



Infrastructure Services

Prepared for	Council-in-Committee	Report No.	IS-21-2019
Agenda Date	July 8, 2019	File No.	210101

Subject

ASSET MANAGEMENT PLAN 2019

Recommendations

THAT Council approves the Asset Management Plan attached to Report No. IS-21-2019 as Appendix "1"

Relation to Council's 2015-2018 Corporate Strategic Plan

Priority: **B: Effective, Sustainable Infrastructure**
Goal: B1: Continue to address the infrastructure gap through planned, responsible financing
Initiative: B1.2 Continuously track progress of the Asset Management Plan
B3.2 Identify and implement best practices
B4.2 Monitor government activities and take action where appropriate

List of Stakeholders

- 1) Mayor and Council
- 2) Fort Erie Residents
- 3) GM BluePlan Engineering

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Purpose of Report

The purpose of this report is to provide Council with the Asset Management Plan (AMP) for approval, developed as part of the Town's requirements to meet Ontario Regulation 588/17.

Analysis

Enacted in late 2017, O. Reg 588/17 ([Link to 588/17](#)) made under the Infrastructure for Jobs and Prosperity Act, 2015 stipulated that each municipality over a population of 25,000 is to, by July 1, 2021, develop an Asset Management Policy and Plan for core infrastructure (water, wastewater, stormwater, roads and bridges). All remaining infrastructure must have a plan in place by July 2023. Approval of the Asset Management Plan allows the Town to demonstrate conformance to regulation under the Infrastructure for Jobs and Prosperity Act, 2015.

GM BluePlan (GMBP) was retained by the Town in May, 2018 (report IS-27-2018) to undertake the requirements to develop a new asset management plan and policy on the Town's behalf for the core asset group as outlined in O. Reg. 588/17 (roads, bridges, water, wastewater and storm water) plus facilities. These group of assets (with the exception of stormwater) have very recent master plans (or similar) completed that included life cycle costing information.

Through report IS-14-2019, Council adopted a new AM Policy and Strategy as the founding pieces of a new way forward in looking after our assets. The objective of developing the Plan was to:

- Develop Community and Technical Levels of Service for each asset group;
- Compile condition data;
- Determine the state of the infrastructure;
- Develop a financial strategy to meet the short and long term desired levels of service;
- Determine staffing and software needs to properly undertake a new way of managing our assets

The draft final plan is attached as Appendix '1'.

Our proposed levels of service (LoS) are also outlined in Appendix '2'. Community LoS refer to easy to understand metrics such as the number of boil water advisories or the cost to provide service per square metre of facility space. Technical LoS examples include metrics such as breakdown of operating and capital budgets or the number of connection-days lost per year due to water main breaks compared to the total number of properties connected to the municipal system.

Our condition data is well advanced in our Facilities, Water and Roads divisions where regular performance and condition data is tracked and recorded. This is utilized for determining operating and capital needs in both short and long term time frames. We

are lacking in data for both storm and sanitary sewer systems but have begun an intensive pipe investigation program (CCTV) that will analyse and digitally record data that will feed into the Town's geographic information system (GIS). As we gather more relevant information on the state of these two asset categories, the financial requirements to bring them to a more reasonable LoS and improved condition will likely increase both the operating and capital needs of each beyond what is currently budgeted. This will be determined over the next two-three years.

From the various master plans and the work done in this project, our estimates of the aggregate asset conditions within each category are:

Asset Category	Average Condition
Roads and RoW's	Good
Water Distribution	Good
Wastewater Collection	Fair
Stormwater Collection and Disposal	Fair
Bridges & Structures	Good
Facilities	Good
Overall	Good

As the Town moves into a more data-centric asset management, staff and software will be required to administer the program. The report recommends the addition of one staff member in Infrastructure Services. This AM 'coordinator' (reporting to the Manager of Engineering; proper job description still to be developed) will ensure that reporting under the regulation and data is kept up to date across all divisions, coordinate condition surveys, help set the capital program and be the key operator of any software obtained to assist in the coordination of asset renewal. If executed properly, some of the requirements will decrease annual workload requirements in corporate services by reducing annual capital closeout exercises.

A vital component to proper asset management is continuous improvement. Staff will be producing an annual report to Council that reviews our progress in implementing the Plan as well as the suitability. Every five years, as per the legislation, the Town must formally update the plan.

This plan covers the assets noted above. By 2023, the Town must complete a plan for the remainder of our assets which include primarily fleet, fire, IT and parks.

The renewal of assets will follow a risk-based approach. Requests for substitutions will be weighed against renewal criteria and the implications of substitutions without alternative funding will be made clear to Council before a final decision is made. Council will also have the option of altering the LoS within a category. The financial impact of this request will also be able to be quantified by the AM Coordinator.

Key recommendations out of the AMP report for the Town to execute include:

- Annually updating the financial requirements based on the approved LoS;
- Implement a work order system for Roads, Water, Wastewater and Stormwater that will tie work to specific assets to capture and analyze the operation and maintenance expenditures on assets across the corporation and support the population of many advanced metrics in the LOS Frameworks;
- Update the Town's Customer Relationship Management system so that it can tie needs or issues to both a service area and specific asset;
- The Town should complete a customer satisfaction survey of the community every 5 years to understand their satisfaction of Town services, including understanding residents' satisfaction with traffic flow and the accessibility of road assets. Many of the advanced customer metrics require feedback from the public to understand how service meets their expectation. Ongoing and repetitive public survey is critical to provide consistent trending over time;
- The Town should undergo a Stormwater Master Plan Study in the near future. This Study is an ideal opportunity to collect data and develop the processes to operationalize the performance measures in the LOS Framework; and
- Once data collection has been completed for the stormwater system, a stormwater hydraulic model should be created to determine the resiliency of the stormwater network. This will support the Town in their efforts to be in compliance with O. Reg. 588/17.

Financial/Staffing Implications

As part of the Plan, a financing strategy has been developed. As a result of staff's diligence in completing recent master plans that include long term financing issues and Council's willingness to do what is right for the long-term health of our assets, most asset categories under this plan are fully funded, or have a plan and commitment to be fully funded shortly.

The previous plan was based on a run to fail approach that over estimated the cost to run the systems, and ignored mid-life maintenance practises that extend the life of assets. This plan is more realistic in that it accounts for maintenance and allows less critical assets to degrade to a lower condition before replacement while still maintaining an appropriate LoS.

The exception to the above statement is our storm and sanitary sewer systems, wherein we do not have enough data to properly estimate condition and renewal requirements. The plan recommends that there be a capital increase to the sanitary reserve of \$270,000 (this was also covered in the Wastewater Master Plan (report IS-15-2019)). This amount only covers funding required to obtain condition data, and not an actual capital improvement program. Staff are recommending an additional \$100,000 to the storm system to obtain similar data. These amounts will be brought forward in the 2020 budget for consideration and approval.

This funding commitment is shown in the following table, excerpted from the AMP:

Asset Category	Current Avg. Annual 10-Year Contribution to Reserves (\$000)	Current Avg. Annual 10-Year Gas Tax and Other Grants (\$000)	Total Current Avg. Annual 10-Year Funding (\$000)	Avg. Annual Funding to Maintain Current LOS (\$000)	Avg. Annual Infrastructure Funding Gap (\$000)
Bridges & Structures	\$370	\$650	\$1,020	\$1,020	\$0
Facilities	\$830	\$0	\$830	\$830	\$0
Roads & ROWs	\$3,050	\$480	\$3,530	\$3,530	\$0
Sanitary	\$1,630	\$0	\$1,630	\$1,900	\$270
Stormwater	\$1,430	\$0	\$1,430	\$1,530	\$100
Water	\$1,720	\$0	\$1,720	\$1,720	\$0
Total	\$9,030	\$1,130	\$10,160	\$10,530	\$370

As staff make advances in obtaining condition data on the two systems, we will recommend changes to the funding to accommodate requirements to meet our proposed LoS.

As noted above, the plan recommends the addition of one staff member to the Engineering complement. This position was approved for the 2019 budget for one half-year, and will be a full time person for 2020 onwards. We are projecting an October hire for this position.

Policies Affecting Proposal

By-law No. 90-15 adopted Council's 2015-2018 Corporate Strategic Plan. This includes; Effective, Sustainable Infrastructure that will, continue to address the infrastructure gap through planned, responsible financing; continuously track progress of the Asset Management Plan; Identify and implement best practices; and Monitor government activities and take action where appropriate.

By-law No. 89-09 adopted the Capital Asset Policy

Ontario Regulation 588/17 made under the Infrastructure For Jobs And Prosperity Act, 2017 - Asset Management Planning For Municipal Infrastructure.

By-law 78-2019 adopted the Town's newly created Asset Management Policy

Comments from Relevant Departments/Community and Corporate Partners

Staff from Infrastructure Services and Corporate Services have been instrumental in the development of the documents. Comments from other relevant departments have been included in this report, the policy and the strategy.

Communicating Results

The whole of the asset management plan when approved will be posted on the Town's website for public information.

Alternatives

Council has the option to suggest modifications to parts of the plan as they see fit. Significant staff resources have gone into the development of the documents and changes to the AMP may place the Town out of compliance with the Regulation without further investigation.

Conclusion

Developed as part of the Town's requirements to meet Ontario Regulation 588/17, the plan represents a step towards a more formalized way of addressing the Town's infrastructure requirements. These documents will form the foundation of our actions going forward.

Attachments

Appendix '1' – Asset Management Plan
Appendix '2' – Level of Service Tables

Asset Management Plan

May 27, 2019



The Corporation of
The Town of Fort Erie

EXECUTIVE SUMMARY

The Town of Fort Erie continues to make planned investments in existing infrastructure staying aware of legislative changes, future growth, and changing climate. The implementation of an Asset Management Policy, Strategy and Plan is necessary to adapt to infrastructure challenges as the Town continues to evolve.

The AM Policy articulates the Town's commitments and principles that will be considered in corporate AM planning. It ensures alignment and integration of AM into strategic planning processes.

The purpose of the AM Strategy is to determine the specific approaches that the Town will enact to link infrastructure decisions to the Town's overall priority of effective, sustainable infrastructure.

The overall purpose of the Town's AMP is to provide a comprehensive document that will guide corporate decision making related to the construction, operation, maintenance, replacement, expansion, and disposal of infrastructure assets, while minimizing risk and cost to the Town and its taxpayers and maximizing service delivery.

These strategic documents apply to assets owned by the Town of Fort Erie including:

1. Core municipal infrastructure assets:
 - Roads (including all road assets in the right-of-way)
 - Bridges
 - Culverts
 - Drinking water distribution
 - Sanitary sewage collection
 - Storm water management, and
2. Facilities Assets.

Levels of Service

Within the AMP, a comprehensive Level of Service (LOS) Framework has been developed for the AMP asset categories within the current scope. The development of performance measures that align with community values and corporate priorities and the technical indicators/metrics is a critical component on a functional Asset Management Plan. LOS are also at the core of O. Reg. 588/17 which will require municipalities to understand the cost of providing services, and to achieve higher or lower levels of service. Although this AMP has developed a LOS Framework that addresses legislated requirements, further work is required to fully develop, measure, and verify several current and proposed LOS, including several legislated performance measures.

State of Local Infrastructure

Asset information is stored in multiple locations, with GIS being the main source for inventory data. This data was combined into an asset inventory containing approximately 8,944 asset records with a total replacement value of approximately \$1 billion, given the following caveats:

- Valuations shown are predicated upon average local values for replacement of infrastructure in the absence of invoice costs or average values provided from Town Staff.
- Values shown do not reflect economies of scale with respect to the coordinated replacement of infrastructure.
- Replacement values assume replacement with modern equivalent infrastructure.
- Increase to the accuracy of these valuations and the financial plan presented will require the improvement of the Town's core infrastructure data in several key areas.

Table ES1: Asset Valuations

Service Category	Asset	Current Replacement Value
Roads & ROW	Roads	\$386,403,656
	Streetlights	\$2,406,240
	Sidewalks	\$23,326,386
Water	Mains	\$171,796,084
	Hydrants	Built into Main Costs
	Valves	Built into Main Costs
Wastewater	Sewers	\$136,003,666
	Manholes	Built into Sewer Costs
Stormwater	Sewers	\$156,184,476
	Manholes	Built into Sewer Costs
Bridges & Structures	All	\$37,350,500
Facilities Management	All	\$98,423,527
Total:		\$1,003,807,668

The average condition of all assets, weighted by replacement value was determined to be in Good condition, as illustrated in Figure ES1.

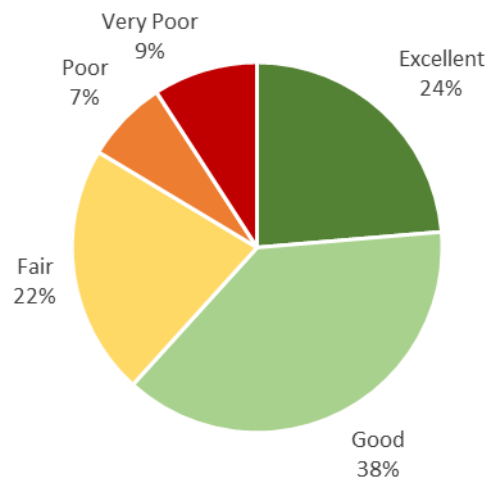


Figure ES1: Performance Breakdown for All Assets (with performance data)

Implementation Plan

An analysis of several scenarios was completed to forecast the Town's infrastructure needs and determine the required expenditures to address these needs. Asset risk was incorporated into some scenarios by establishing performance triggers for replacement based on the Consequence of Failure (COF) for different asset types.

Based on the findings of this analysis, only wastewater assets are recommended for additional spending to help maintain the state of good repair while the Town completes a CCTV inspection program. For the remainder of the asset categories, the existing budget was found to be adequate to maintain LOS. The spending projected for wastewater assets included a 3% increase per year over ten years, which would result in an increased expenditure of \$2.7M over 10 years in addition to annual inflationary increases to contributions.

Figure ES2 outlines the recommended 10-year capital plan to address the state of good repair of the assets and their resulting average weighted performance which is maintained at a "Good" performance.

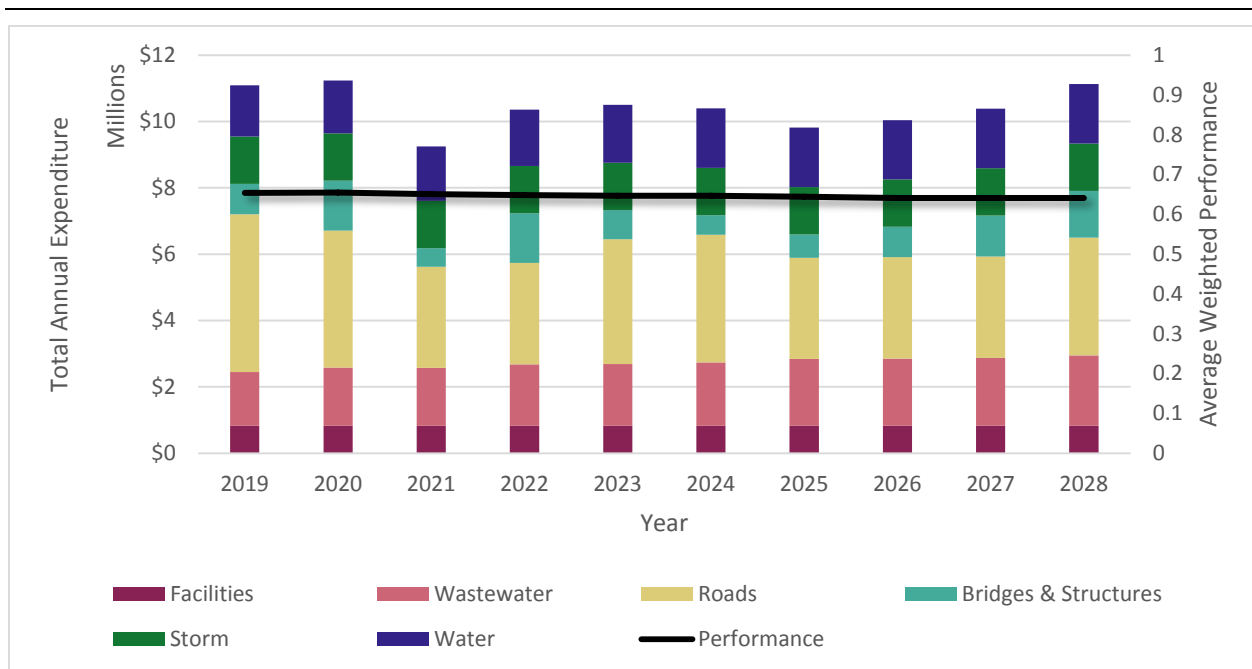


Figure ES2: Recommended 10 Year Capital Plan

Financing Strategy

The only infrastructure gap was related to water and wastewater, no gap was identified for assets funded through the Tax Levy. A 2.2% revenue increase would be required, on top of inflationary and other approved increases, to fund the additional \$420K of related capital expenditures. It should be noted that the infrastructure gap for Sanitary may change as the Town completes the CCTV inspections over the next 10-years, as recommended by the 2019 Wastewater Master Plan. These inspections will provide condition data to inform the expenditure needs rather than the current age-based analysis.

