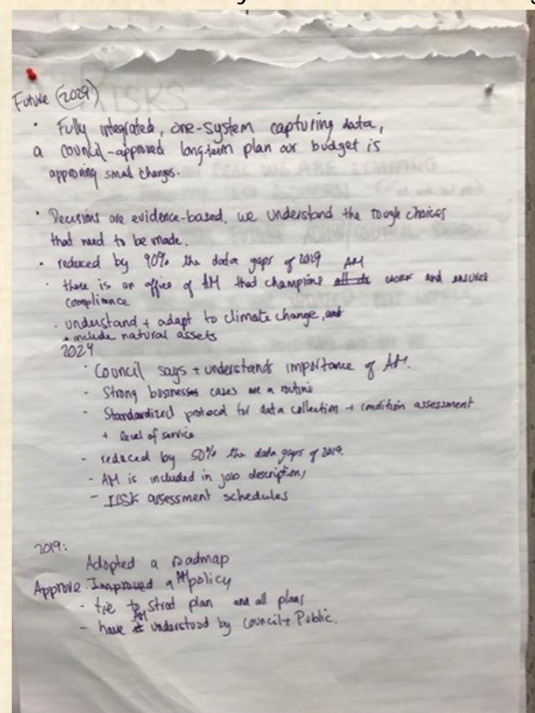
It all started in 2018/19 with the development of key asset management documents, and roadmap. The initial program steps were conducted with the efforts of staff across the City within adequate budget allocations and operational plans including judicious use of grant funding for asset management. All this was brought forward to Council and the public who accepted and endorsed the direction that demonstrated alignment to the Council Goals and Objectives, and the benefits that would accrue from an investment in funding and resources for asset management.

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Attachment B

Yellowknife AM Current State Gap Analysis-V1.0 c1

The City of Yellowknife								Asset Management Readiness Assessment						

Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
1	Policy & Governance	Policy & Objectives	Senior management has committed to formalizing an AM program.	• We have drafted an AM policy. • Senior management and council have endorsed the AM policy.	We are starting to use AM policy objectives to guide our actions.	We are managing assets and services in accordance with AM policy and organizational objectives.	We are validating and refining corporate, service and AM objectives based on the evolving needs of our community.	0	1	1	0	0	0.4	Policy and objectives have been drafted but not collaboratively across the organization, nor has it been endorsed by senior management and Council. There is a high degree of informal commitment to the overall concept of asset management although not universal in all Departments.
2	Policy & Governance	Strategy & Framework	We have drafted a basic set of objectives that will guide the development of our AM system.	We have completed the strategy and framework for our AM system.	We have established a roadmap to guide the detailed actions surrounding our AM strategy deployment.	We are achieving our AM policy objectives through a fully functional AM system. Necessary workflows, documents and reporting tools are in place. We are updating our roadmap to address evolving needs.	We are following our roadmap in continually improving the AM system and in documenting the improvements.	0	1	0	0	0	0.2	Most in the City do not know that a strategy with goals and objectives has been drafted. It discusses but does not include a framework - a connection of how the system of practices, processes, technology will work together to provide an output that reflects the objectives set out in the vision and goals
3	Policy & Governance	Measurement & Monitoring	We have defined the expected AM system benefits and outcomes.	We have documented our AM system plans and our objectives for the coming year.	We have established performance measures to monitor AM system progress and its outcomes and benefits to our community.	We are using performance measures to monitor progress and AM system outcomes and benefits.	We are monitoring performance and using the feedback to prioritize and make ongoing refinements and improvements.	0	0	0	0	0	0.0	There is some mention of benefits of AM in the draft Policy, however there is no framework, nor any discussion on measuring benefits
4	People & Leadership	Cross- Functional Groups	We have appointed resources to investigate our community's AM requirements and to define and introduce an appropriate AM system.	We have formed a cross-functional AM team* to guide and oversee AM system planning and deployment.	The AM team* works within our organization to lead, communicate and support AM improvement and change management.	Our AM team* has been made permanent and tasked with guiding and supporting the AM function across the organization on an ongoing basis.	The AM team* guides and supports the ongoing improvement of the AM system within the organization.	1	0	1	1	1	0.8	Working Group established with 4 cross organizational members.
5	People & Leadership	Accountability	Appointed resources have been mandated to investigate and assess our AM needs planning, documented by a draft terms of reference.	Our AM team* has been made accountable for guiding AM development, with a documented mandate and terms of reference.	Our AM team* has been made accountable for AM implementation and we have added AM system roles and responsibilities to staff job descriptions.	We have operationalized AM system roles and responsibilities across our organization.	We are documenting changes to AM system roles and responsibilities as needed to support our evolving requirements.	0	0	1	1	1	0.6	SAO has directed that AM be focused on, and has given approval to proceed with AM Roadmap. But there is no specific budget in place or active resource team. The Working Group is regarded as a work in progress, with some uncertainty as to what they are to work on or deploy, and the group lacks a clear and formal mandate.
6	People & Leadership	Resourcing & Commitment	Council is aware of the resourcing and funding dedicated to exploring AM system requirements and to proposing an AM roadmap.	Council demonstrates buy-in and support for AM and has approved funding for priority improvements.	Council champions AM as a core business function and has approved funding to continue AM roadmap activities.	Council has approved funding for ongoing AM system monitoring and enhancement.	The AM team measures and monitors progress. Council is committed to ongoing improvement of the AM system.	1	0	0	1	1	0.6	No program requirements or cost estimates for AM system have been brought forward to Council. Council is aware of AM - and has adopted an AM initiative in the strategic plan, but may not fully understand resources required. With the new council last fall, each department presented and PW identified the need for an AM program

The City of Yellowknife
Asset Management Readiness Assessment
June 6, 2019

The City of Yellowknife								Asset Management Readiness Assessment							
Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
7	Data & Information	Asset Data	We have pooled inventory data, including approximate quantities of assets within most asset groups.	We have basic inventory data for most major assets, including information on general asset properties such as size, material, location and installation date.	We have basic inventory data for all assets. We have defined life cycle investment requirements for some assets.	We have expanded inventory data, and have evaluated the relative risks and life cycle investment requirements associated with major assets.	We have expanded inventory data and have evaluated the relative risks and life cycle investment requirements associated with most assets.	3	2	2	3	2	2.4	Asset data has been collected through the 2006 and 2011 study, and through internal works. There is no defined asset hierarchy although there is a data structure in both the GIS and Cityworks. The logic behind the software setup precedes the current staff tenure and is unknown. The level of detail captured is high level, but there is basic attribute data for many assets. Facilities likely have the lowest level of asset detail overall.
8	Data & Information	Performance data	We have informal or anecdotal approaches for measuring asset condition or performance. Some age information exists.	We have some information on asset condition and performance for major assets, collected from a variety of sources.	We use standardized condition rating systems for most asset groups. Some level of service measures have been defined and data has been captured.	We have defined and measured levels of service for most assets. We have introduced basic needs forecasting and risk management strategies for most assets.	We have completed needs forecasts and risk management strategies for most assets.	2	1	2	2	1	1.6	There is no formal method used to measure asset condition or performance. Previous reports used age as a surrogate for condition, adjusted with staff knowledge where applicable. Customer complaints also drive problem identification. Inspections that are performed are more defect based - i.e. they identify if something needs to be fixed rather than a condition or performance rating. As it relates to budgets, staff knowledge is used to identify problem areas or assets.