The Town has developed a Long-Term Financial Plan (LTFP) Model which is a dynamic tool that incorporates all considerations from long-term capital and operating expenditures. The LTFP Model uses conventional accounting formula to track operating revenues and expenditures, debt and debt service obligations, reserves, etc., over a 30-year planning horizon.

The LTFP Model was used to analyze two rate increase scenarios to fund the infrastructure gap:

- Scenario 1 - Close the infrastructure gap over 3-years; and
- Scenario 2 - Close the infrastructure gap over 10-years.

In Scenario 1, the capital expenditures were gradually increased over the 3-year period and the deferred expenditures were spread over the following 7 years. Thus, the total

expenditures for the 10-year period were equivalent. An additional 1% rate increase was required to fund Scenario 1, on top of inflationary increases, for 3 years from 2020-2022. Water and wastewater rates could then resume to inflationary increases.

Similarly, Scenario 2 had the same gradual increase but over 10-years and the deferred expenditures were spread over the following 10 years. The 30-year average annual expenditures were the same for both scenarios. The increase required to fund Scenario 2 was an additional 0.5% increase to rates, on top of inflationary increases, for 6 years from 2020-2025. Water and wastewater rates could then resume to inflationary increases.

It is prudent to consider the faster rate increase to close the annual funding gap to sustain the current LOS provided by the systems in a shorter time. Therefore, Scenario 1 is recommended to minimize the risk of deferred capital expenditures.

Over time, the Town can continue to refine their planning process and establish LOS that balance affordability with service delivery expectations.

Recommendations

Throughout the development of this AMP, a number of opportunities for improving AM at Fort Erie and supporting the development of subsequent AMP were identified. These recommendations are summarized within the AMP, and include the following:

1. Development of a formalized data management plan outlining the processes for data collection, verification, and management.
2. Completion of data management and business process improvement projects to support development of an asset centric, evidence-based asset management environment at the Town.
3. Software recommendations.
4. Collection of data to operationalize the LOS framework.
5. Fulfilment of required staff roles to ensure the Town has the resources to maintain and amalgamate the required data and perform the required analyses on an ongoing basis.

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ASSET MANAGEMENT POLICY

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ASSET MANAGEMENT STRATEGY

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ASSET MANAGEMENT PLAN

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1. DEFINITIONS AND GLOSSARY

Table 1: Glossary

Term	Definition
Asset	A resource with economic value that a municipality controls with the expectation that it will provide a benefit. An asset is specifically defined as property, equipment, vehicles, tools or other resources with a purchase value at or above the Capital Asset Threshold. Specifically, an Infrastructure Asset means the physical structures and associated facilities that form the foundation of development, and by or through which a public service is provided.
Asset Management (AM)	The coordinated activity of an organization to realize value from assets.
Asset Management (AM) Lead	A role within the Town responsible for directing asset management processes in the organization. The Asset Management Lead is responsible for ensuring the Asset Management Policy and Plan is relevant, suitable, adequate, reviewed and updated as required. The Asset Management Lead also has the authority to make or override asset management decisions made by Managers within Infrastructure Services, in adherence with this policy.
Asset Management Plan (AMP)	A plan developed for the management of infrastructure assets, in compliance with the Strategic Asset Management Plan from O. Reg. 588/17, that combines multi-disciplinary management techniques (including technical and financial) over the life cycle of the asset in the most cost-effective manner to provide a specific level of service. This typically includes plans to invest, design, construct, acquire, operate, maintain, renew, replace and decommission assets.
Asset Management Policy	A high-level statement of an organization's principles and approach to asset management (IIMM, 2015).

Term	Definition
Asset Management Strategy	Documented information that specifies how organizational objectives are to be converted into Asset Management objectives, the approach for developing AMPs and the role of the Asset Management System in supporting achievement of the Asset Management objectives (ISO 55000, 2014).
Asset Risk	The product of the likelihood/probability and the consequences that would be incurred if an asset was to fail.
Bridges and Structures	An asset category included within the AMP which includes bridges, culverts and retaining walls.
Capital Asset Threshold	The threshold at or above which a resource is considered an asset, the value of a municipal infrastructure asset at or above which a municipality will capitalize the value of it and below which it will expense the value of it. For the Town of Fort Erie, the capital asset threshold is defined in the Capital Asset Policy. However, items below the defined threshold may be included in the Asset Management Plan, based on risk or criticality, under the authority of the Director of Infrastructure Services or Director of Corporate Services.
Consequence of Failure (COF)	COF represents the socio-economic and environmental impacts of an asset's failure and is used to determine asset risk.
Core Municipal Infrastructure Asset	Any municipal infrastructure asset that is a - water asset that relates to the distribution of drinking water, - wastewater asset that relates to the collection of sanitary wastewater, - storm water management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of storm water, - road, including all assets in the right-of-way, or

Term	Definition
	- bridge or culvert.
Estimated Service Life (ESL) / Useful Life	An estimate of the duration of time that an asset is forecasted to be in service.
Facilities	An asset category included within the AMP which includes buildings maintained by the Town including Town Hall, libraries, fire stations, arenas, community centers and museums.
Infrastructure	Infrastructure means the physical structures and associated facilities that form the foundation of development, and by or through which a public service is provided to Ontarians, such as highways, bridges, bicycle paths, drinking water systems, as well as any other thing by or through which a public service is provided to Ontarians (Infrastructure for Jobs and Prosperity Act, 2015, S.O. 2015, c. 15).
Level of Service (LOS)	Level of Service is a qualitative or quantitative description of a service that is being provided. Two types of Levels of Service generally exist: Customer (or Community) Levels of Service which focus on statements of customer expectations for service delivery, in easy to understand language; and, Technical Levels of Service which focus on quantitative measures applied against assets and overall systems that define the performance requirements to support CLOS. In addition, the current LOS being provided by the Town (Current LOS) can be compared against the LOS the Town proposes to provide over the next ten years based on a lifecycle management and financial strategy (Proposed LOS).
Likelihood of Failure (LOF)	LOF represents the probability of an asset failing, which will increase over time as assets age but can also be impacted by the type of asset and the conditions the asset is subjected to.

Term	Definition
LOS Framework	A set of tables which outlines the Levels of Service developed for each service category.
O. Reg. 588/17	Ontario Regulation 588/17 under the Infrastructure for Jobs and Prosperity Act 2015, as amended. Principles are set out in this regulation by the provincial government to regulate asset management planning for municipalities.
Performance Measure	Parameters / metrics that can be measured and monitored to assess the delivery of a service that is being provided.
Public	Residents and businesses in the Town of Fort Erie and other interested parties.
Reserves	A reserve is an allocation of accumulated net revenue. The Town's current strategy is to contribute fixed amounts to capital reserves which supports capital spending together with grants, DCs, debt, etc.
Roads and Right of Ways	An asset category included within the AMP which includes the road base, asphalt, curbs, sidewalks and streetlights.
Stormwater Management	An asset category included within the AMP which includes storm sewers, ditches, stormwater management ponds and manholes.
Wastewater Collection	An asset category included within the AMP which includes wastewater sewers, manholes.
Water Distribution	An asset category included within the AMP which includes mains, valves, service laterals, curb stops, hydrants and hydrant leads.

1 INTRODUCTION

1.1 Objectives and Purpose

The Town of Fort Erie continues to make planned investments in existing infrastructure, staying aware of legislative changes, future growth and changing climate. The implementation of an Asset Management Policy, Strategy and Plan is necessary to adapt to infrastructure challenges as the Town continues to evolve.

The objective of this effort is to maximize benefits, manage risk, and provide satisfactory levels of service to the public in a sustainable manner. Asset management requires a thorough understanding of the characteristics and condition of infrastructure assets, as well as the service levels expected from these assets. It also involves setting strategic priorities to optimize decision making about when and how to proceed with investments. Finally, it requires the development of a financial plan which is the most critical step in putting the plan into action. The AMP embeds these asset management elements into ongoing capital, operations, and maintenance activities.

The overall purpose of the Town's AMP is to provide a comprehensive document that will guide corporate decision making related to the construction, operation, maintenance, replacement, expansion, and disposal of infrastructure assets, while minimizing risk and cost to the Town and its taxpayers and maximizing service delivery.

The AMP allows the Town to:

- Establish long-term infrastructure master plans and the annual budget;
- Develop sustainable financial plans;
- Maintain customer and technical levels of service;
- Consistently consider options related to assets, based on the AMP and levels of services;
- Support funding applications to the federal and provincial levels of government; and
- Meet legislative requirements.

1.2 Scope

This AMP applies to all core municipal infrastructure assets owned by the Town and has been expanded beyond mandated scope requirements to also include Facilities assets. The asset categories included in the scope are the following:

- Water Distribution (e.g. mains, valves)
- Wastewater Collection (e.g. sewers, manholes)

- Stormwater Management (e.g. sewers, manholes)
- Roads and Right of Ways (e.g. roads, sidewalks, streetlights)
- Bridges and Structures (e.g. bridges, culverts, retaining walls)
- Facilities (e.g. Town Hall, Fire Stations, Libraries)

The Town maintains other assets, including Parks, Cemeteries, Fleet, IT, etc., however, these are not considered core assets and have not been included in the current AMP.

While this report covers a forecast period of 10 to 50 years, the full lifecycle of the Town's assets included in this plan was considered in the calculations. It is suggested that more focus and attention be put on the first 10 years of the asset management plan to ensure accurate capital planning in the short term.

1.3 Methodology and Framework

The framework of this AMP is established fundamentally on the Corporate Strategic Plan, where Council set out priorities, goals, and initiatives for the Town of Fort Erie. In addition, the AM Policy also sets out the framework for this AM Plan.

This AMP structure and content aligns with the Province's "Building Together Guide for Municipal Asset Management Plans" and on "Ontario Regulation 588/17 – Asset Management Planning for Municipal Infrastructure" to ensure asset management at the Town of Fort Erie is most functional and effective.

Of most importance in the AMP are the following key sections:

The **Asset Management Policy** affirms the Town's approach to infrastructure asset management through defined commitments and principles for decision-making (prescribed by legislation) and aligns asset management into strategic planning processes. This policy was approved by the Town's Council on May 21, 2019.

The **Asset Management Strategy** sets out the main policies, practices, and actions that are taken to minimize the lifecycle cost of the assets. This includes operational activity and capital expenditures. Workshops were held with key staff to document the current policies and practices, and to identify opportunities for improvement to further reduce lifecycle costs while meeting desired LOS. This strategy was approved by the Town's Council on May 21, 2019.

The **Defined Levels of Service Section** contains both currently reported performance measures and a preliminary assessment of proposed LOS, or 'targets', including new legislated performance measures. Workshops were held with the key Town staff to obtain a common understanding of the nature and purpose of customer and technical LOS and to define a preliminary set of measures. Further work is required to fully develop, measure, and verify several current and proposed LOS including several

legislated performance measures. Technical Memorandum 5 (provided in Appendix E) further supports the information in this section.

The **State of Local Infrastructure Section** includes details about the current condition and value of the asset classes covered by the AMP. This approach provides a common reporting protocol that can be used for all assets across the Town. Technical Memorandum 4 (provided in Appendix D) further supports the information in this section.

The **Implementation Plan Section** contains the results of the scenario analysis completed to compare strategies to address infrastructure needs while balancing LOS, risk, and affordability. This analysis was used to identify funding gaps to meet proposed LOS. Technical Memorandum 6/7 (provided in Appendix F) further supports the information in this section.

The **Financing Strategy Section** includes both historical and future budgeted capital and operating expenditure and identifies the major funding sources. This strategy represents the estimated amount of capital the Town requires to reinvest in its existing asset inventories on an annual basis to sustain the current level of service. The future budgeted expenditure has been compared to investment needs arising from the Asset Management Strategy to identify potential future funding shortfalls. Technical Memorandum 8 (provided in Appendix G) further supports the information in this section.

1.4 Linking to Corporate Planning Documents

The AMP is dynamic and must continually align with other corporate planning documents that involve needs or commitments related to municipal infrastructure assets. At the Senior Management and Council level, corporate plans are established in full consultation with infrastructure services and asset management authorities to ensure this alignment continues and the AMP remains current and relevant. It is the same staff that formulate these long term, strategic documents with financial commitments that are consulted throughout the AMP development process.

These corporate planning documents may include:

-
- Official Plan
 - Corporate Strategic Plan
 - Budget Book
 - Wastewater Master Plan (2019)
 - Water Master Plan (2017)
 - Storm Sewer Master Plan
 - Roads Master Plan (2017)
 - Bridge and Culvert Assessments (2017)
 - Accessibility Plan (2013-2017)
 - Facilities Needs Study (2006)
 - Roads Needs Database (2017)
 - Fort Erie Waterfront Strategy (2017)
 - Development Charge By-Law (2019)

1.5 Growth Considerations

Census data indicates that the Town's population was 30,700 in 2016. Population projections to the year 2041 were established by Niagara Region through Niagara 2041 and the Municipal Comprehensive Review. These projections estimated a total population of 43,940 by the year 2041. This number represents approximately 40% population growth over the 25-year period between 2016 and 2041. During that period, the rate of population growth was also projected to increase by approximately 10% over the ten (10) year period between 2016 and 2026. An increase in population growth will result in greater demands on the Town's infrastructure and will provide the Town with an increase in revenue that can be put towards asset renewal.