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The City of Yellowknife									Asset Management Readiness Assessment				
Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
9	Data & Information	Financial Data	We have financial data on our assets, supporting minimum PS-3150 reporting requirements.	We have captured capital and operating expenditure data for some assets. We have developed a strategy to link AM and financial information.	We have captured capital and operating expenditure data for most assets. We have linked AM and financial information for all major assets.	We have calculated the cost of service delivery for all major assets. We have developed a long-term (at least 10-year) financial plan.	We understand the trade-offs between investment and the quality of the front-line services we deliver and we use this to refine our financial plans.	0	2	1	0	0	0.6	The granularity of PS3150 data is high, which is typical in most organizations. Finance updates the registry but without active input from the divisions responsible for capital works. Current replacement values are not up-to-date, and although there is some unit cost tracking, e.g. costs from capital contracts, this is done more for large capital projects, and hasn't been embedded in the lifecycle analysis in asset management.

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The City of Yellowknife								Asset Management Readiness Assessment							
Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
10	Planning & Decision-Making	Documentation & Standardization	Our approach to asset investment planning varies across the organization.	• Our departments follow a similar but informal asset investment planning approach. • We evaluate investment needs and priorities based on a mix of structured and ad-hoc practices and criteria.	• We have developed a structured asset investment planning approach but application is inconsistent. • We set priorities using similar criteria based on organizational goals and objectives.	• We employ our structured asset investment planning approach across our core services. • We set priorities using criteria which are fully aligned with our organizational goals and objectives.	• We employ our structured asset investment planning approach across all services. • We adapt our planning approach and criteria to align with evolving organizational goals and objectives.	2	2	2	2	2	2.0	Capital planning is becoming more formalized with the introduction of the Evaluation Matrix (criteria to rate projects across the organization). The documented asset investment needs were driven from the 2006 and 2011 studies and have since been updated through the budget process, which relies on historical data and ad hoc judgement of what is required. Budgets drive the plan, as opposed to the plan driving the budget.
11	Planning & Decision-Making	Asset Investment Plans	Our asset investment plans are typically reactive and focus on addressing basic needs (e.g. growth, regulations and known problems).	• Our asset investment plans are largely based on short-term asset, organizational and environmental issues. We do not have an AM plan.	• Our asset investment plans are based on short-term issues and priorities. We have drafted preliminary AM plans for priority services.	• Our asset investment plans are based on both short- and long-term issues and priorities. We have developed detailed AM plans for core services	• We have integrated and optimized asset investment plans. We have developed detailed AM plans for all services.	2	2	3	2	2	2.2	The 10 year capital plan is considered the Asset Management Plan for Gas tax purposes. The data set is not fully complete, e.g. it's missing areas like the fire hall but so far this has been used satisfactorily and like most things could be improved upon. The evaluation matrix in the capital planning process is a good step towards evidence -based prioritization, but the City has not developed robust renewal need identification processes.

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Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
12	Planning & Decision-Making	Budgets	We prepare annual capital and operating budgets which are based on historical values. We deal with new needs reactively, as they occur.	• We prepare annual capital and operating budgets which are based on a mix of historical values and new priorities.	• We prepare an annual capital budget which is based on a fresh reassessment of current needs. Our operating budget is based on a mix of historical values and new priorities.	• We prepare annual needs-based capital and operating budgets which are based on a fresh reassessment of risks and current needs.	• We prepare multi-year needs- based capital and operating budgets which are based on our short- and mid-term needs. We take a structured approach to addressing in- cycle changes.	2	3	2	2	2	2.2	The perception is that funding for maintenance and capital is less than required although the backlog has not formally been identified. The City has resisted tax increases in the recent past, and budgets have therefore been based on historical spending. Budgets are lost if not spent in the current year, even if it is because of a lack of staff resources to get the work done. Capital plans are subject to influence (Councilor neighbourhood) versus need or condition. The City has recently introduced a cross sector matrix to evaluate the needs of each department's capital request and to prioritize projects. Ranking investment needs and areas of priorities in this fashion is a best practice. Improvement could be made by considering risk in the evaluation.
13	Contribution to Asset Management Practice	Training & Development	• Our AM training and development approach is informal and largely driven by the personal initiative of staff. • Some staff conduct targeted research, seeking out basic information on AM concepts and techniques.	• Our AM training and development requirements are defined by management based on short- term needs. • Selected staff are trained on basic AM concepts.	• We provide all our staff with basic AM awareness training. • Some staff undergo training on advanced AM concepts specific to their roles and responsibilities.	• We have defined AM knowledge and skill requirements, and a training plan is in place for all positions. • Management and staff receive role-appropriate AM training to establish needed capacity across the organization.	• We train select staff members as internal experts to support the ongoing development of organizational capacity. • Proactive, role-based training serves as a support for career development and succession planning.	0	1	1	1	0	0.6	There is an budget allocated for training by department that is used primarily for mandatory training, e.g. license certifications. There is recognition that AM is newly introduced and requires training but no training directive has been developed. FCM funding enabled two staff to attend a training certification course (NAMS) and two attended the CNAM conference.
14	Contribution to Asset Management Practice	Knowledge Sharing - Internal	• We are mitigating the risk of losing information held in the minds of long- term staff, through improved record keeping.	• We have mitigated the risk of losing information held in the minds of long- term staff, through improved record keeping.	• A culture of knowledge sharing is taking root internally, supported by official initiatives. Our organization maintains AM knowledge resources (e.g. manuals, training, software). • We communicate the benefits of AM internally.	• There is a culture of knowledge sharing supported by official and informal initiatives. We maintain and disseminate AM knowledge resources (e.g. manuals, training, software).	• Knowledge is captured and flows freely throughout the organization. Staff are leveraging internal and industry knowledge and leading practice resources.	2	0	1	2	1	1.2	There e is no knowledge retention practice in the Town except the actions taken by individuals who have staff leaving their position, e.g. PW Manager knows that he has some staff leaving in the near term so he is informally working to obtain that knowledge. Anecdotally, several staff have left recently and there was minimal effort made to extract any undocumented knowledge they possessed. There hasn't been any explicit sharing of AM knowledge internally among staff.
15	Contribution to Asset Management Practice	Knowledge Sharing - External	• We are in the process of investigating industry groups and resources.	• Staff or elected officials have attended AM- related events.	• We are members of one or more AM organizations and actively participate in industry events.	• We are actively involved in AM organizations and present at industry events. We have shared information with our peers on our experience, innovations and lessons learned.	• We are a thought leader within the industry. We are active in coaching others to improve the overall body of knowledge. • We communicate the benefits of our AM program to the public.	0	1	2	0	0	0.6	Individuals have sector specific contacts such as Recreation, but have not established connections to share asset management information.