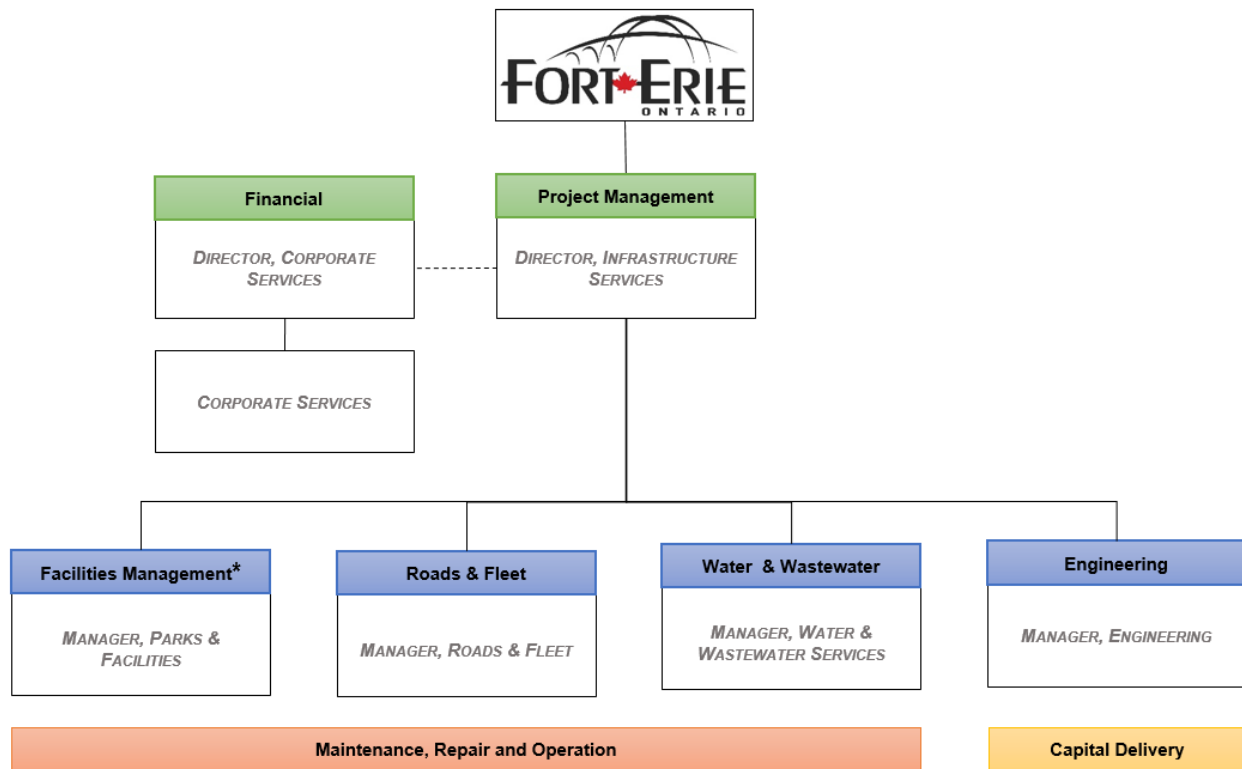
Along with population growth, infrastructure expenditures will also increase. The Niagara Region 2016 Water and Wastewater Master Servicing Plan Update indicates Capital Program expenditures of \$306,649,000 for Water Services and \$500,318,000 for Wastewater Services. Other infrastructure expenditures will follow suit.

Although the AMP's financial strategy does factor in population growth, the AMP is largely focused on expenditures to address the state of good repair of existing infrastructure. Corporate strategic documents, such as the Water and Wastewater Master Servicing Plans, address infrastructure needs to support growth. As new or upgraded infrastructure comes online from these capital programs, these assets will be incorporated into the AMP.

1.6 Roles & Responsibilities

The AM Policy defines the overall governance structure for Asset Management at the Town of Fort Erie, including key roles, responsibilities, and authorities.

To support this, further details on project staff hierarchy and roles are outlined with Figure 1 below.



* Facilities Management provides capital delivery for facilities.

Figure 1: AMP Staffing Hierarchy

The Director of Infrastructure Services is responsible for overseeing AMP progress, monitoring quality, and providing direction and support as required.

The department leads represent their respective asset category and act as the group's representative. The leads are responsible for providing the necessary input in terms of workshop discussion, technical review, coordinating the provision of data, and acquiring a summary of feedback from additional subject matter experts within the department. As outlined in the above organization chart, the Facilities Management, Roads & Fleet, and Water & Wastewater divisions are responsible for the ongoing maintenance, repair, and operation of their respective assets. Engineering is responsible for maintaining their own data for capital delivery for these groups, except Facilities Management provides the capital delivery for facility assets.

Corporate Services is responsible for working with Infrastructure Services to ensure the financial budgets and long term financial plan is aligned with the asset forecasts and Levels of Service. Corporate Services is also responsible for financial reporting on assets and maintaining the financing and revenue strategy in alignment with the Asset Management Plan, Budget, and Reserve Policies.

2 DEFINED LEVELS OF SERVICE

A comprehensive LOS Framework has been developed for all AMP asset categories and further details are available in Technical Memorandum 5, provided in Appendix E. The LOS Framework tables are provided in Appendix A.

2.1 Background

Asset Levels of Service are a foundational part of the Town's Corporate Asset Management Strategy. The development of performance measures that align with community values and corporate priorities to technical indicators/metrics is a critical component on a functional Asset Management System. Levels of Service (LOS) are also at the core of O. Reg. 588/17 which will require municipalities to understand the cost to achieve higher or lower levels of service. The Level of Service metrics presented in this report have been established through best practices and Town processes.

As noted above, further work is required to fully develop, measure, and verify several current and proposed LOS, including several legislated performance measures.

The legislated LOS deadlines are:

- current LOS assessment for core assets is July 1, 2021;
- current LOS assessment for all assets by July 1, 2023; and
- proposed LOS assessment for all assets, linking to a funding strategy, by July 1, 2024.

2.2 Framework

The structure of the LOS Framework tables was developed using international best practices. The LOS tables are comprised of the following components:

- Service Statement (overall objective of asset service to the public);
- Key Service Attribute (specific objective of asset service to the public);
- LOS Statement (description of objective in a statement form);
- Performance Measures (customer and technical parameters to measure and monitor as a means to assess delivery of LOS Statement);
- Current Performance (current level of service, as clearly defined or indexed where possible);
- Data Source (source of the information used to define the current performance);
- Proposed Performance (proposed level of service, where known); and

- Forecast (symbol indicating if proposed level of service is expected to trend up, down, or remain at current level).

Each performance measure is categorized as one of the following:

- Foundational Measures (shaded blue): These measures have available data to track current performance levels and have been tied into the financial strategy to develop proposed LOS.
- Advanced Measures (shaded green): These measures either do not have data to track current performance at this time or are currently not tied into the financial strategy.
- O. Reg. 588/17 Measures (shaded peach): These measures are legislated under O. Reg. 588/17 and must have current performance defined by 2021 and proposed performance defined by 2024.

The Town will continue to collect additional data and complete various projects/activities to populate remaining current performance metrics over the life of this plan.

2.3 Growth Trends

Population growth and increasing expenditures will affect the Levels of Service established by the Town during this project. Several of the established Customer and Technical performance measures – in particular, current performances and targets – will likely increase along with population and expenditures.

An analysis of the performance measures established within this AMP has been completed to understand how the performance and targets are forecasted to change, either increasing or remaining the same. Typically, metrics that are estimated to remain the same are those that measure performance as an average or percentage of the system of assets in question. These results are included in the LOS Tables (Appendix A), for both Customer and Technical performance measures.

3 STATE OF LOCAL INFRASTRUCTURE

3.1 Asset Inventory & Valuation

3.1.1 Asset inventory

Asset information is stored in multiple locations, including Accpac, with GIS being the main source for inventory data. This data was combined into an asset inventory containing approximately 8,944 asset records with a total replacement value of approximately \$1 billion, given the following caveats:

- Valuations shown are predicated upon average local values for replacement of infrastructure in the absence of invoice costs or average values provided from Town Staff.
- Values shown do not reflect economies of scale with respect to the coordinated replacement of infrastructure.
- Replacement values assume replacement with modern equivalent infrastructure.
- Increase to the accuracy of these valuations and the financial plan presented will require the improvement of the Town's core infrastructure data in several key areas.

An overview of the asset inventory is provided in Table 2.

Table 2: Asset Inventory

Regulatory Category	Service Category	Asset	Data Source	Inventory
Core Assets	Roads & Right of Ways (ROW)	Roads	GIS Inventory	423 km
		Streetlights	GIS Inventory	3,342 assets
		Sidewalks	Inspections	144 km
	Water	Mains	GIS Inventory	265 km
		Hydrants	GIS Inventory	1,531 assets
		Valves	GIS Inventory	1,836 assets
	Wastewater	Sewers	GIS Inventory	194 km
		Manholes	GIS Inventory	2,477 assets
	Stormwater	Sewers	GIS Inventory	123 km
		Manholes	GIS Inventory	2,093 assets
	Bridges & Structures	All	Database, Inspections	179 assets
Non-Core Assets	Facilities Management	All	Inspections	16 Facilities, 974 Assets

It should be noted that for the AMP analysis, the linear infrastructure was only broken down into mains or sewers, as hydrants, valves, and manholes are typically replaced with the main/sewer. In addition, roads include all the assets that fall within the ROW.

The asset inventory was structured in a hierarchy with four levels to support subsequent AM analysis. The purpose of an asset hierarchy is to ensure that asset inventories are broken down into logical cohorts to support decisions that are made by subject matter experts pertaining to how, when, and why to spend money on assets. The hierarchy of each asset category should be considered as flexible to ensure that it can evolve as the practical management of the Town's assets changes over time.

Asset Level 1 is consistent across all assets, representing the 6 asset categories of the data provided by the Town. Asset Levels 2, 3, and 4 are then used to further break down assets based on the practical need to assign different levels of service or lifecycle management strategies to an asset. The asset hierarchies used in the AM analysis are provided in Table 3.

Table 3: Asset Hierarchy

Level 1	Level 2	Level 3	Level 4
Roads & ROW	Sidewalks	-	-
	Streetlights	-	-
	Roads	Collector	Hot Mix Asphalt Surface Treated
		Local	Earth
			Gravel
			Hot Mix Asphalt Surface Treated
			Hot Mix Asphalt Surface Treated
		Minor Arterial	Hot Mix Asphalt Surface Treated
		Gravel & Clay	Gravel & Clay
Bridges and Structures	Bridge	-	-
	Culvert	-	-
	Retaining Wall	-	-
Sanitary	Sewers	-	-
Stormwater	Sewers	-	-
Water	Mains	-	-
Facilities*	Facility Name (e.g. Centennial Library)	Uniformat II (e.g. C3020-Floor Finishes)	Asset Type (e.g. Carpet)

*Due to the size of the Facilities hierarchy, not all types have been shown.

3.1.2 Data Sources and Gaps

A detailed review of the Town's data was completed to identify the maturity (completeness) of the data and the confidence (accuracy/consistency) in the data. In addition, all critical data gaps that prevented further analysis and/or limited reporting capabilities (e.g., performance could not be calculated from lack of condition or age information) were also outlined in Technical Memorandum 1, provided in Appendix B. A summary of gaps and assumptions are provided in Table 4, using the following guide:

- ✓ Data was available and no, or limited, adjustments were made.
- ✓ No or partial data was available, but full data was derived using standards and assumptions.
- ✗ No data was available (data gap) or there is low confidence in the available data.

Table 4: Data Gaps and Assumptions

Asset Data	Replacement Costs	Estimated Service Life	Age/Install Date	Performance/ Condition
Roads	✓	✓	✗	✓
Streetlights	✓	✓	✓	✓
Sidewalks	✓	✓	✗	✓
Wastewater Sewers	✓	✓	✓	✓
Storm Sewers	✓	✓	✓	✓
Water Mains	✓	✓	✓	✓
Bridges & Structures	✓	✓	✓	✓
Facilities Management	✓	✓	✓	✓

3.1.3 Valuations

Traditionally, there have been two types of valuations; financial accounting valuations use historical costs and depreciation assumptions while replacement cost valuation is forward-looking and accounts for expected inflation, changes in technology, and other factors. For the AMP, replacement costs valuations were used, while financial accounting valuations are available through the Town's financial reporting, in accordance with Public Sector Accounting Board (PSAB) requirements.

The Town had previously established per-asset costs for Bridges and Structures and most Facility assets. Through the development of this AMP, a combination of Town-provided replacement unit costs and industry standard best practice replacement unit costs were used to determine the appropriate per-asset replacement values for the remaining asset categories. It should be noted that these replacement values do not address economies of scale as they represent the value to replace each asset

individually. The unit replacement cost estimates for core asset categories and Facilities are available in Technical Memorandum 4 Table 2 and 3, provided in Appendix D.

The Roads asset category was the only one to use rehabilitation treatment types in this iteration of the analysis even though the Town performs rehabilitation treatments on other asset categories (such as Wastewater, Stormwater, etc.). There was a lack of data on the impact of these forms of rehabilitation on an asset's performance for these other asset categories, and so they were left for future refinement of the Town's analysis. As a result, all asset categories aside from Roads used replacement-only treatment types in their lifecycle strategies in the predictive scenarios. The unit rehabilitation costs used in the AM analysis are available in Technical Memorandum 4 Table 4, provided in Appendix D.

An overview of the total replacement value for the assets within each service category are provided in Table 5 below.

Table 5: Asset Valuations

Service Category	Asset	Current Replacement Value
Roads & ROW	Roads	\$386,403,656
	Streetlights	\$2,406,240
	Sidewalks	\$23,326,386
Water	Mains	\$171,796,084
	Hydrants	Built into Main Costs
	Valves	Built into Main Costs
Wastewater	Sewers	\$136,003,666
	Manholes	Built into Sewer Costs
Stormwater	Sewers	\$156,184,476
	Manholes	Built into Sewer Costs
Bridges & Structures	All	\$37,350,500
Facilities Management	All	\$98,423,527
Total:		\$1,003,807,668

The replacement value breakdown for each asset category are provided in Figure 1 to 7.