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Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
16	Asset Management Practices, Processes, and Procedures	Risk Management	The organization does not provide a documented risk management process throughout the asset life cycle.	There is not a formal documented risk management process in place, but the organization has plans to formally document all relevant processes and procedures and has already commenced this activity.	The organization has a framework to measure Risk across the Corporation and is in the process of documenting the identification and assessment of asset related risk across the asset lifecycle, but it is incomplete or there are inconsistencies between approaches and a lack of integration.	Identification and assessment of asset related risk across the asset lifecycle is fully documented. Risk management process covers almost all types of risk within its risk assessments.	Identification and assessment of asset related risk across the asset lifecycle is fully documented. The organization can demonstrate that appropriate documented mechanisms are integrated across life cycle phases and are being consistently applied. Risk management process cover all types of risk within its risk assessments.	0	0	0	2	0	0.4	The City does not have a risk framework although the Fire Division is engaged in a project to develop a Risk Management Framework according to ISO 31000: Risk management — Principles and guidelines.
17	Asset Management Planning	LOS	The organization has not identified formal level of service. Regulatory requirements have been identified and are complied with.	Regulatory requirements and technical requirements have been identified and documented. Technical performance is measured and reported.	Customer Groups defined and requirements informally understood. Customer expectations are mostly determined based on staff opinions and compliance records and covering a range of service attributes (e.g. accessibility, affordability, efficiency, quality, quantity, reliability, responsiveness, safety, etc.). Linkage between cost and level of service is informally documented. Technical and customer performance is measured and reported for most of service attributes.	Customer Group needs analyzed. Customers are consulted on significant service levels and options for example through customer surveys. Linkage between cost and level of service is formally documented for key services and service attributes, i.e. have the ability to predict the cost through a model. Technical and customer performance is measured and reported.	Levels of service consultation strategy fully developed, for example through public consultation, and implemented. Linkage between cost and level of service is formally documented for all services and service attributes at an appropriate level of complexity depended on importance of the service, i.e. have the ability to predict the cost through a model. Levels of service are integrated to decision making and business planning. Technical and customer performance is measured and reported.	3	0	1	2	0	1.2	Levels of service have not been established at the customer level although there are reportedly operational LOS such as Fire response time, and winter snow removal on roads. Recreation maintains a schedule of frequency of grass cutting and other similar operational activity levels. Generally service levels have not been openly shared or documented.

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Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Community Services	Public Works	Corp Services	Public Safety - Fire & EMS	Public Safety - ME	Overall Average	Synopsis
18	Asset Management Planning	Asset Management Plan	The asset management plan(s) is established because it is a requirement for certain grant applications (e.g. Gas Tax Funding). It includes minimum required data and only supports capital financial activities.	The asset management plan(s) is established to identify and prioritize growth and replacement projects. For core asset groups, risks are identified and their PoF and CoF are estimated by experts. It supports capital financial and decision making activities.	The asset management plan(s) is established to identify and prioritize growth, rehabilitation and replacement projects. Deterioration curves and rehabilitation projects are identified for core asset groups. For most of asset groups risks are identified and their PoF and CoF are estimated by experts. It supports capital financial, decision making, and some maintenance activities.	The asset management plan(s) is established to support all day to day asset management activities. Operation and maintenance programs for core asset groups are determined. Deterioration curves and rehabilitation projects are identified for core asset groups. Assets risks are identified and their PoF and CoF are estimated based on historical data, and risk mitigation plans are determined. It supports operation, maintenance, financial, and decision making activities.	The asset management plan(s) is established to support all day to day asset management activities. Operation and maintenance programs for all asset groups are determined. Deterioration curves and rehabilitation projects are identified for all asset groups. Assets risks are identified and their PoF and CoF are estimated based on historical data, and risk mitigation plans are determined. It supports operation, maintenance, financial, and decision making activities.	1	1	1	1	0	0.8	A form of asset management plan was developed in 2006 (the facilities study) and in 2011 (the investment needs) but these both are out of date, and do not fully comply with the requirements of best practice for AMPs. The current 10 year financial plan serves as the current asset management plan in that it identifies the investments needed across the City.