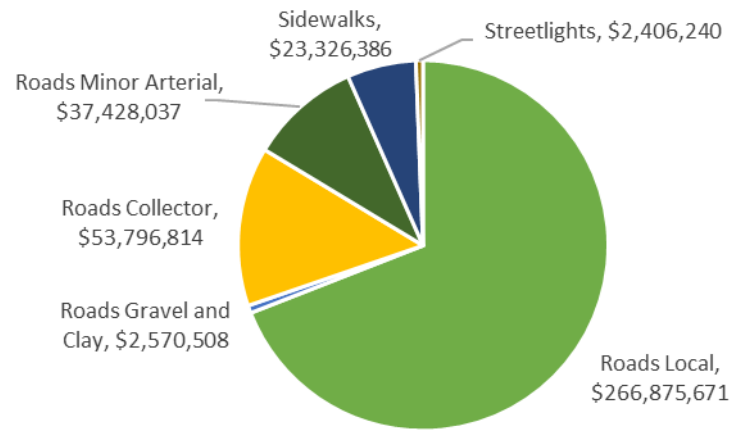


Figure 2: Road Replacement Value Breakdown by Road Class

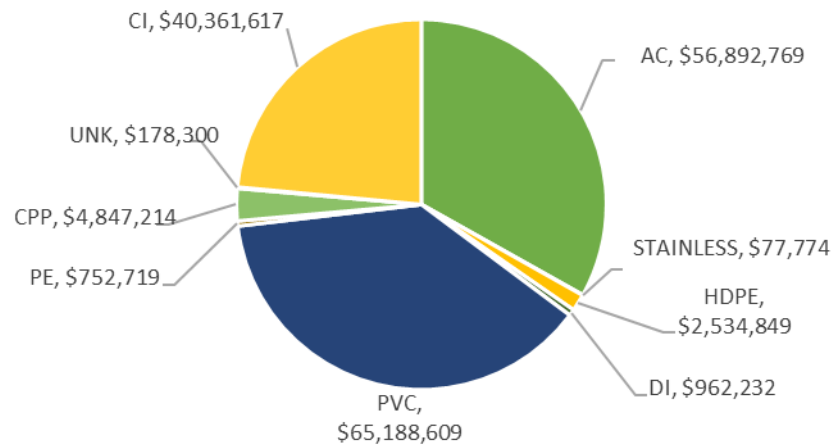


Figure 3: Watermain Replacement Value Breakdown by Material

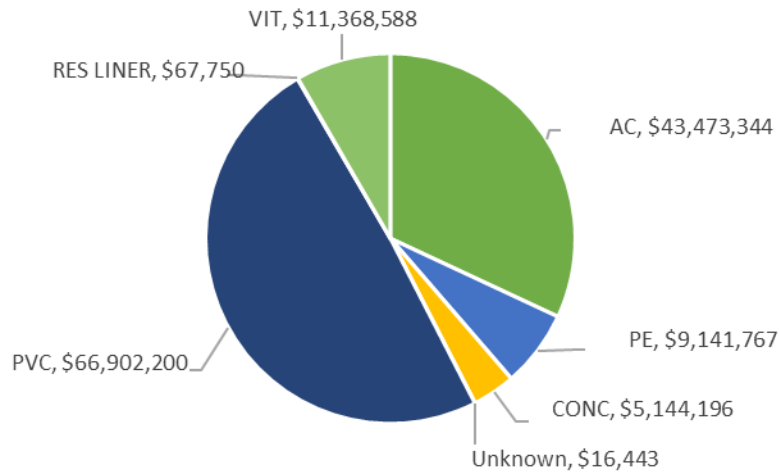


Figure 4: Wastewater Sewer Replacement Value Breakdown by Material

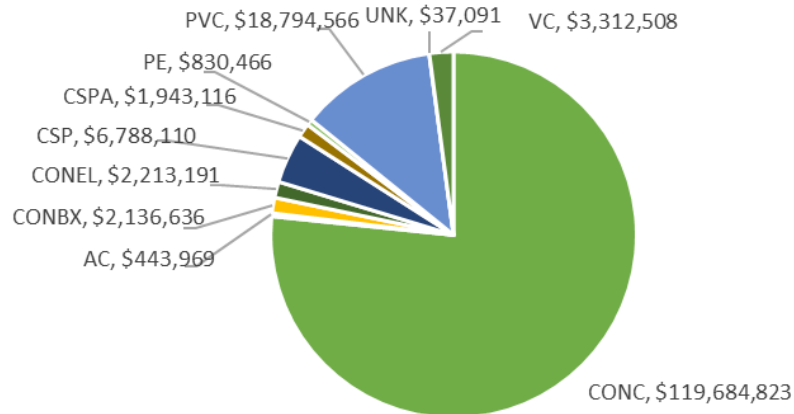


Figure 5: Storm Sewer Replacement Value Breakdown by Material

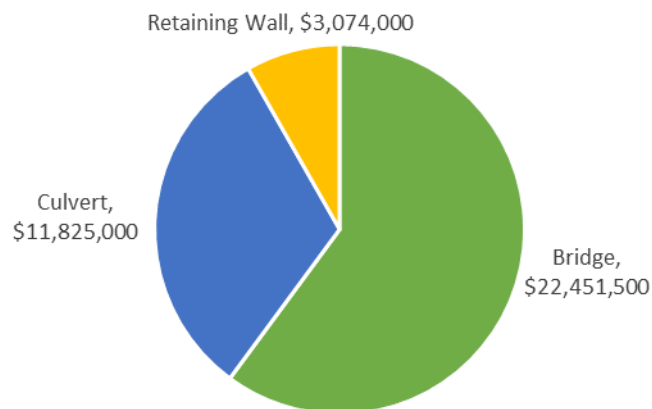


Figure 6: Bridges & Structure Replacement Value Breakdown by Asset Type

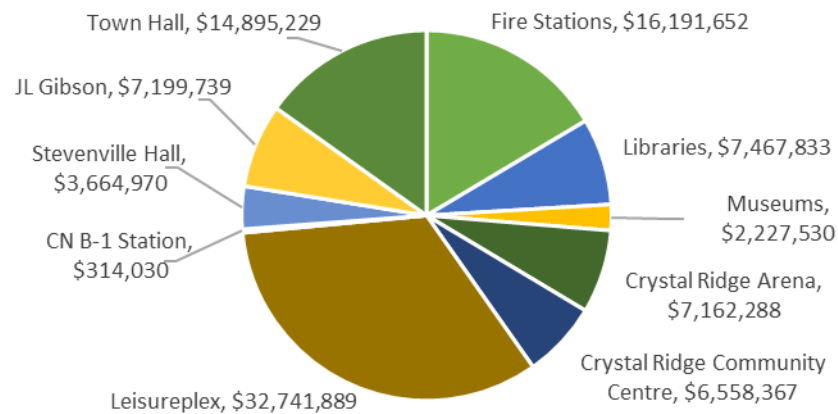


Figure 7: Facilities Management Replacement Value Breakdown by Facility Type

3.1.4 Age Distribution and Service Life

The average age of each asset category is provided in Table 6.

Table 6: Asset Age

Service Category	Asset	Average Age (Years)
Roads & ROW	Roads	62
	Streetlights	2
	Sidewalks	Insufficient Data
Water	Mains	38
	Hydrants	Same as Mains
	Valves	Same as Mains
Wastewater	Sewers	35
	Manholes	Same as Sewers
Stormwater	Sewers	33
	Manholes	Same as Sewers
Bridges & Structures	All	44
Facilities Management	All	18

The asset age distribution and the asset age as a proportion of ESL for all assets are provided in Figure 8 and 9.

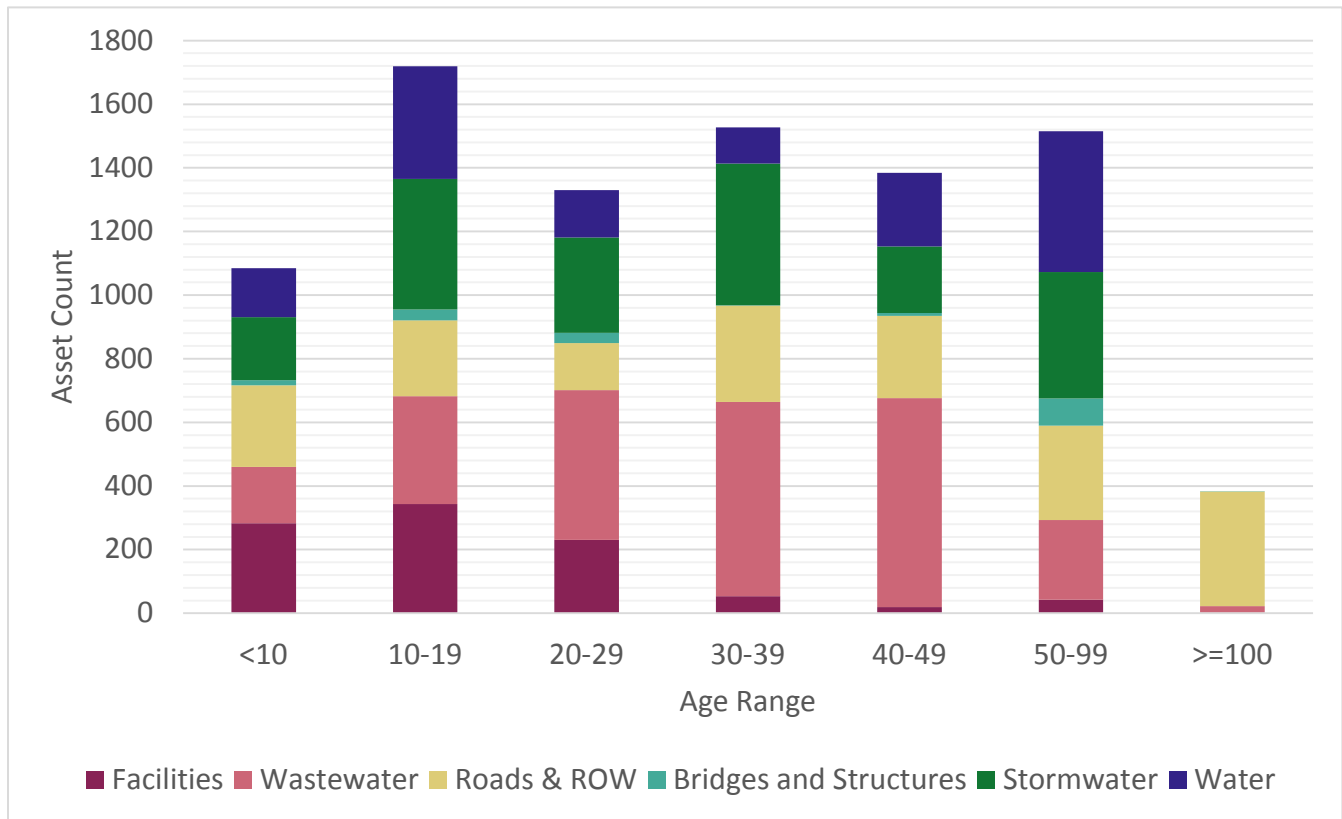


Figure 8: Age Distribution of All Assets

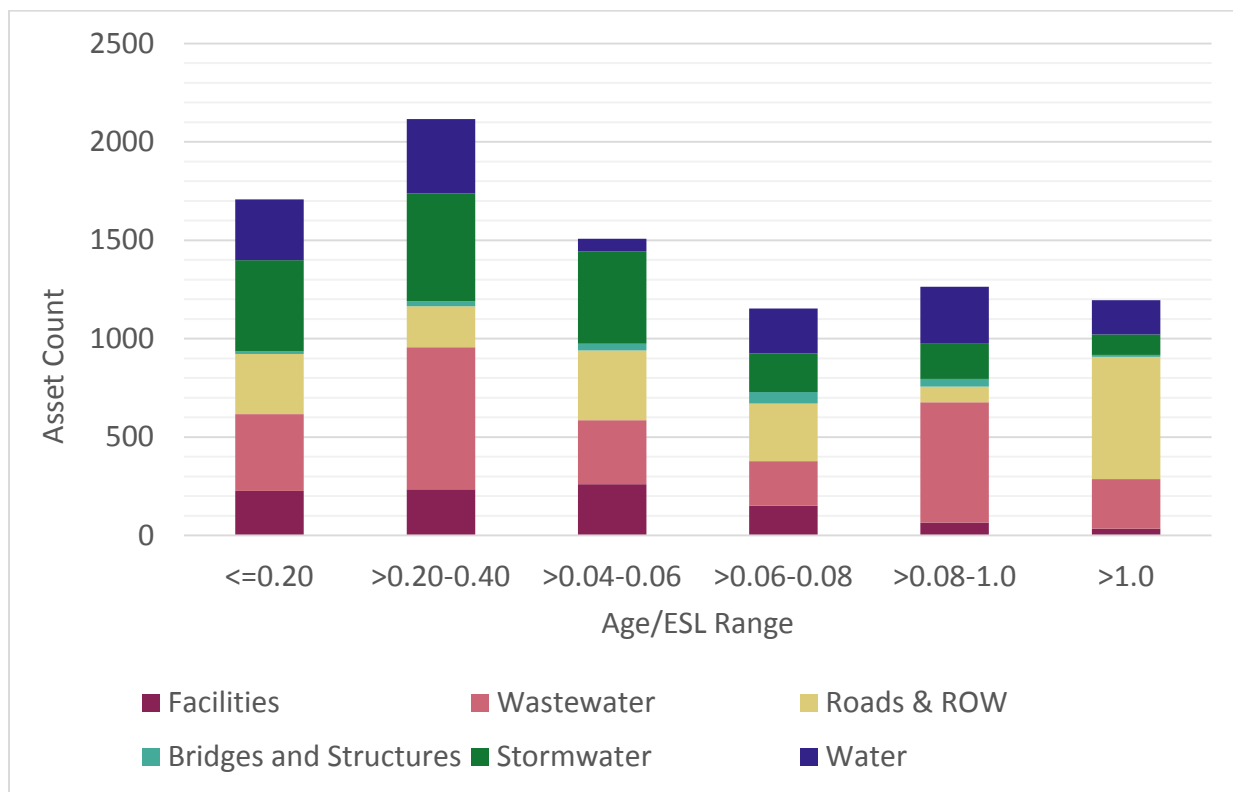


Figure 9: Age Distribution as a proportion of ESL for All Assets

3.2 Asset Condition

Performance categories were assigned based on a performance score which was calculated for each asset based on the best available data. Condition data was used where available, otherwise the age and ESL of an asset were used to estimate performance. Where condition and age/ESL data were limited or unavailable, no performance score was assigned.

For ease of comparison, this performance score was made consistent across all asset groups, except water assets. For water assets, it was found that the age of the assets misrepresented the performance of the system and therefore the number of breaks was used to assign a performance category but could not be easily converted to the same performance scoring system. The performance categories used for all asset groups is shown in Table 7.

Table 7: Performance Categories

Performance Category	Description
Very Poor	Unfit for sustained Service - These assets are below standard condition with widespread signs of deterioration
Poor	At Risk - These assets are mostly below standards and many elements are approaching the end of their service life
Fair	Requires Attention - some assets show general signs of deterioration and some deficiencies are starting to show
Good	Adequate for Now - Most assets are functioning with a few elements showing signs of deterioration
Excellent	Fit for the Future - Overall condition of assets and their associated elements is good or newly replaced/rehabilitated

The complete methodology for how the performance was assigned within the system is available in Technical memorandum #12: Database Analysis and Logic, provided in Appendix I.

The average condition of all assets weighted by replacement value was determined to be in Good condition, as outlined in Table 8 and illustrated in Figure 10.

Table 8: Average Condition for Each Service Category

Service Category	Asset	Data Used for Performance	Average Performance Weighted by Value
Roads & ROW	Roads	Condition	Good
	Sidewalks	Condition	Good
Water	Mains	Number of Breaks	Good
Wastewater	Sewers	Age/ESL	Fair
Stormwater	Sewers	Age/ESL	Fair
Bridges & Structures	All	Condition	Good
Facilities Management	All	Condition	Good
Overall Average:			Good

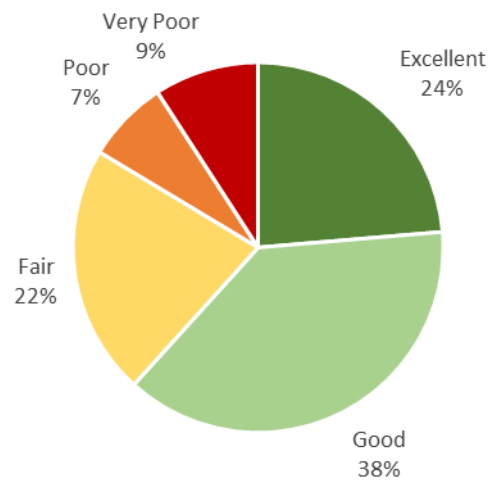


Figure 10: Performance Breakdown for All Assets (with performance data)

The condition breakdown for each asset category are provided in Figure 11 to 17.