Attachment C

Summary of Gaps

The City of Yellowknife		Asset Management Readiness Assessment		
No.	FCM Competency	Rating	Current State	
1	**Policy and governance** Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and	0.0	Policy and objectives have been drafted but not collaboratively across the organization, nor have they been endorsed by senior management and Council. There is a high degree of informal commitment to the overall concept of asset management although not universal in all Departments. Most in the City do not know that a strategy with goals and objectives has been drafted. It discusses but does not include a framework - a connection of how the system of practices, processes and technology will work together to provide an output that reflects the objectives set out in the vision and goals There is some mention of benefits of AM in the draft Policy, however there is no framework, nor any discussion on measuring benefits	
2	**People and leadership** Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from elected officials to advance asset management.	0.4	Working Group established with 4 cross organizational members. SAO has directed that AM be focused on, and has given approval to proceed with AM Roadmap. But there is no specific budget in place or active resource team. The Working Group is regarded as a work in progress, with some uncertainty as to what they are to work on or deploy, and the group lacks a clear and formal mandate. No program requirements or cost estimates for AM system have been brought forward to Council. Council is aware of AM - and has adopted an AM initiative in their Goals and Objectives, but may not fully understand resources required. With the new council last fall, each department presented and PW identified the need for an AM program	
3	**Data and information** Using asset data, performance data and financial data to support effective asset management planning and decision-making.	0.4	Asset data has been collected through the 2006 and 2011 studies, and through internal works. There is no defined asset hierarchy although there is a data structure in both the GIS and Cityworks. The logic behind City Works configuration precedes the current staff tenure and is unknown. The level of detail captured is high level, but there is basic attribute data for many assets. Facilities likely have the lowest level of asset detail overall. There is no formal method used to measure asset condition or performance. Previous reports used age as a surrogate for condition, adjusted with staff knowledge where applicable. Customer complaints also drive problem identification. Inspections that are performed are more defect based - i.e. they identify if something needs to be fixed rather than a condition or performance rating. As it relates to budgets, staff knowledge is used to identify problem areas or assets. The granularity of PS3150 data is high, which is typical in most organizations. Finance updates the registry but without active input from the divisions responsible for capital works. Current replacement values are not up-to-date, and although there is some unit cost tracking, e.g. costs from capital contracts, this is done more for large capital projects, and hasn't been embedded in the lifecycle analysis in asset management.	
4	**Planning and decision-making** Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance planning, and decides on budgets.	2.0	Capital planning is becoming more formalized with the introduction of the Evaluation Matrix (criteria to rate projects across the organization). The documented asset investment needs were driven from the 2006 and 2011 studies and have since been updated through the budget process, which relies on historical data and ad hoc judgement of what is required. Budgets drive the plan, as opposed to the plan driving the budget. The 10 year capital plan is considered the Asset Management Plan for Gas Tax purposes. The data set is not fully complete, e.g. it's missing areas like the Fire Hall but so far this has been used satisfactorily and like most things could be improved upon. The evaluation matrix in the capital planning process is a good step towards evidence -based prioritization, but the City has not developed robust renewal need identification processes. The perception is that funding for maintenance and capital is less than required although the backlog has not formally been identified. The City has resisted tax increases in the recent past, and operating budgets have therefore been based on historical spending. Operating budgets are lost if not spent in the current year, even if it is because of a lack of staff resources to get the work done. Capital plans may be subject to politics versus need or condition. The City has recently introduced a cross sector matrix to evaluate the needs of each department's capital requests and to prioritize projects. Ranking investment needs and areas of priorities in this fashion is a best practice. Improvement could be made by considering risk in the evaluation.	
5	**Contribution to asset management practice** Training and developing staff, sharing knowledge internally and participating in external knowledge sharing.	0.2	There is a budget allocated for training by department that is used primarily for mandatory training, e.g. license certifications. There is recognition that AM is newly introduced and requires training but no training directive has been developed. FCM funding enabled two staff to attend a training certification course (NAMS) and a total of four staff to attend the 2017 and 2018 CNAM conferences. There is no knowledge retention practice in the City except the actions taken by individuals who have staff leaving their position, e.g. PW Director knows that he has some staff leaving in the near term so he is informally working to obtain that knowledge. Anecdotally, several staff have left recently and there was minimal effort made to extract any undocumented knowledge they possessed. There hasn't been any explicit sharing of AM knowledge internally among staff. Individuals have sector specific contacts such as Recreation, but have not established connections to share asset management information.	
6	**Key Components** There are many practices and principles making up asset management. Of these, measuring levels of service and managing risk are two, with a third, asset management plans important to capture the organizations state of AM and direction	0.2	The City does not have a risk framework although the Fire Division is engaged in a project to develop a Risk Management Framework according to ISO 31000: Risk management — Principles and guidelines. Levels of service have not been established at the customer level although there are reportedly operational LOS such as Fire response time, and winter snow removal on roads. Recreation maintains a schedule of frequency of grass cutting and other similar operational activity levels. Generally service levels have not been openly shared or documented. A form of asset management plan was developed in 2006 (the facilities study) and in 2011 (the investment needs) but these both are out of date, and do not fully comply with the requirements of best practice for AMPs. The current 10 year financial plan serves as the current asset management plan in that it identifies the investments needed across the City.	

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		2017 Rating	Community Services	Public Works	Corporate Services	Public Safety		Department average level attained
						Fire & Emergency Service	Municipal Enforcement	
Policy and governance		**0**	**0**	**0**	**0**	**0**	**0**	**0**
Putting in place policies and objectives related to asset management, bringing those policies to life through a strategy and framework, and then measuring and monitoring implementation over time.	Policy & Objectives		0	1	1	0	0	0.4
	Strategy & Framework		0	1	0	0	0	0.2
	Measurement & Monitoring		0	0	0	0	0	0
People and leadership		**0**	**0**	**0**	**0**	**1**	**1**	**0.4**
Setting up cross-functional groups with clear accountability, and ensuring adequate resourcing and commitment from elected officials to advance asset management.	Cross- Functional Groups		1	0	1	1	1	0.8
	Accountability		0	0	1	1	1	0.6
	Resourcing & Commitment		1	0	0	1	1	0.6
Data and information		**3**	**0**	**1**	**1**	**0**	**0**	**0.4**
Using asset data, performance data and financial data to support effective asset management planning and decision-making.	Asset Data		3	2	2	3	2	2.4
	Performance data		2	1	2	2	1	1.6
	Financial Data		0	2	1	0	0	0.6
Planning and decision-making		**2**	**2**	**2**	**2**	**2**	**2**	**2**
Documenting and standardizing how the organization sets priorities, conducts capital and operations and maintenance planning, and decides on budgets.	Documentation & Standardization		2	2	2	2	2	2
	Asset Investment Plans		2	2	3	2	2	2.2
	Budgets		2	3	2	2	2	2.2
Contribution to asset management practice		**1**	**0**	**0**	**1**	**0**	**0**	**0.2**
Training and developing staff, sharing knowledge internally and participating in external knowledge sharing.	Training & Development		0	1	1	1	0	0.6
	Knowledge Sharing - Internal		2	0	1	2	1	1.2
	Knowledge Sharing - External		0	1	2	0	0	0.6
Key Components		**n/a**	**0**	**0**	**0**	**1**	**0**	**0.2**
There are many practices and principles making up asset management. Of these, measuring levels of service and managing risk are two, with a third, asset management plans important to capture the organizations state of AM and direction.	Risk Management		0	0	0	2	0	0.4
	LOS		3	0	1	2	0	1.2
	Asset Management Plan		1	1	1	1	0	0.8

Attachment D

Summary of Asset Management Software Analysis

Key Take-away(s)

- City Works asset management software is working well for the City
- Using a GIS enterprise Geodatabase/ Both Staff and Public Online mapping tools
- Collector for ArcGIS is used to collect data in the field, using a series of drop down menus
- 2 GIS users maintain the geodatabase for assets
- Public works assets are in good shape
- Use of City works to track vehicle fleets (non-spatial) most advanced asset management done at the City
- The City looks to be using City Works for all their currently tracked assets. They have not implemented the DPSS software that Dillon had provided them with in the 2011 study

GIS Staff's Concerns

- Identifying items that need to be tracked and at what level?
  - Example – Linear infrastructure (roads) are in good shape, but what about curbs? What level should these be looked at? City level? Neighbourhood level? Custom zones? Should different assets be identified at different scales? If so how do we determine this?
  - Community services – how should all assets within a park be documented? Should swing sets/fencing/benches be spatially identified?
- Identified a gap in quality assessments
- Identified a gap in the lifecycle of assets
- How to create a less intensive admin work for the asset management team
- Is there a way to dynamically integrate the data? Resourcing is hard to maintain with only two GIS full time staff, co-op students help out in the summer (sometimes) but it's hard when there is not one person dedicated to this.

Gaps Identified

- No Formal process of pulling data out of City Works, rely on non-documented information in some cases for asset information, costing etc.
- Need to add additional assets, i.e. community services
- Identify assets at different levels – Neighbourhood/zones, not all should be viewed at the city level – makes it difficult for costing
- Building maintenance is not being tracked
- Ability to do strategic modelling to be able to make big decisions
- Currently do not have a formal method of tracking quality assessments/life cycle analysis etc.
- Integrating data from AutoCad – GIS – timing of datasets from consultants to the City has a long lag time. Tabular data is being updated without its spatial component

Appendix B
Asset Management Roadmap

			SECTION A				
Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Overall Average
1	Policy & Governance	Policy & Objectives	Senior management has committed to formalizing an AM program.	We have drafted an AM policy. Senior management and council have endorsed the AM policy.	We are starting to use AM policy objectives to guide our actions.	We are managing assets and services in accordance with AM policy and organizational objectives.	We are validating and refining corporate, service and AM objectives based on the evolving needs of our community.	0.4
2	Policy & Governance	Strategy & Roadmap	We have drafted a basic set of objectives that will guide the development of our AM system.	We have completed the strategy and framework for our AM system.	We have established a roadmap to guide the detailed actions surrounding our AM strategy deployment.	We are achieving our AM policy objectives through a fully functional AM system. Necessary workflows, documents and reporting tools are in place. We are updating our roadmap to address evolving needs.	We are following our roadmap in continually improving the AM system and in documenting the improvements.	0.2
3	Policy & Governance	Measurement & Monitoring	We have defined the expected AM system benefits and outcomes.	We have documented our AM system plans and our objectives for the coming year.	We have established performance measures to monitor AM system progress and its outcomes and benefits to our community.	We are using performance measures to monitor progress and AM system outcomes and benefits.	We are monitoring performance and using the feedback to prioritize and make ongoing refinements and improvements.	0.0
4	People & Leadership	Cross- Functional Groups	We have appointed resources to investigate our community's AM requirements and to define and introduce an appropriate AM system.	We have formed a cross-functional AM team* to guide and oversee AM system planning and deployment.	The AM team* works within our organization to lead, communicate and support AM improvement and change management.	Our AM team* has been made permanent and tasked with guiding and supporting the AM function across the organization on an ongoing basis.	The AM team* guides and supports the ongoing improvement of the AM system within the organization.	0.8
5	People & Leadership	Accountability	Appointed resources have been mandated to investigate and assess our AM needs planning, documented by a draft terms of reference.	Our AM team* has been made accountable for guiding AM development, with a documented mandate and terms of reference.	Our AM team* has been made accountable for AM implementation and we have added AM system roles and responsibilities to staff job descriptions.	We have operationalized AM system roles and responsibilities across our organization.	We are documenting changes to AM system roles and responsibilities as needed to support our evolving requirements.	0.6
6	People & Leadership	Resourcing & Commitment	Council is aware of the resourcing and funding dedicated to exploring AM system requirements and to proposing an AM roadmap.	Council demonstrates buy-in and support for AM and has approved funding for priority improvements.	Council champions AM as a core business function and has approved funding to continue AM roadmap activities.	Council has approved funding for ongoing AM system monitoring and enhancement.	The AM team measures and monitors progress. Council is committed to ongoing improvement of the AM system.	0.6
7	Data & Information	Asset Data	We have pooled inventory data, including approximate quantities of assets within most asset groups.	We have basic inventory data for most major assets, including information on general asset properties such as size, material, location and installation date.	We have basic inventory data for all assets. We have defined life cycle investment requirements for some assets.	We have expanded inventory data, and have evaluated the relative risks and life cycle investment requirements associated with major assets.	We have expanded inventory data, and have evaluated the relative risks and life cycle investment requirements associated with most assets.	2.4
8	Data & Information	Performance data	We have informal or anecdotal approaches for measuring asset condition or performance. Some age information exists.	We have some information on asset condition and performance for major assets, collected from a variety of sources.	We use standardized condition rating systems for most asset groups. Some level of service measures have been defined and data has been captured.	We have defined and measured levels of service for most assets. We have introduced basic needs forecasting and risk management strategies for most assets.	We have completed needs forecasts and risk management strategies for most assets.	1.6
9	Data & Information	Financial Data	We have financial data on our assets, supporting minimum PS-3150 reporting requirements.	We have captured capital and operating expenditure data for some assets. We have developed a strategy to link AM and financial information.	We have captured capital and operating expenditure data for most assets. We have linked AM and financial information for all major assets.	We have calculated the cost of service delivery for all major assets. We have developed a long-term (at least 10-year) financial plan.	We understand the trade-offs between investment and the quality of the front-line services we deliver and we use this to refine our financial plans.	0.6