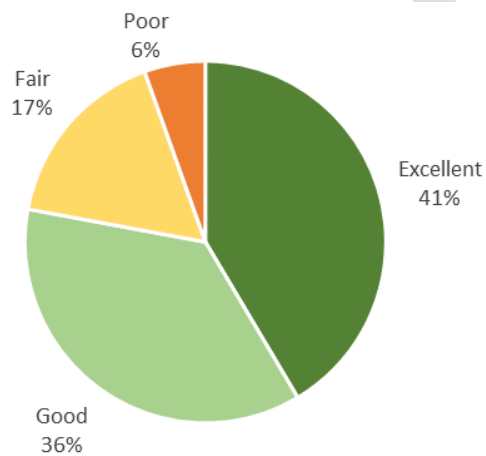


Figure 11: Road Performance Breakdown

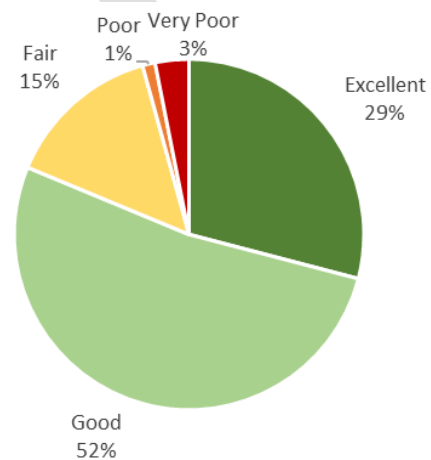


Figure 12: Sidewalk Performance Breakdown

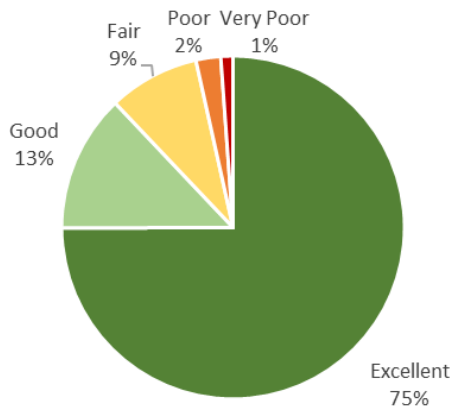


Figure 13: Watermain Performance Breakdown

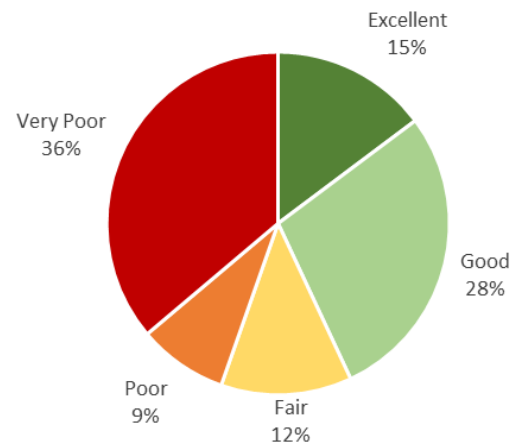


Figure 14: Wastewater Sewer Performance Breakdown

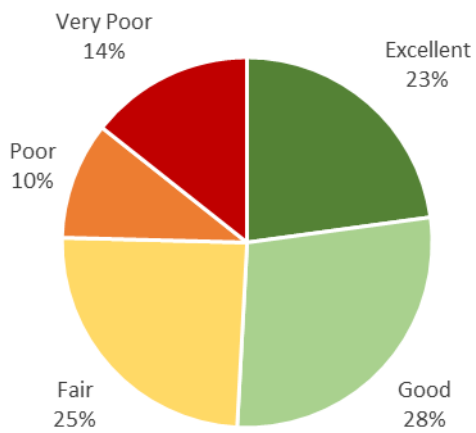


Figure 15: Stormwater Sewer Performance Breakdown

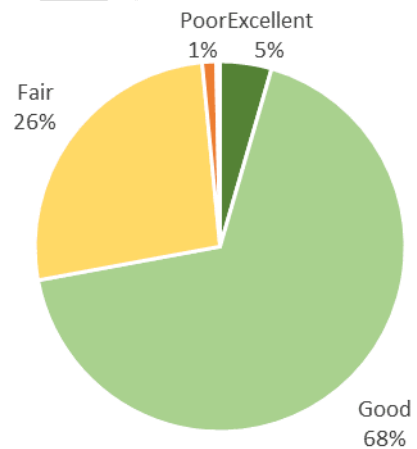


Figure 16: Bridge & Structures Performance Breakdown

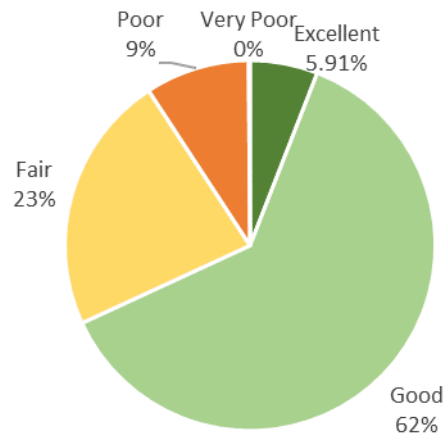


Figure 17: Facilities Management Performance Breakdown

3.3 Data Verification Process and Condition Assessment Process

Each department within Infrastructure Services schedules condition assessments for the assets they are responsible for, as required and in alignment with budget needs. Information related to tracking AMP progress (e.g. condition, age, value, etc.) will be updated within the register at least once per year to track current LOS and AMP progress. In addition, every 5 years the Town will update the AMP which will involve completing an updated analysis with the most recently available asset information.

Currently, the Town has basic processes to review and verify data, however, to support the development of subsequent AMPs it is recommended that the Town develop a formalized data management plan outlining the processes for data collection, verification, and management. The requirements and steps necessary to complete the data management plan are outlined in Section 8.1.

4 IMPLEMENTATION PLAN

4.1 Scenario Analysis

An analysis of several scenarios was completed to forecast the Town's infrastructure needs and determine the required expenditures to address these needs. The main analysis focused on two different scenarios, which were performed to understand the difference between performance projections using a fixed budget based on the Town's current forecasted spending and an unlimited spending scenario which replaces assets once they reach the end of their service life.

Alternatives to these scenarios were also analyzed to determine a better balance between risk, service levels, and affordability. The full details of the analyzed scenarios are available in Technical Memorandum 6/7, provided in Appendix F.

Asset risk was incorporated into some scenarios by establishing performance triggers for replacement based on the COF for different asset types. For example, assets with a high COF would have a higher performance target that would trigger an intervention earlier in its lifecycle than an asset with a low consequence of failure. The COF scores and associated performance triggers are outlined for each asset category in Technical Memorandum 6/7, provided in Appendix F. Table 9 below provides a high-level overview of the condition targets for each service category.

Table 9: Asset COF Score Assignment

Service Category	Criticality Based On	Condition Target
Bridge and Structures	Area (m ²)	Replace larger assets earlier in their lifecycle. The most critical assets are replaced before they reach very poor condition.
Facilities	Facility	Replace assets in the most critical facilities before they reach poor condition. Assets in less critical facilities are allowed to degrade to very poor condition (i.e. at the end of their ESL). While not included in this iteration of the DSS, most Facility assets have some sort of rehabilitation performed on them before they reach their target replacement condition.
Roads & ROW	Ontario MMS Highway Classification	Replace all roadways and assets that fall within the ROW before the roadway reaches poor condition. More critical

Service Category	Criticality Based On	Condition Target
		roadways (Minor Arterial and Collector) are maintained in Excellent condition, while less critical roadways (Local) are prevented from falling below good condition. The overall network target is Excellent condition.
Wastewater	Diameter (mm)	Replace larger diameter sewers earlier in their lifecycle. The most critical assets are replaced once they reach poor condition (maintained at fair or better).
Stormwater	Diameter (mm)	Replace larger diameter sewers earlier in their lifecycle. The most critical assets are replaced once they reach poor condition (maintained at fair or better).
Water	Diameter (mm)	Replace larger diameter sewers earlier in their lifecycle. The most critical assets are replaced once they reach poor condition (maintained at fair or better).

4.2 Findings

4.2.1 Roads

The results of the scenario analysis demonstrated that the Town's current budget should meet road asset needs over the next ten years, particularly if priority is given to higher COF roads (e.g. higher traffic roadways). In addition, the results corroborated that the additional \$200,000 in spending (in addition to inflationary increases) recommended by the 2018 Road Needs Study Update report and included in the 2019 budget should bring the Town to their desired average performance of 80 PCI over the next ten years. Because the Town is currently using a system for determining future capital expenditures on Road assets, Decision Optimization Technology (DOT), it is recommended that the Town continue to follow the recommendations provided by this software and maintain the current budget.

4.2.2 Wastewater

Based on the results of this analysis, there appears to be a major gap between the Town's current spending and infrastructure needs. However, the performance for these models is based on the age of the sewers and their expected service life, rather than

real condition information. This is due to the inability to access historical CCTV inspection data, as the condition information is not available in a digital format.

Because of this, it is recommended that the Town focus their efforts over the next few years to collect CCTV data in a digital format from a representative sample of sewers. As the analysis indicates, the current budget should maintain the average performance of the system over the short term while this additional information is collected and used to reevaluate these results based on real condition information.

To address the need for additional CCTV collection, a 3% increase per year, which equates to approximately \$50,000 in 2020, is recommended to maintain assets at a similar performance level while increasing spending for the CCTV inspection work. With a 3% increase per year for 10 years, the Town should be able to inspect a representative sample over the next few years and completely CCTV their system over 7 years if all additional funding goes towards this program. However, based on available data it is expected that more than 7 years of increased funding will be required to maintain the LOS of the system, though the result data from the CCTV inspection will provide additional insight.

4.2.3 Storm

As this analysis demonstrates, the Town's currently planned spending results in a minor degradation of performance over the next 10 years. However, this data is based on the age of assets rather than the actual condition of assets. To address this, the Town has begun a storm sewer CCTV program with currently available funding which will provide actual condition information rather than relying on age-based estimates. As such, it is recommended that the Town continue with the current budget, which only results in minor degradation in this analysis, while CCTV data is collected. This will provide the Town with a more accurate view of the performance of this asset portfolio, which can then be used to provide more accurate predictions regarding funding requirements.

4.2.4 Bridges & Structures

The results of this analysis indicate that the Town is meeting the bridge and structure infrastructure needs, however, the average performance of this portfolio is projected to degrade over the next ten years regardless of the scenario. This is due to the analysis being restricted to replacement work which, due to the nature of the infrastructure having long life spans, would not be expected to reach the target condition for replacement over the next ten years. This suggests that performing ongoing maintenance and rehabilitation work over the next ten years will help to maintain the performance of the Town's Bridges and Structures. Since the Town has a current system for determining capital expenditures for these assets, it is recommended that the Town continue to follow the recommendations provided by this software.

4.2.5 Facilities

The results of this analysis indicate that the average performance of this portfolio is projected to degrade over the next ten years but is still meeting the projected infrastructure needs.

This lowering of the average performance for Facilities over time is likely due to the analysis being restricted to replacement work. The majority of the replacement value for facilities is in assets that are forecasted to be replaced in the long term, beyond the next ten years. This results in the assets showing a trend of performance degrading over the ten-year forecast without enough replacements taking place in that span to bring the performance trend upwards.

However, these scenarios don't account for the maintenance and rehabilitation work that is typically completed to maintain facilities. This type of work helps to maintain and improve the condition of assets, which improves the average performance of the asset category. Because of this, as long as typical maintenance and rehabilitation work are completed as needed, the Town should be able to maintain the current level of service provided by Facility assets with the existing budget.

4.2.6 Water

The results of the updated watermain break analysis corroborate the findings from the 2017 WMSP, which indicated that an increase of \$380,000/year in funding from 2015 levels will allow the Town to remain below the 50 breaks/year target threshold. As the Town's Council has since endorsed this additional funding strategy for 2018 to 2024, no further funding increases should be necessary.

4.2.7 Resulting Plan

As described in the previous section, only wastewater assets are recommended for additional spending to help maintain the state of good repair while completing a CCTV program. The spending projected within these analyses included a 3% increase per year over ten years for wastewater assets, which would result in an increased expenditure of \$2.7M over 10 years in addition to annual inflationary increases to contributions. However, the required expenditure may vary based on the size and scope of the program the Town is interested in completing.

For the remainder of the asset categories, the existing budget was found to be adequate to maintain LOS.

Based on these recommendations, Table 10 outlines the recommended target funding and the current deficit for each asset class.

Table 10: Annual Capital Expenditure Summary

Asset Category	2019 Avg. Annual 10-Year Contribution to Reserves (\$000)	Current Avg. Annual 10-Year Gas Tax and Other Grants (\$000)	Total Current Avg. Annual 10-Year Funding (\$000)	Avg. Annual Funding to Maintain Current LOS (\$000)	Avg. Annual Infrastructure Funding Gap (\$000)
Bridges & Structures	\$370	\$650	\$1,020	\$1,020	\$0
Facilities	\$830	\$0	\$830	\$830	\$0
Roads & ROWs	\$3,050	\$480	\$3,530	\$3,530	\$0
Sanitary	\$1,630	\$0	\$1,630	\$1,900	\$270
Stormwater	\$1,430	\$0	\$1,430	\$1,430	\$0
Water	\$1,720	\$0	\$1,720	\$1,870	\$150
Total	\$9,030	\$1,130	\$10,160	\$10,430	\$420

In addition, Figure 18 outlines the recommended 10-year capital plan to address the state of good repair of the assets and their resulting average weighted performance.

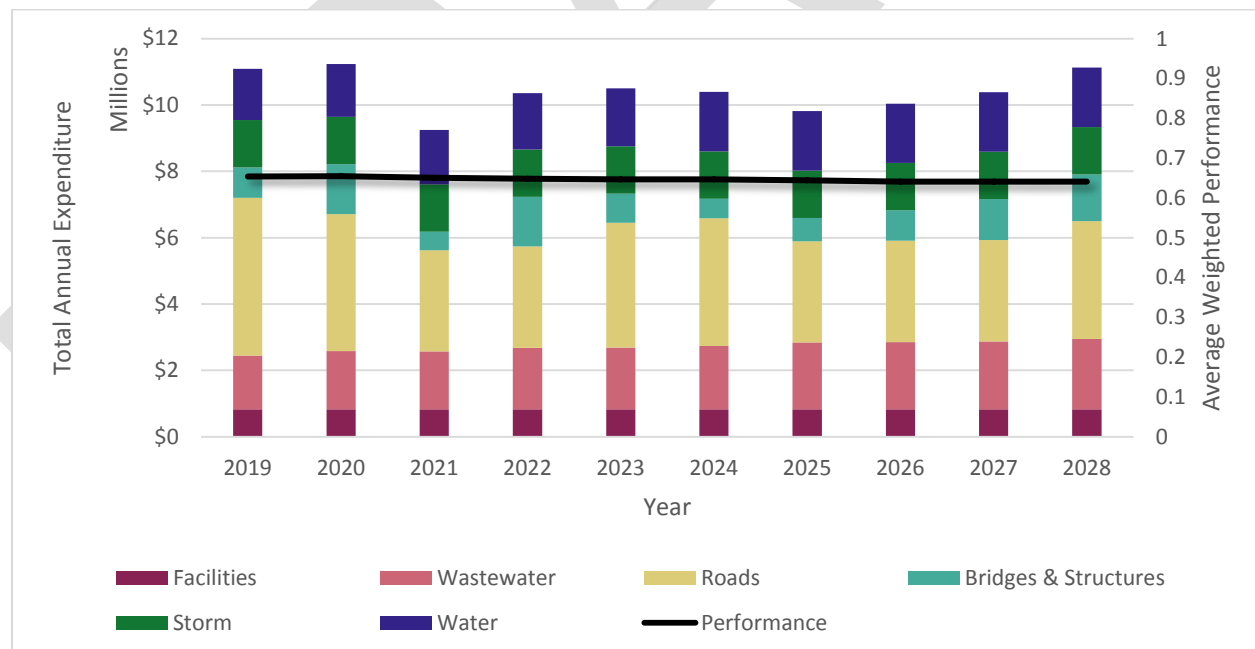


Figure 18: Recommended 10 Year Capital Plan

As this graph illustrates, this recommended 10-year capital plan should maintain the average performance of the system above 0.6 (Good) over the next 10 years (water asset performance was not factored into this average as a comparable performance was not forecasted). The performance of the system can be further maintained through ongoing preventative maintenance of the assets. In addition, this analysis can be further refined to provide more accurate forecasts of infrastructure needs through the collection of condition, replacement costs, and estimated service life data, and through the development of lifecycle curves and strategies.

5 FINANCING STRATEGY

This strategy ensures the process for linking asset plans to financing is in place, as committed to in the Asset Management Policy. Having a financial plan is critical for putting an asset management plan into action. In addition, by having a strong financial plan, the Town can demonstrate a concerted effort to integrate asset management planning with financial planning and budgeting and to make full use of all available infrastructure financing tools.

The financing strategy was built on the processes described below, which aids in fulfilling policy commitments for processes to ensure asset plans are aligned with financial plans and budgets.

5.1 Current and Planned Financial Strategies

The Town has developed a Long-Term Financial Plan (LTFP) Model which is a dynamic tool that incorporates all considerations from long-term capital and operating expenditures. The Town's financial analysts will be able to understand the impact of adjusting a range of funding strategies that relate to revenue and the expected change to expenditures from adjusting services or implementing planned infrastructure projects. The LTFP Model was not intended to replace existing operating budgeting, capital planning, or assessment growth projecting processes but rather augment existing processes by providing a longer-term perspective to inform decision making.

The LTFP Model uses conventional accounting formula to track operating revenues and expenditures, debt and debt service obligations, reserves, etc. A 30-year planning horizon was used in the LTFP Model instead of the lifecycle period of the assets. This is an optimal timeframe for financial analysis as costs tend to appear increasingly skewed due to inflation when applying a planning horizon beyond 30 years. There tends to be volatility in 10-year plans, therefore years 11 to 30 are used to illustrate the financial trend that the Town is moving toward.

Several variables were used to project the finances over the planning horizon, including:

- Inflation rates for operating costs and capital costs;
- Specific escalation rates for each type of revenues (property taxes, user fees, etc.); and
- Assessment growth forecasts based on population increase assumptions.

The details of the LTFP Model are provided in Technical Memorandum 8. The current and planned revenues and expenditures are provided in Figure 19 to 20 and

Table 11. The annual capital reinvestment rates are summarized in Table 12 and compared against the Canadian Infrastructure Report Card.