Q#	Assessment Area	Asset Management Element	Level 1: Aware	Level 2: Establishing	Level 3: Developing	Level 4: Competence	Level 5: Optimizing & Excelling	Overall Average
10	Planning & Decision-Making	Documentation & Standardization	Our approach to asset investment planning varies across the organization.	Our departments follow a similar but informal asset investment planning approach. We evaluate investment needs and priorities based on a mix of structured and ad-hoc practices and criteria.	We have developed a structured asset investment planning approach but application is inconsistent. We set priorities using similar criteria based on organizational goals and objectives.	We employ our structured asset investment planning approach across our core services. We set priorities using criteria which are fully aligned with our organizational goals and objectives.	We employ our structured asset investment planning approach across all services. We adapt our planning approach and criteria to align with evolving organizational goals and objectives.	2.0
11	Planning & Decision-Making	Asset Investment Plans	Our asset investment plans are typically reactive and focus on addressing basic needs (e.g. growth, regulations and known problems).	Our asset investment plans are largely based on short-term asset, organizational and environmental issues. We do not have an AM plan.	Our asset investment plans are based on short-term issues and priorities. We have drafted preliminary AM plans for priority services.	Our asset investment plans are based on both short- and long-term issues and priorities. We have developed detailed AM plans for core services.	We have integrated and optimized asset investment plans. We have developed detailed AM plans for all services.	2.2
12	Planning & Decision-Making	Budgets	We prepare annual capital and operating budgets which are based on historical values. We deal with new needs reactively, as they occur.	We prepare annual capital and operating budgets which are based on a mix of historical values and new priorities.	We prepare an annual capital budget which is based on a fresh reassessment of current needs. Our operating budget is based on a mix of historical values and new priorities.	We prepare annual needs-based capital and operating budgets which are based on a fresh reassessment of risks and current needs.	We prepare multi-year needs-based capital and operating budgets which are based on our short- and mid-term needs. We take a structured approach to addressing in-cycle changes.	2.2
13	Contribution to Asset Management Practice	Training & Development	Our AM training and development approach is informal and largely driven by the personal initiative of staff. Some staff conduct targeted research, seeking out basic information on AM concepts and techniques.	Our AM training and development requirements are defined by management based on short-term needs. Selected staff are trained on basic AM concepts.	We provide all our staff with basic AM awareness training. Some staff undergo training on advanced AM concepts specific to their roles and responsibilities.	We have defined AM knowledge and skill requirements, and a training plan is in place for all positions. Management and staff receive role-appropriate AM training to establish needed capacity across the organization.	We train select staff members as internal experts to support the ongoing development of organizational capacity. Proactive, role-based training serves as a support for career development and succession planning.	0.6
14	Contribution to Asset Management Practice	Knowledge Sharing - Internal	We are mitigating the risk of losing information held in the minds of long-term staff, through improved record keeping.	We have mitigated the risk of losing information held in the minds of long-term staff, through improved record keeping.	A culture of knowledge sharing is taking root internally, supported by official initiatives. Our organization maintains AM knowledge resources (e.g. manuals, training, software). We communicate the benefits of AM internally.	There is a culture of knowledge sharing supported by official and informal initiatives. We maintain and disseminate AM knowledge resources (e.g. manuals, training, software).	Knowledge is captured and flows freely throughout the organization. Staff are leveraging internal and industry knowledge and leading practice resources.	1.2
15	Contribution to Asset Management Practice	Knowledge Sharing - External	We are in the process of investigating industry groups and resources.	Staff and elected officials have attended AM-related events.	We are members of one or more AM organizations and actively participate in industry events.	We are actively involved in AM organizations and present at industry events. We have shared information with our peers on our experience, innovations and lessons learned.	We are a thought leader within the industry. We are active in coaching others to improve the overall body of knowledge. We communicate the benefits of our AM program to the public.	0.6
16	Asset Management Practices, Processes, and Procedures	Risk Management	The organization does not provide a documented risk management process throughout the asset life cycle.	There is not a formal documented risk management process in place, but the organization has plans to formally document all relevant processes and procedures and has already commenced this activity.	The organization has a framework to measure Risk across the Corporation and is in the process of documenting the identification and assessment of asset related risk across the asset lifecycle, but it is incomplete or there are inconsistencies between approaches and a lack of integration.	Identification and assessment of asset related risk across the asset lifecycle is fully documented. Risk management process covers almost all types of risk within its risk assessments.	Identification and assessment of asset related risk across the asset lifecycle is fully documented. The organization can demonstrate that appropriate documented mechanisms are integrated across life cycle phases and are being consistently applied. Risk management process cover all types of risk within its risk assessments.	0.4
17	Asset Management Practices, Processes, and Procedures	LOS	The organization has not identified formal level of service. Regulatory requirements have been identified and are complied with.	Regulatory requirements and technical requirements have been identified and documented. Technical performance is measured and reported.	Customer Groups defined and requirements informally understood. Customer expectations are mostly determined based on staff opinions and compliance records and covering a range of service attributes (e.g. accessibility, affordability, efficiency, quality, quantity, reliability, responsiveness, safety, etc.). Linkage between cost and level of service is informally documented. Technical and customer performance is measured and reported for most of service attributes.	Customer Group needs analyzed. Customers are consulted on significant service levels and options for example through customer surveys. Linkage between cost and level of service is formally documented for key services and service attributes, i.e. have the ability to predict the cost through a model. Technical and customer performance is measured and reported.	Levels of service consultation strategy fully developed, for example through public consultation, and implemented. Linkage between cost and level of service is formally documented for all services and service attributes at an appropriate level of complexity depended on importance of the service, i.e. have the ability to predict the cost through a model. Levels of service are integrated to decision making and business planning. Technical and customer performance is measured and reported.	1.2
18	Asset Management Practices, Processes, and Procedures	Asset Management Plan	The asset management plan(s) is established because it is a requirement for certain grant applications (e.g. Gas Tax Funding). It includes minimum required data and only supports capital financial activities.	The asset management plan(s) is established to identify and prioritize growth and replacement projects. For core asset groups, risks are identified and their PoF and CoF are estimated by experts. It supports capital financial and decision making activities.	The asset management plan(s) is established to identify and prioritize growth, rehabilitation and replacement projects. Deterioration curves and rehabilitation projects are identified for core asset groups. For most of asset groups risks are identified and their PoF and CoF are estimated by experts. It supports capital financial, decision making, and some maintenance activities.	The asset management plan(s) is established to support all day to day asset management activities. Operation and maintenance programs for core asset groups are determined. Deterioration curves and rehabilitation projects are identified for core asset groups. Assets risks are identified and their PoF and CoF are estimated based on historical data, and risk mitigation plans are determined. It supports operation, maintenance, financial, and decision making activities.	The asset management plan(s) is established to support all day to day asset management activities. Operation and maintenance programs for all asset groups are determined. Deterioration curves and rehabilitation projects are identified for all asset groups. Assets risks are identified and their PoF and CoF are estimated based on historical data, and risk mitigation plans are determined. It supports operation, maintenance, financial, and decision making activities.	0.8

Q#	Assessment Area	Focus	Opportunity	Priority	AMR Level	Year	Working Group	Planning	Roads	Stormwater	Water	Wastewater	Waste & Recycling	Facilities	Parks & Trails	Fire	EMS	Information Technology	Annual (See Note)	Resources	Cost	External Resources	External Costs $150	City Resources $75	City Costs	Comments
1	Policy & Governance	Policy & Objectives	G1.1 - Update AM policy consistent with best practice	High	2	2019	X													12	$ 7,920	2.4	$ 2,880	9.6	$ 5,040	Majority of time is City staff, could be supported with consultant advisory + administration. 2 workshops plus 3 days development, and 3 days Council report
			G1.2 - Use policy to guide actions	Medium	3	2020	X												Yes	0	$ -	0.0	$ -	0.0	$ -	This has no specific cost. It is embedded in 'business as usual'
2	Policy & Governance	Strategy & Roadmap	G2.1 - Update AM vision consistent with best practice	High	-	2019	X													15	$ 9,900	3.0	$ 3,600	12.0	$ 6,300	Similar to Policy, but more detail and time, say 25% more
			G2.2 - Refine and adopt through Council the AM Roadmap	High	3	2019	X													3	$ 1,575	0.0	$ -	3.0	$ 1,575	Council report plus business case
3	Policy & Governance	Measurement & Monitoring	G3.1 - Define the expected AM system benefits and outcomes	High	1	2019	X													0	$ -	0.0	$ -	0.0	$ -	Included with the AM vision document
			G3.2 - Document AM system plans and objectives for the coming year	High	2	2019	X													8	$ 4,200		$ -	8.0	$ 4,200	Each of 4 divisions develops annual plan from AM roadmap as adopted through the project and by Council
			G3.3 - Establish performance measures to monitor AM system progress, outcomes and benefits to community	Medium	3	2020	X													25	$ 27,975	22.0	$ 26,400	3.0	$ 1,575	P1: Performance measures for AM program in 2020, followed by P2: Asset measures in 2021. Level of effort is approximately: P1: $10,000, P2:$20,000
4	People & Leadership	Cross- Functional Groups	G4.1 - Define and restructure role for AM working group and AM Manager in 2020 budget process	High	2	2019	X													4	$ 2,100		$ -	4.0	$ 2,100	2-3 days development, 1 workshop with draft document reviewed by all. 1 meeting to adopt
5	People & Leadership	Accountability	G5.1 - Establish mandate and terms of reference for AM working group	High	2	2019	X													0	$ -		$ -	0.0	$ -	Included above
			G5.2 - Define the desired roles, responsibilities and competencies and add to staff job descriptions	High	3	2020	X													12	$ 12,375	9.0	$ 10,800	3.0	$ 1,575	Review competency framework, adapt RACI chart to City org structure. 3-5 day generic framework, 5-10 days specific to City. This forms the basis of the training gap analysis and training plan
6	People & Leadership	Resourcing & Commitment	G6.1 - Council buy-in and support for AM and approved funding	High	2	2019	X												Yes	0	$ -		$ -	0.0	$ -	Included in AM Policy + AM Vision + AM Roadmap + 2020 Budget process
7	Data & Information	Inventory or Asset Register	D7.1 - Update asset inventory, hierarchy and including data stewardship and registry. Ongoing data management thereafter	Med	3-4	2020			3	3	3	3	4	3	4	4	4	4	Yes	65	$ 62,644	42.3	$ 50,700	22.8	$ 11,944	9 Sectors (Vehicles = 1) Asset Hierarchy = 2 days overview, 2 days each. Stewards & data architecture = 5 days each. 65% consultant supported
			D7.2 - Define lifecycle investment requirements	Med	3	2023			X	X	X	X	X	X	X	X	X	X		0	$ -		$ -	0.0	$ -	No specific resources assigned for D7.2 and D7.3 as this will be captured in other opportunities
			D7.3 - Evaluate risks and lifecycle investments	Med	3	2023			X	X	X	X	X	X	X	X	X	X		95	$ 98,214	71.4	$ 85,714	23.8	$ 12,500	This will be evidenced in the annual capital budget that gradually improves in 2020, and more explicitly and significantly in 2021. And in 2023 developed and fully aligned and conducted after AMP D18.1. Scope like an AMP update is approximately $100K
			D7.4 - Provide project support for Asset Registry, work management and other AM improvements	Med-High		2020												X	Yes	39	$ 20,475		$ -	39.0	$ 20,475	Specific IT resources, annualized as 15% PFT
		Technology	D7.5 - Validate functionality of Cityworks	Med		2020	X													37.5	$ 33,188	20.0	$ 24,000	17.5	$ 9,188	High level needs analysis of work management software and comparison with current Cityworks software. Ideal consultant assignment for unbiased assessment, and some vendor support to confirm current implementation against best practice. 3 staff workshops plus review time
8	Data & Information	Performance data	D8.1 - Standardize condition rating systems for asset groups. Capture of data condition information, level of service measures.	Med	3	2020			2020	2021	2020	2020	2022	2021	2022	2020	2020	2021	Yes	200	$ 172,500	100.0	$ 120,000	100.0	$ 52,500	6 complex sectors, 3 simple (IT, vehicles, SW). Framework ~ $15,000. Annualized data collection is $25K per complex sector, $5k for simple. Some assessments are already completed and may need only to be more formal, e.g. sidewalks, whereas others require more effort such as CCTV. Thus these are not all new costs.
9	Infrastructure Management	Renewal Planning	D9.1 - Evaluate opportunity definition after AMP update	Med	3	2022	X													0	$ -		$ -	0.0	$ -	This will become part of business as usual and therefore no resources assigned. A specific opportunity can be evaluated at that time