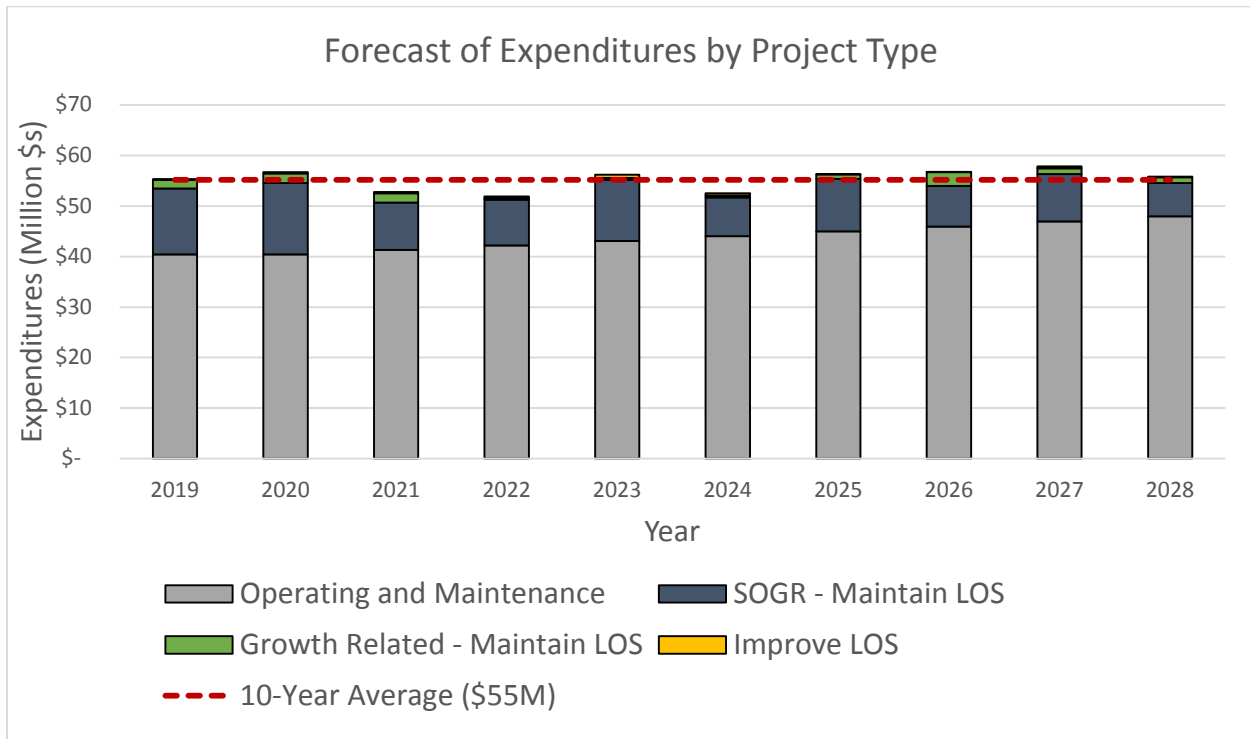


Figure 19: Expenditure Forecast

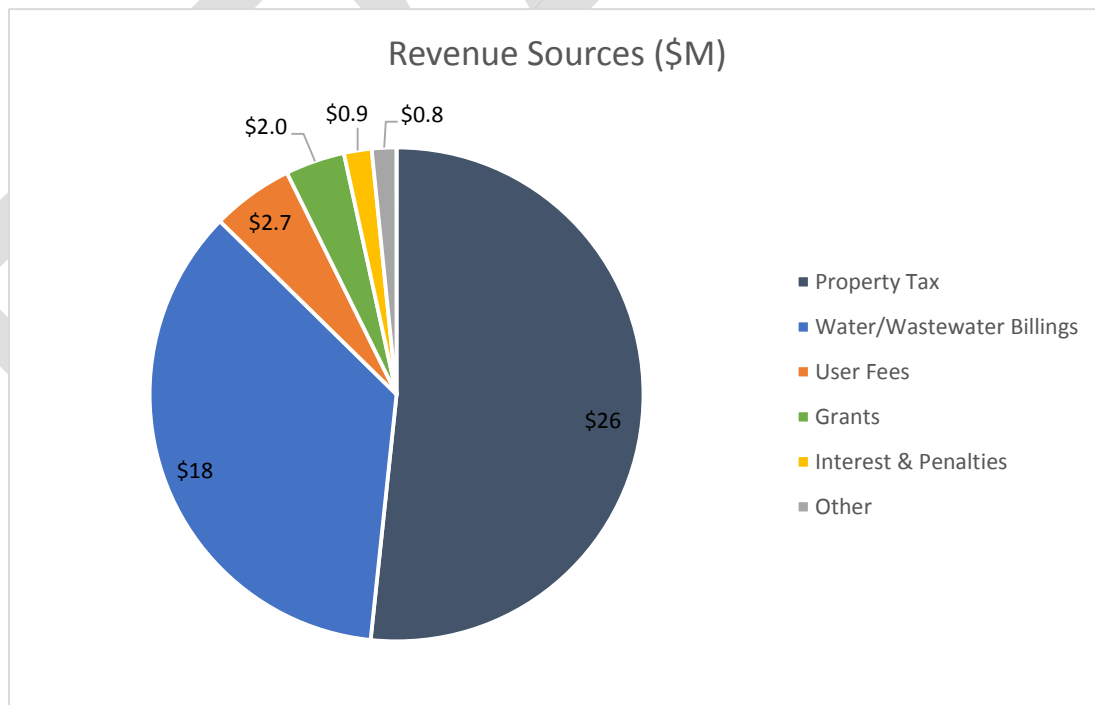


Figure 20: 2018 Revenue Breakdown

Table 11: Revenue Forecast

Revenue Sources (\$M)	2018	2019	2020	2023	2028
Property Tax	\$26	\$27	\$28	\$30	\$33
Water/Wastewater Billings	\$18	\$19	\$19	\$20	\$23
User Fees	\$2.7	\$2.5	\$2.6	\$2.7	\$2.8
Grants	\$2.0	\$1.8	\$1.8	\$1.8	\$1.8
Interest & Penalties	\$0.9	\$0.9	\$0.9	\$0.9	\$1.0
Other	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8

Table 12: Annual Capital Reinvestment Rates

Asset Category	Current 10-Year Reinvestment Rate	Canadian Infrastructure Report Card
Bridges & Structures	2.7%	1.0% - 1.5%
Facilities	0.8%	1.7% - 2.5%
Roads & ROWs	0.9%	2.0 - 3.0%
Sanitary	1.2%	1.0 - 1.3%
Stormwater	0.8%	1.0 - 1.3%

5.2 Infrastructure Gap

Traditional Asset Management Plans have used an age-based analysis to forecast the infrastructure needs and identify an “infrastructure backlog” which is the replacement value of the infrastructure that exceeds its service life. The new approach that aligns with O.Reg. 588/17 is to first quantify the current level of service being provided by the infrastructure systems and then to forecast the impact of current spending levels on service levels. The infrastructure gap is now determined as an annual funding shortfall to maintain current or achieve proposed LOS, rather the traditional ‘backlog’ of replacement needs.

The infrastructure gap was identified to be an annual \$420K as summarized in Table 10. The 2019 water and wastewater revenue were projected to be \$18.9M. A 2.2% revenue increase would be required, on top of inflationary and other approved increases, to fund the additional \$420K of related capital expenditures. It should be noted that the infrastructure gap for Sanitary may change as the Town completes the CCTV inspections over the next 10-years as recommended by the 2019 Wastewater Master Plan. These inspections will provide condition data to inform the expenditure needs rather than the current age-based analysis.

5.3 Planned Actions/Implementation Plan

The Town has been provided the LTFP Model with the scenario that addresses the additional capital expenditures starting in 2020. Since the current plan did not account for the increased expenditures, there were not enough funds within the reserves to finance the additional capital expenditures. Thus, the model was adjusted to increase the contributions from operating to ensure there were reasonable amount of funds remaining in the reserves, resulting in a deficit for the operating budget. The revenues in the model were increased until the operating budget was no longer in a deficit position.

The following scenarios were analyzed:

- Scenario 1 - Close the infrastructure gap over 3-years; and
- Scenario 2 - Close the infrastructure gap over 10-years.

In Scenario 1, the capital expenditures were gradually increased over the 3-year period and the deferred expenditures were spread over the following 7 years. Thus, the total expenditures for the 10-year period were equivalent. An additional 1% rate increase was required to fund Scenario 1, on top of inflationary increases, for 3 years from 2020-2022. Water and wastewater rates could then resume to inflationary increases.

Similarly, Scenario 2 had the same gradual increase but over 10-years and the deferred expenditures were spread over the following 10 years. The 30-year average annual expenditures were the same for both scenarios. The increase required to fund Scenario 2 was an additional 0.5% increase to rates, on top of inflationary increases, for 6 years from 2020-2025. Water and wastewater rates could then resume to inflationary increases.

It is prudent to consider the faster rate increase to close the annual funding gap to sustain the current LOS provided by the systems in a shorter time. Therefore, Scenario 1 is recommended to minimize the risk of deferred capital expenditures.

If future updates to the Town's AMP result in larger expenditure needs to achieve proposed LOS, the following strategies can be considered to fund the infrastructure gap:

1. Property tax levy dedicated to infrastructure renewal

Dedicating a portion of the property tax levy to fund infrastructure renewal activities in the Town is one of the best strategies to fund infrastructure needs. This approach provides a more direct line of sight from the taxes that residents pay to the services/infrastructure that it funds. The Town currently applies this approach by allocating a portion of the level to the capital reserves that are used to fund infrastructure renewal activities.

2. Increase Other Revenue Sources

Another option is to increase User Fees, Fines, or other non-property tax revenue sources. These increases can be in conjunction with a general tax levy increase to lessen the burden on property owners.

3. Continue to pursue Provincial/Federal grants

Both the Ontario and Federal governments have established substantial programs to fund the rehabilitation or replacement of municipal infrastructure. The grants are typically awarded to fund specific projects through an application-based system. The ad-hoc funding of specific projects through these types of grants will lower the overall magnitude of capital dollars that will need to be funded through the reserve accounts.

4. Leverage Public-Private Partnerships

In some cases, it may be feasible to fund infrastructure renewal projects by leveraging private capital funds through a public-private partnership (P3). Similar to the impact of receiving grants, the funding of specific projects through a P3 will lower the overall magnitude of capital dollars that will need to be funded through the reserve accounts. However, it should be noted that P3s are typically applied in large or complex infrastructure projects. The strategy would not be appropriate for routine infrastructure renewal activities, but may be an option for large discrete infrastructure projects (recreation center, bridge, etc.).

6 STAKEHOLDER CONSULTATION AND COMMUNICATION

External stakeholders include the Town's residents, businesses, investors, local communities, regulatory bodies, and any other customers. External stakeholders expect that the services provided by the Town in general are safe, reliable, accessible, high quality, operational, environmentally conscious, and provided in a cost-efficient manner.

Data used to develop the AMP is made available online to the public, subject to privacy or other legal restrictions as applicable. Under O. Reg. 588/17, the approved Policy and AMP will be posted on the Town website and provided to any person who requests this information.

The Town also ensures communication on AM options or decisions with all stakeholders, especially those with connected or related infrastructure (e.g. Region of Niagara, neighbouring local municipalities). This is a policy commitment and is regular practice through staff communication.

The Town strives to work with the Public and stakeholders to ensure their concerns and aspirations are considered or directly reflected in the options considered. Workshops, polling, public notices, and social media posts are several of the forums that may be used for engaging with the public and stakeholders.

Internal Stakeholders are primarily the Town's elected officials and staff. Internal stakeholders have recognized that continued AM will provide value to many areas of the Town's business. It will assist in coordination among departments, provide a better understanding of asset needs, and provide better evidence that can be used in decision-making activities that support delivery of services.

7 REVIEW AND CONTINUAL IMPROVEMENT

7.1 Review and Approval

Asset management for the Town of Fort Erie is continually evolving and maturing. The AMP will be updated as the capital needs and priorities of the Town change, and as legislative requirements and the Town budget process proceed.

Monitoring and maintaining the AMP is an important task. Staff will annually re-assess the Policy, Strategy, and AMP to ensure it is:

- Suitable – right or appropriate for the current and future conditions and culture at the Town of Fort Erie.
- Adequate – satisfactory and acceptable in quality, as defined by the regulatory and guidance requirements for municipal asset management.
- Effective - successful in producing a desired and intended result, fulfilling a specific long-term asset forecasting and planning function for the Town.

Table 13 below details the frequency of required AMP review and approvals.

Table 13: AMP Review and Approval

Action	Mechanism for Implementing Action	Frequency	Responsibility
Review of AM progress, including: (a) the municipality's progress in implementing its asset management plan; (b) any factors impeding the municipality's ability to implement its asset management plan; and (c) a strategy to address the factors described in (b).	Report to Council	Annually, before July 1st	Asset Management Coordinator prepares review, reports to Asset Management Lead Asset Management Lead prepares and delivers summary report to Council

Action	Mechanism for Implementing Action	Frequency	Responsibility
Review of suitability, adequacy and effectiveness of AMP	Report to AM Lead	Annually, before July 1st	Asset Management Coordinator reviews and prepares recommendations for AM Lead
Update AMP accordingly	Update asset information and run analyses Update business processes, if required Report to Council	At least every five years, or as required	Asset Management Coordinator
Review of AM Policy & Strategy	Report to AM Lead	Annually, before July 1st	Asset Management Coordinator reviews and prepares recommendations for AM Lead
Update Policy & Strategy accordingly	Update Policy and Strategy, if required Report to Council	At least every five years, or as required	Asset Management Coordinator

The AMP is endorsed by the Asset Management Lead and approved by a resolution passed by Council.

In addition, the performance of LOS measures shall be specifically reviewed on an annual basis and monitored. This will provide the Town with a continued understanding of the relationship between cost and LOS, which will be used to set proposed targets for each performance measure by 2024.

7.2 Continual Improvement

As asset management practices evolve, so will the completeness and effectiveness of this AMP. The following tasks will ensure the AMP continues to improve over time:

- Through annual reviews defined above, staff will identify areas within the AMP with opportunity for improvement and areas that may be deficient. Staff will define an action plan to address these issues and report to the Asset Management Lead accordingly.
- Staff will continue to work towards keeping information and supporting data updated and gathering comprehensive and quality data for smaller asset classes.
- Efforts to continue to develop staff competence and improve the AMP, and staff will attend training and consult AM resources as appropriate.

8 RECOMMENDATIONS

8.1 AMP Data Management Plan

It is recommended that the Town develop a formalized data management plan to support the development of subsequent Asset Management Plans (AMP) over the short term. The requirements and steps necessary to complete the data management plan are outlined below.

➤ Business Process / Workflow Development

The data management plan will outline processes for the collection, maintenance, and aggregation of data for use within the AMP. Reviewing current processes will be necessary to understand how data is currently handled and determine where changes are required, or if improvements can be made to better align with AMP requirements.

➤ Outline Roles & Responsibilities

The data management plan should also outline the roles and responsibilities for key staff involved in developing the AMP. Recommendations have been provided on the resources necessary for AMP development in Technical Memorandum #10: Recommended Future Staffing Structure and AMP Requirements (combined with Technical Memorandum #2). The previously developed workflows can be used to identify who is responsible for each action, including data collection, data verification, data management, data aggregation, etc.

8.2 Data Management and Business Process Improvement

The following represents a step wise approach to the development of an asset centric, evidence-based asset management environment at the Town. This approach focuses on addressing fundamental data fidelity, ownership, and maintenance issues before considering software needs, as most of the issues / frustrations expressed by staff are not software centric, rather fundamental business process and data management issues.

A full description of scope and estimates of resource needs for each recommendation are outlined within Technical Memorandum 9, provided in Appendix H.

➤ Document Existing Data Sources, Authors, Contributors, and Consumers

The first step in bringing efficiency and clarity to data management efforts at the Town is to explicitly document the “as is” state with respect to supporting data. This process will involve defining and deciding on the: location and format of supporting data, its suitability as the authoritative source, identifying duplicates, accountability and ownership of the data, and currency and frequency of update. This will aid in defining what information is available, highlighting any inefficiencies with respect to its upkeep

and the extent to which the data can be used by multiple stakeholders for complementary, yet different, functional needs. The source, accuracy, and currency of new incoming information will be required along with roles for staff on its upkeep and ownership.

This process needs to be mindful of and respect the fact that there are many “expert systems” currently in use at the Town which, in addition to housing asset information, produce functional use specific output for specific tasks. Examples of these systems include but are not limited to: financial systems, water and wastewater hydraulic models, pavement management systems, etc.

Outcome: Data and Roles Register

➤ Document Existing and Future Functional Needs

The completion of the preceding task will clearly define what data is available, its maturity, and confidence for use by Town staff. Under this task, a broad cross section of Town staff need to discuss, define, and document their functional needs with respect to: work management, asset planning, budgeting, and reporting.

In defining these needs the following needs to be considered:

- Criticality of functional use – is it a “want” or is it a business-critical need?
- Frequency of use – annual, monthly daily?
- Required level of detail for each use – some differing uses may employ the data, however at differing levels of detail
- Primary consumer of the data for a given functional use
- Primary and secondary sources of data for functional use
- What and how many data sources are accessed to meet the need

The documentation of these needs will provide the basis to match functional need with the data that is available. This process will clearly result in the gaps between the required needs of stakeholders and the data that is available, current, and reliable.

Outcome: Functional Needs Documentation

➤ Defining Gaps, Consolidation, and Rightsizing Opportunities

Upon completion of the functional use assessment, the Town will have the ability to compare business critical needs against available data. This will also allow for a review of existing data from a “to be” or optimized state. A thorough data review should follow to examine opportunities for:

- Disposal of data that does not address a defined need.
- Aggregation and consolidation of data to meet functional needs, ideally from one maintainable and authoritative information source.

- Definition of owner, author, update frequency, and schedule of update for core asset: inventory condition, capacity, risk, and valuation data.
- Data that requires augmentation, or conversely, simplification to meet a functional need.
- System integration opportunities.
- Location of data source either within or outside of an expert system.

This will result in a data improvement plan that is clearly coupled with functional need. Needs should ideally be prioritized to allow for the recognition of some quick wins along with a data project management plan with clear resource requirements and deadlines. Results need to be documented and made explicit to all stakeholders to keep expectations in check with the planned data improvement schedule.

The ownership or accountability for the data improvement plan should ideally rest with senior staff within the division or department with the authority to act on or direct staff for data improvement. The owner of the plan should ideally be a subject matter expert on the data. Improvement plans can be coordinated amongst departments if there are named owners for all components and one senior staff member who has the authority to act on the overall plan. Data improvement plans are generally living documents and centre around the ongoing audit and revaluation of data versus core business functional needs.

Outcome: Functional Needs Documentation

➤ **Definition of Data Improvement Plan and Resource Requirements**

The aggregate of the assessments resulting from the preceding will form the basis for a data improvement plan along with required resources. At this juncture, the GMBP team does not have sufficient information to support an accurate assessment of the resources required to fully build out the Town's data sets, however, an estimate has been provided for core water, wastewater, structure, drainage, and stormwater data sets which do require some augmentation. Other functional areas and departments, parks etc., will likely require additional effort.

Outcome: Data Improvement Plan

➤ **Definition Data Intake Standards**

The Town, like most municipalities, relies on outside vendors to supply information deemed critical for AM planning. Examples of this include but are not limited to the following:

- Design and construction of new assets.
- CCTV of wastewater and stormwater networks.
- Procurement of equipment – significant component assets.

- Inspection and condition assessment services.

Effective data management, with limited staff resources, will require Town staff to put the onus of the construction of data sets consistent with data structures in use at the Town on vendors. This will avoid resource inefficient transposition of data into Town systems. Town AM staff will then become validators and analyzers of data versus authors.

The construction of standards should begin immediately after a final structure for each asset type is defined. Town staff should leverage those standards already in place at different locales: Region of Waterloo, Regional Municipality of Wood Buffalo, etc. and alter them to meet their needs.

Outcome: Incoming Data Intake Standards

➤ **Development / Population of Centralized Asset Data Register**

This task will involve the aggregation, centralization, and consolidation of the core asset inventory attributes and spatial information into one accessible source for all stakeholders and expert systems to access. Careful regard should be paid to that which should remain in an expert system versus those attributes considered core e.g., asset type, unique identifier, material of construction, date of construction, symbol, GIS geometry, etc. For those assets that are managed independently (e.g. Fleet, facilities etc.) where no or limited interaction with other systems is required, those inventories should remain in the host system.

It is understood that the Town of Fort Erie will be transitioning from a Manifold to an ESRI based corporate GIS framework. GMBP recommends that the Town evaluate the Canadian Municipal Data Model as an Asset Register, given its high functionality with embedded ESRI software applications. It is understood that local area municipalities of similar sizes, Grimsby, Welland, etc., either have or will be implementing this data model. This common back end should result in efficiencies with respect to application development and sharing with other municipalities.

The implementation of this, or any data model, should be evaluated against existing software in place at the Town and possible future software purchases.

Outcome: Asset Data Register

➤ **Define, Amalgamate Requirements, and Develop Software Functional Specifications**

Although a summary review of needs has been completed through this project for various type of software, defining the full business needs and the associated software

requirements from all stakeholders is essential prior to the introduction of any software to ensure that it provides value to the Town.

This process should involve a full needs review with key stakeholders from all staff groups that will be using the software to obtain early buy-in. The prioritization of these needs must distinguish between mandatory and optional (future) requirements and the development of functional specifications to evaluate software suitability. This process should be combined with a Business Requirements Document.

A final, however very important, consideration for any upcoming software purchase is that all software being purchased must be able to integrate with the asset register, where necessary, and have an open and published Application Program Interface (API) which will ensure that data collected within the system is easily accessed and not held hostage by the software vendor.

Outcome: Business Requirements Document(s)

GMBP strongly recommends these steps be completed prior to procuring any software solution(s). This initial investigation will provide the necessary understanding and documentation to justify the requirements, as well as detail the user functionalities required in any software system.

8.3 Software Recommendations

The following software recommendations assume that the preceding data management and business process issues have been resolved and outcomes as described have been achieved.

The optimum asset management state at the Town will be the development of asset centric and evidenced based short to long term capital and operations plans. In order to achieve this state, the Town will require comparative metrics at an asset level for the following:

- Defined customer and technical levels of service
- Replacement and renewal triggers for assets
- Core attributes for each asset they own (Asset Register)
- Replacement, remediation, maintenance, and repair costs
- Risk on a predefined scale
- Capacity
- Condition

To achieve this optimized state, the Town will be required to capture and store information at the asset level, in any system, using predefined master identifiers or IDs used within an Asset Register. This will allow for the aggregation and analysis of all metrics, existing “as is” to preferred “to be” state.

To facilitate the development of the “to be” state, assuming the CMDM or generic equivalent is used for an Asset Register, the following two systems should be considered.

Corporate Maintenance Management Work Order System (MMWS)

Timing:	1 to 3 years
Capital Cost:	\$150,000 - \$200,000
Implementation Cost:	\$450,000 - \$800,000
Total:	\$600,000 - \$1.0M
Annual Cost:	(25 to 30% of Software Purchase Cost)

Currently the Town lacks a thorough understanding of the type, extent, and distribution of costs at an asset level for the majority of the asset portfolios, both within and outside of the scope of this project with the exception of buildings for which Fiix has been purchased and implemented. In addition, the Town does not have a full understanding of the frequency and cause of failure that results in their current largely reactive maintenance state.

The introduction of a modern, geospatial, mobile, and web based MMWS will provide significant benefits in the following areas:

- The construction of an ongoing, centralized, and staff member independent maintenance corporate memory
- Understanding what maintenance money was spent on, an asset, versus knowing purely what activity was involved.
- Provide core asset information, past and planned maintenance, and capital activity data to front line workers allowing them to make better informed decisions in the field.
- Preservation of asset life through proactive, preventive maintenance.
- Efficiencies through the movement away from a reactive to planned maintenance state. Identification of reactive maintenance that can be grouped into preventive planned maintenance programs with defined resources and budgets.
- Identification of assets that require capital intervention versus repeated maintenance.
- Identification of aggregate maintenance costs and frequency by asset. Understanding the root cause of asset failure or assets that fail to perform at the desired level of service.
- Provide a structured method for operators and maintainers to inform capital and operations budgets and authors.

- Provide a structured environment for asset inspection data and attachment of media.
- Inform level of service key performance indicators.
- Standardize and monitor customer response times by activity and ensure that the customer service loop is both auditable and closed.
- In most cases modern MMWS software also provides the following:
 - Fleet / rolling stock management;
 - Stores / inventory functionality;
 - Asset specific condition assessment and analysis functionality – CCTV, OSIM, PM, etc.;
 - GIS work planning; and
 - Financial and time analysis.

The introduction of a new MMWS should be viewed in the context of providing front line worker value first and foremost, as all the benefits listed can only be recognized if buy in at this level is achieved and data captured appropriately.

Please note that costs shown are for an “on premise” solution meaning that software would be installed on Town servers. The Town may opt for Software as a Service, (SAAS), web hosted, which provides economies through the use of a subscription-based model that does not require capital hardware investment. Ideally the MMWS being considered should include Customer Relations Management functionality to link service requests with inspections and work orders in one seamless and auditable environment.

Again, prior to the introduction of a new MMWS the Town must fully understand their current maintenance processes and streamline these to an optimized state. Failure to do so will result in digital representation of the existing state which will fail to recognize significant value. In addition, the Town should construct a functional and technical specification that outlines software needs for inclusion within a suitable RFP. This is not to be confused with a list of Information Technology driven requirements. A suitable example recently constructed by the GMBP for the City of Brantford has been included under separate cover.

Corporate Decision Support System (DSS)

Timing:	2 to 4 years
Subscription / Lease Cost:	\$25,000 to \$50,000 per annum
Implementation Cost:	\$100,000

This project has provided a non-proprietary SQL Server based DSS and financial tool for the Town’s use. The full functionality within this system has yet to be recognized

within one commercial DSS system, however, base functionality with respect to the creation and bundling of projects and programs for budgeting has. The Town can continue to use the installed systems with minor to no support from GMBP.

GMBP has provided peer review and implementation services for many products including but not limited to: Assetic, Power Plan, Copper Leaf, and others. Generally speaking, these systems provide a more intuitive user interface with base level optimized decision-making functionality, however, most require significant implementation effort around decision making trigger and financial calibration. All these systems do also provide adequate financial modelling. GMBP can provide additional information on these systems and their various pros and cons given our review of 8 commercially available systems as part of our Municipal DSS Working Group.

Non-Proprietary Tangible Capital Asset Reporting System and Templates

Timing:	1 to 2 Years
Development Cost:	\$45,000
Implementation Cost:	\$10,000
Annual Cost:	N/A

It is understood that the Town expends significant effort in the production of TCA reports on an annual basis. This effort appears to be due to the use of a proprietary TCA reporting system that requires:

- Manual synchronization / input of asset inventory records, acquisitions, disposal, write downs etc. between this system and engineering systems and tenders.
- Inordinate amount of effort to translate system output into financial forecasts and reporting. Treasury staff have indicated that this inflexibility also creates a loss of synchronization between the various information sources.

This project would include the development of templates for external and internal service providers to populate that would provide the essential components for financial reporting within a TCA and AM environment. These templates would make these values explicit and would significantly decrease the effort required for both AM and TCA purposes and the effort required to push incoming data into Town systems.

The second component of this project is the creation of a linked Excel based TCA reporting tool. This tool would connect to the Town's Asset Register, the definitive and singular source for asset information for the portfolios specified, and generate the reporting required for the Town's mandatory financial reporting while informing other AM and financial modelling systems within one nonproprietary and accessible information source.

Core Requirements for Additional Systems

The Town may opt for additional systems to inform their AM process over the short to medium term. The following requirements should be used in evaluating the business fit for any given application:

- Town data input into these systems must be accessible through linkages via an application program interface (API) to ensure that data is not held captive within a proprietary back end.
- Systems should be web based, mobile device optimized, and GIS ready in cases where field staff input / use is required.
- In cases where subscription-based Software As A Service Software is selected, escrow and data ownership/download agreements need to be put in place.
- In all cases the Town should pilot functionality with Town data with the vendor to ensure that the base software requirements are met.
- Standalone encrypted / proprietary core or expert systems should be avoided at all costs.

8.4 Data Collection to Support Future AMPs

To facilitate the augmentation of the Town's data to support the creation of future AMPs, it is recommended the Town define the protocol for data capture to document the data structure and attributes that are necessary for each asset group. Once defined, the recommended data collection should commence quickly thereafter. Based on the sheer volume of assumptions required to fill data gaps for the purposes of the AMP, specifically for condition data and installation years, GMBP strongly recommends the Town initiate a CCTV program for both wastewater and stormwater within the next year.

A full listing and roadmap for data collection projects is available in Technical Memorandum 1, available in Appendix B.

8.4.1 Collecting Data to Operationalize LOS Frameworks

The LOS frameworks clearly distinguish between foundational and advanced metrics. Foundational metrics include performance measures that use readily available asset data, such as operational and capital expenditures, and condition/age data. For the advanced metrics, more data and logic are required to connect the expenditures needed to forecast the measure over time. For example, once a Work Management System is implemented for roads, storm, and wastewater, the percentage of preventative maintenance activities completed on schedule can be tracked and extracted for determining LOS.

In addition, the frameworks highlight the LOS measures that are required under O. Reg. 588/17. These measures include qualitative descriptions and technical metrics that

need to have the current performance defined by 2021. The Town met internally to confirm how these measures were interpreted and defined based on available data, as well as temporary solutions for metrics that the Town does not currently have data available for. For example, until a stormwater hydraulic model has been developed the Town may choose to define property resiliency based on the proximity to stormwater infrastructure. Where data is not available, the Town will need to begin collecting and tracking this information.

The refinements to the available LOS data that are described below should be prioritized and planned by the staff responsible for asset management, in collaboration with subject matter experts. In some cases, it may be feasible to complete the refinements using internal Town staff resources through incorporation into existing work planning processes. If the Town does not have sufficient resources then consideration should be given to retaining additional support through the procurement of external resources. Activities to refine or collect data may include, but not be limited to:

- New data collection;
- Digitizing existing data; and
- Data processes/analysis of existing data.

The different types of recommended projects/activities required to operationalize the LOS Frameworks is summarized in Table 15.

Table 14: Recommended Projects to Operationalize LOS

Service Category	Recommended Project / Activity	Description
All or Several Service Categories	Annual Update to Financial Analysis	Analyze operating and capital budgets annually to determine the amount of annual expenditures for each service category.
	Ongoing Asset Management Analysis	Develop the ability to apply asset management strategies (lifecycle rehabilitation/replacement options, degradation analysis, etc.) to the available asset data and financial analysis. This will enable the Town to forecast the foundational metrics immediately and the advanced metrics once the data is available. Asset management analysis includes spatial analysis of the asset inventory for the frameworks with spatial metrics. This capability will support the Town in their efforts

Service Category	Recommended Project / Activity	Description
		to be in compliance with O. Reg. 588/17.
	Customer Relationship Management System (CRM)	Update the processes to collect, store, and analyze feedback/complaints from the community. The system should have the ability to tie feedback to both a service area and specific asset, and outline if infrastructure needs were identified.
	Work Management System (WMS)	Implement a WMS for Roads, Storm, and Wastewater and connect the Town's work order management system so available data can be fed into the system to help capture and analyze the operation and maintenance expenditures on assets across the corporation and support the population of many advanced metrics in the LOS Frameworks.
	Customer Satisfaction Survey	The Town should complete a survey of the community every 5 years to understand their satisfaction of Town services, including understanding residents' satisfaction with traffic flow and the accessibility of road assets. Many of the advanced customer metrics require feedback from the public to understand how service meets their expectation. Ongoing and repetitive public survey is critical to provide consistent trending over time.
	Field Survey	Additional data collection is required to populate some of the performance measures in the LOS Frameworks.
	Internal Service Level Agreement	Internal department workshops to maintain and adjust targets and asset management analysis.
Stormwater	Stormwater Master Plan	The Town should undergo a Stormwater Master Plan Study in the near future. This Study is an ideal opportunity to collect data

Service Category	Recommended Project / Activity	Description
		and develop the processes to operationalize the performance measures in the LOS Framework.
	Stormwater Hydraulic Model Update	Once data collection has been completed for the stormwater system, a stormwater hydraulic model should be created to determine the resiliency of the stormwater network. This will support the Town in their efforts to be in compliance with O. Reg. 588/17.