Q#	Assessment Area	Focus	Opportunity	Priority	AMR Level	Year	Working Group	Planning	Roads	Stormwater	Water	Wastewater	Waste & Recycling	Facilities	Parks & Trails	Fire	EMS	Information Technology	Annual (See Note)	Resources	Cost	External Resources	$ 150 Costs	City Resources	$ 75 Costs	Comments
10	Planning & Decision-Making	Asset Strategy	PD10.1 - Develop categories for standard reporting of strategies to manage asset needs, e.g. maintenance, rehab, replacement	Low	2	2022			X	X	X	X	X	X	X	X	X	X		0	$ -		$ -	0.0	$ -	Combine with AMP update - no assigned resources
11	Planning	Demand Management	PD11.1 - Prepare Master Plans to determine system expansion requirements in context of current asset performance	Low	3	2023		X											Yes	152	$ 157,143	114.3	$ 137,143	38.1	20,000	Annualized 5 year MP cost for each of 4 sectors -Transportation, W&WW, SW, and Community. Use $200,000 each
12	Finance	Financial	see AMP (18)																		$ -		$ -	0.0	$ -	
13	Contribution to Asset Management Practice	Training & Development	CAM13.1 - Selected staff are trained on basic asset management concepts	High	2	2019	X	X	X	X	X	X	X	X	X	X	X	X		28	$ 20,478	8.3	$ 9,960	20.0	10,518	$10,000 consultant plus 1 day per 20 staff
			CAM13.2 - Awareness to take place across the organization	Med	2-3	2020	X	X	X	X	X	X	X	X	X	X	X	X		0	$ -		$ -	0.0	$ -	Incorporate as part of Communication Plan
			CAM13.3 - Develop training plan for asset management	Med	2	2020	X													10	$ 10,650	8.0	$ 9,600	2.0	1,050	Could be done internally with consultant advisory and support. About 10 days effort
			CAM13.4 - Update communication and change management plans	Med	2	2021	X													10	$ 7,275	3.0	$ 3,600	7.0	3,675	Mostly internally developed with consultant advisory and support
14	Contribution to Asset Management Practice	Knowledge Sharing - Internal	CAM14.1 - Mitigate the risk of losing information through improved record keeping	Med	2	2020	X													15	$ 14,625	10.0	$ 12,000	5.0	2,625	Part of data management strategy under D7.1. Add knowledge retention strategy assignment
15	Contribution to Asset Management Practice	Knowledge Sharing - External	CAM15 - Staff and elected officials attend asset-management related events	Low	2	2021	X													30	$ 22,500	10.0	$ 12,000	20.0	10,500	Annual training and professional development budget targeted to AM. 20 staff and Council OR bring in to the City
16	Infrastructure Management	Risk	D16.1 - Develop corporate risk framework	High	3	2020	X									Lead	Lead			40	$ 27,750	10.0	$ 12,000	30.0	15,750	Leverage Fire Division current initiative and incorporate Capital priority criteria - 9 sectors to be considered in 1 framework. 2 stakeholder workshops, 10 days development by consultant , 9 sectors x 3 days each
17	Planning	Levels of Service	D17.1 - Develop template for and document current levels of service	Med	2-3	2021			X	X	X	X	X	X	X	X	X	X		119	$ 82,813	30.0	$ 36,000	89.2	46,813	A detailed project is $50K and extensive staff time - 9 sectors at 10 days each
18	Planning	Asset Management Plans	D18.1 - Update AMPs using new data, risk, and other improved AM practice results	Med	3	2022			2022	2022	2022	2022	2023	2022	2023	2023	2023	2023		104	$ 96,875	62.5	$ 75,000	41.7	21,875	AMPs range from $60K to $250K. Typically mostly consultant resources BUT shift to 60/40 to get better buy-in
	Operations & Maintenance	Maintenance	D18.2 - Employ Cityworks for work management, and link work to assets rather than activities	Med	4	2019			X	X	X	X	X	X	2020	X	X	X		25	$ 13,125		$ -	25.0	13,125	This is a process change, plus workflow. Data entry will be ongoing
	Asset Management Practices, Processes, and Procedures	Asset Management Plan	D18.3 - Adopt mobile data collection for direct upload to Cityworks	Med	4	2024			2024	2024	2024	2024	2025	2024	2025					67	$ 63,125	41.7	$ 50,000	25.0	13,125	Mobile app could be subscription OR built OR purchased. Approximately $35K plus annual $15K. City support will be about 5 days, plus 10 staff with 2 days each for implementation

Note: Opportunities identified as Annual will recur annually through the timeframe presented within the Roadmap subsequent to their initial year. As such, the total cost will be incurred each year.

Appendix C
Annual Roadmap Opportunities

Assessment Area	2019	2020	2021	2022	2023	2024	2025
Policy & Governance	G1.1 - Update AM policy consistent with best practice						
		G1.2 - Use policy to guide actions					
	G2.1 - Update AM vision consistent with best practice						
	G2.2 - Refine and adopt through Council the AM Roadmap						
	G3.1 - Define the expected AM system benefits and outcomes						
	G3.2 - Document AM system plans and objectives for the coming year						
		G3.3 - Establish performance measures to monitor AM system progress, outcomes and benefits to community					
People & Leadership	G4.1 - Define and restructure role for AM working group and AM Manager in 2020 budget process						
	G5.1 - Establish mandate and terms of reference for AM working group						
		G5.2 - Define the desired roles, responsibilities and competencies and add to staff job descriptions					
	G6.1 - Council buy-in and support for AM and approved funding						
Data & Information		D7.1 - Update asset inventory, hierarchy and including data stewardship and registry. Ongoing data management thereafter.	D7.1 - Ongoing data management				
					D7.2 - Define lifecycle investment requirements		
					D7.3 - Evaluate risks and lifecycle investments		
		D7.4 - Provide project support for Asset Registry, work management and other AM improvements					
		D7.5 - Validate functionality of Cityworks					
		D8.1 - Standardize condition rating systems for asset groups. Capture of data condition information, level of service measures.					
				D9.1 - Evaluate opportunity definition after AMP update			
Planning & Decision-Making				PD10.1 - Develop categories for standard reporting of strategies to manage asset needs, e.g. maintenance, rehab, replacement			
					PD11.1 - Prepare Master Plans to determine system expansion requirements in context of current asset performance		
Contribution to Asset Management Practice	CAM13.1 - Selected staff are trained on basic asset management concepts						
		CAM13.2 - Awareness to take place across the organization					
		CAM13.3 - Develop a training plan for asset management					
			CAM13.4 - Update communication and change management plans				
		CAM14.1 - Mitigate the risk of losing information through improved record keeping					
			CAM15.1 - Staff and elected officials attend asset-management related events				
Asset Management Practices, Processes, and Procedures		D16.1 - Develop corporate risk framework					
			D17.1 - Develop template for and document current levels of service				
				D18.1 - Update AMPs using new data, risk, and other improved AM practice results			
	D18.2 - Employ Cityworks for work management, and link work to assets rather than activities						
						D18.3 - Adopt mobile data collection for direct upload to Cityworks	