8.4.2 Recommended Future Staffing Requirements

In order to ensure the Town has the resources to maintain and amalgamate the required data and perform the required analyses on an ongoing basis, the following recommendations for required roles and responsibilities have been provided. The Town will be required to determine whether these roles should be completed part time by existing staff, or if new fulltime roles should be created and filled; these roles include:

1. An **asset management professional** (1 FTE) who understands both the strategic and operational perspectives of what the system can do and how it can be refined. This individual should be considered an integrated asset management expert, directing the development, implementation, and sustainability of asset management processes in the organization. Amongst other responsibilities, the position will be required to liaise with IT, Finance, and subject matter experts to refine the system (updating costs, condition, etc.) in the short term and sustain it in the long term, as well as run outputs from the analysis. The core requirements for this position should include an engineering/infrastructure/financial education, financial experience, leadership experience, and executive facilitation skills. This role should have the authority to recommend overall asset management strategy to Council.
2. A **computer programming professional** (0.5 FTE) with an ability to develop queries in SQL based programming languages. This position will be responsible for adjusting algorithms under the direction of the integrated asset management professional, as well as managing the native data – SQL server – Excel connectivity.

The following points summarize the typical activities for these staff:

- Liaising with the subject matter expert staff to improve how asset data/information is collected and used.

- Liaising with the subject matter expert staff to adjust the approach to analyzing asset data within the system.
- Coordinating the adjustment of the analysis in the system to continually improve the relationships between the expenditure needs and the performance of the assets.
- Advancing the measurement of asset performance to go beyond the current approach of using primarily asset condition information.
- Liaising with the City's finance team to refine how the capital budget and capital project sheets are developed to better support the analysis of planned expenditures on the performance of the assets.

In the long term, the estimated FTE may need to be increased as the scope of the AMP will broaden over time to include all assets within the Town (required by 2023) and will result in an increased need for resources over time. This may include additional resources required within the Finance/Corporate Services group that would be responsible for AMP management including updating and interpreting the results of the LTFP.

APPENDIX A: LOS TABLES

APPENDIX B: TECHNICAL MEMORANDUM #1 - BACKGROUND REVIEW AND GAP ANALYSIS

**APPENDIX C: TECHNICAL MEMORANDUM #2 - AMP STAFFING
& STAFF ENGAGEMENT**

**APPENDIX D: TECHNICAL MEMORANDUM #4 - STATE OF
LOCAL INFRASTRUCTURE**

**APPENDIX E: TECHNICAL MEMORANDUM #5 - LEVELS OF
SERVICE DEVELOPMENT**

**APPENDIX F: TECHNICAL MEMORANDUM #6/7 - TEN YEAR
CAPITAL PLAN & INVESTMENT PLAN**

**APPENDIX G: TECHNICAL MEMORANDUM #8 - FINANCIAL
MODEL AND PLAN**

**APPENDIX H: TECHNICAL MEMORANDUM #9 -
RECOMMENDATION OF SOFTWARE**

**APPENDIX I: TECHNICAL MEMORANDUM #12 - DATABASE
ANALYSIS AND LOGIC**

Appendix '2' to Administrative Report IS-21-2019

Asset Levels of Service Framework

Service Category: Bridges & Structures

Service Statement: Efficiently providing operational and accessible bridges at the appropriate quality that support drivers, cyclists and pedestrians.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing bridges and structures in an efficient manner	Annual cost to provide service (\$/household)	\$156/household	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$156/household	-	Annual operating budget for bridges and structures	TBD	Operating Budget	TBD	↑
							Average annual capital expenditure for bridges and structures	\$1,019,245	Capital Budget - 2018 Budget Book (PDF)	\$1,019,245	↑
		Average bridge and structures renewal rate (# years)	37 years	Asset Management Forecaster (Excel)	37 years	-	10 Year average bridges and structure asset renewal budget as a % of replacement value	2.7%	Capital Budget - 2018 Budget Book (PDF)	1% - 1.5%	-
Operational	Providing operational bridges and structures that are safe for drivers, pedestrians and cyclists	# of vehicle, cyclist, and pedestrian incidents (complaints)	21	CRM Export (Excel)	TBD	↑	# of accessibility complaints of bridges and structures	0	CRM Export (Excel)	TBD	↑
							% of reactive work completed within (TBD) days	TBD	CMMS (once implemented)	TBD	-
							% of planned maintenance activities completed as per schedule	TBD	CMMS (once implemented)	TBD	-
							# of bridges that negatively impact the hydraulic capacity / flow of the watercourse	TBD	Ellis 2017 Engineering Report (PDF)	TBD	↑
Quality	Providing operational bridges and structures that are safe for drivers, pedestrians and cyclists	The general condition of bridges, and how general condition affects overall bridge use in Fort Erie	On average, the majority of bridges are in good condition, thus providing reliable bridge availability to the public.	SOGR TM	On average,majority of bridges in good condition, thus providing reliable bridge availability	-	For bridges in the municipality, average bridge condition index value.	69	Bridge Inspection Excel Export	58	↓
	Providing operational bridges and structures that are safe for drivers, pedestrians and cyclists	The general condition of culverts, and how general condition affects overall culvert use in Fort Erie	On average, the majority of culvert assets are in good condition, thus providing reliable culvert availability to the public.	SOGR TM	On average,majority of culverts in good condition, thus providing reliable culvert availability	-	For structural culverts in the municipality, average bridge condition index value.	68	Bridge Inspection Excel Export	57	↓
Scope	Providing an accessible transportation network to the public	Traffic that is supported by Fort Erie bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	All ranges of traffic types are supported by almost all bridges, unless otherwise posted.	Engineering	All ranges of traffic types are supported by all bridges wherever practicable.	-	% of bridges in the municipality with loading or dimensional restrictions	2.0%	Bridge Inspection Excel Export	2.0%	-

- Foundational Metrics
- Advanced Metrics
- O.Reg 588/17 Metrics

Asset Levels of Service Framework

Service Category: Roads and Right-of-Ways
Service Statement: Efficiently providing operational and accessible roads at the appropriate quality that support drivers, cyclists and pedestrians.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing an efficient transportation network for all modes	Cost to provide service (\$/household)	\$467/household	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$467/household	-	Annual operating budget for roads	\$4,540,515	Operating Budget	\$4,540,515	↑
							Average annual capital expenditure for roads	\$3,054,000	Capital Budget - 2018 Budget Book (PDF)	\$3,054,000	↑
		Average asset renewal rate (# years)	117 years	Consultant Report (TBD)	117 years	-	10 Year average road linear asset renewal budget as a % of replacement value	0.9%	Capital Budget - 2018 Budget Book (PDF)	2% - 3%	-
Operational	Providing an operational road network that is safe for drivers, pedestrians and cyclists	# of vehicle, cyclist, and pedestrian incidents (complaints)	1,731	CRM Export (Excel)	TBD	↑	# of infrastructure needs identified from complaints of unsafe roads	TBD	TBD (CRM does not identify infrastructure needs)	TBD	↑
							% of reactive work completed within x days	TBD	CMMS (once implemented)	TBD	-
							% of planned maintenance activities completed as per schedule	TBD	CMMS (once implemented)	TBD	-
							# of road defects identified	906	CRM Export (Excel)	TBD	↑
							% of time when MMS are achieved as per O. Reg 366/18	TBD	CMMS (once implemented)	TBD	↑
Quality	Providing a transportation network at the appropriate condition with smooth and safe surfaces	# of customer service requests relating to service quality	1,189	CRM Export (Excel)	TBD	↑	% length of paved roads in poor or very poor condition	8.1%	Road Inventory (DOT)	1.9%	↓
							% length of unpaved roads in poor or very poor condition	90.2%	Road Inventory (GIS) - Age-based	10.3%	↓
							% length of sidewalks in poor or very poor condition	5%	Sidewalk Inventory (GIS)	TBD	-
							% of streetlights in poor or very poor condition	0%	Streetlight Inventory (GIS)	TBD	-
							% of other road and right-of-way assets in poor or very poor condition	TBD	TBD	TBD	-
		Levels of road class pavement condition	Range of minor arterial, collector and local roads, classes 0 and 3-6, in earth, gravel, surface treated and asphalt, in conditions that are poor, fair, good or excellent.	DOT	Range of minor arterial, collector and local roads, classes 0 and 3-6, in earth, gravel, surface treated and asphalt, in conditions that are poor, fair, good or excellent	-	Average surface condition (e.g. excellent, good, fair or poor) for paved roads.	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	Road Inventory (DOT)	Excellent	↑
Accessible	Providing an accessible transportation network	Road network in the municipality and its level of connectivity	Good connectivity of a range of minor arterial, collector and local roads throughout the Town.	Engineering	Good connectivity of a range of minor arterial, collector and local roads throughout the Town	-	# of lane-kilometres of arterial roads as a proportion of square kilometres of land area of the municipality.	0.348	Road Inventory (GIS)	0.348	-
							# of lane-kilometres of collector roads and local roads as a proportion of square kilometres of land area of the municipality.	4.607	Road Inventory (GIS)	4.607	-
							# of lane-kilometres of local roads as a proportion of square kilometres of land area of the municipality	4.014	Road Inventory (GIS)	4.014	0
		% of road assets that are AODA compliant	TBD	TBD	TBD	-	% of sidewalks that are AODA compliant	TBD	TBD	TBD	-
							% of traffic signals with APS	TBD	TBD	TBD	-
Environmental Stewardship	Providing a transportation network that is environmentally conscious	% of streetlights that are energy efficient	TBD	TBD	TBD	-	% of streetlights with LED or low energy fixtures	TBD	TBD	TBD	-
		Volume of salt applied to road/lane km	2.65	Salt Management Plan (Annual Report to Environment Canada)	TBD	-	Volume of salt applied to road/lane km	2.65	Salt Management Plan (Annual Report to Environment Canada)	TBD	-

- Foundational Metrics
- Advanced Metrics
- O.Reg 588/17 Metrics

Asset Levels of Service Framework

Service Category: Stormwater
Service Statement: Efficiently providing reliable stormwater services that protect the community and natural environment.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing stormwater services in an efficient manner	Annual cost to provide service (\$/household)	\$218/household	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$218/household	-	Annual operating budget for stormwater	TBD	Operating Budget	TBD	↑
							Average annual capital expenditure for stormwater	\$1,428,000	Capital Budget - 2018 Budget Book (PDF)	\$1,428,000	↑
		Average stormwater asset renewal rate (# years)	109 years	Operating Budget Capital Budget - 2018 Budget Book (PDF)	109 years	-	10 Year average stormwater linear asset renewal budget as a % of replacement value	0.8%	Capital Budget - 2018 Budget Book (PDF)	1% - 1.3%	-
Reliable	Providing stormwater services with minimal impact to the community	# of locations in the Town prone to flooding during wet weather events	0	CRM Export (Excel)	TBD	↑	% of major system with insufficient capacity to convey flows of a 100-year wet weather event	TBD	TBD	TBD	-
							% of minor system with insufficient capacity to convey flows of a 5-year wet weather event	TBD	TBD	TBD	-
							# of complaints of flooding during a wet weather event	0	CRM Export (Excel)	TBD	↑
							% of major system with adequate resiliency to accommodate the impacts of climate change	TBD	TBD	TBD	-
							% of minor system with adequate resiliency to accommodate the impacts of climate change	TBD	TBD (SW Master Plan will determine this)	TBD	-
							% of town area surcharged	TBD	TBD	TBD	-
							% length of storm sewers in poor or very poor condition	24.5%	GIS (shp)	35.5%	↑
							% of other stormwater assets in poor or very poor condition	TBD	TBD	TBD	-
							# of critical roads where flooding exceeds 100 mm during a Regulatory storm	TBD	TBD (SW Master Plan will determine this)	TBD	↑
							# of properties at risk of being flooded during a target wet weather event	3	CRM Export (Excel) (SW Master Plan will determine this in future)	TBD	↑
		% of community with stormwater quantity control	TBD	TBD (SW Master Plan will determine this)	TBD	-	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity	TBD	TBD (SW Master Plan will determine this)	TBD	-
Environmental Stewardship	Providing stormwater services that protect the environment	% of community with stormwater quality control	TBD	TBD	TBD	-	# of SWM ponds that have exceeded their target dredging frequency	TBD	TBD	TBD	↑
							% of community with stormwater quality treatment control	TBD	TBD	TBD	-
							#/type of LID technologies implemented	0	TBD	0	↑
Scope	Providing protection from flooding due to ROW/infrastructure	User groups or areas of Fort Erie that are protected from ROW or infrastructure flooding, including the extent of the protection provided by the municipal stormwater management system	Some urban areas protected from ROW/infrastructure flooding through urban ditch system or underground storm collection, some with defined outlets. Most rural areas protected from flooding through provision of municipal drains or rural ditch systems, some with defined outlets	Engineering	Some urban areas protected from ROW flooding through urban ditch system or underground storm collection, some with defined outlets. Most rural areas protected from flooding through provision of municipal drains or rural ditch systems, some with defined outlets	-	% of properties in municipality resilient to a 100-year storm	TBD	TBD	TBD	TBD
							% of the municipal stormwater management system resilient to a 5-year storm	TBD	TBD	TBD	TBD

- Foundational Metrics
- Advanced Metrics
- O.Reg 588/17 Metrics

Asset Levels of Service Framework

Service Category: Facilities Management
Service Statement: Efficiently providing high quality, safe, accessible, and energy efficient facilities for the community.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing facilities management services in an efficient manner	Cost to provide service (\$/sqft)	\$3/sqft	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$3/sqft	↑	Annual operating budget for facilities management	TBD	Operating Budget	TBD	↑
							Average annual capital expenditure for facilities management	\$829,500	Capital Budget - 2018 Budget Book (PDF)	\$829,500	↑
		Average facilities renewal rate (# years)	119 years	Operating Budget Capital Budget - 2018 Budget Book (PDF)	119 years	-	10 Year forecast average facility asset renewal budget as a % of replacement value	0.84%	Capital Budget - 2018 Budget Book (PDF)	0.84%	-
							% of building elements currently in poor or very poor condition that can be renewed within the next 10 years	90.43%	2018 Condition Assessment (Excel)	90.43%	-
Safe	Providing facilities management services to ensure that facilities are safe	# of building/design related public safety incidents reported	TBD	TBD	TBD	↑	# of outstanding safety improvements required at facilities/100 sqft	TBD	TBD	TBD	-
							% of buildings annually inspected	TBD	TBD	TBD	-
							% of facilities that meet security standards	TBD	TBD	TBD	-
		OR					% of reactive work completed within x days	TBD	CMMS (once implemented)	TBD	-
		# of claims filed					% of planned maintenance activities completed as per schedule	TBD	CMMS (once implemented)	TBD	-
							# of building defects identified	TBD	TBD	TBD	↑
Accessible	Providing facilities management services to ensure that facilities are AODA compliant	% of facilities that meet the Town's accessibility objectives / goals		Accessibility Audits (PDF)	TBD	-	% of facilities where waiting and queuing areas, and service counters are AODA compliant	50%	Accessibility Audits (PDF)	TBD	-
							% of facilities where the public parking facilities are AODA compliant	100%	Accessibility Audits (PDF)	TBD	-
							% of facilities where the public entrance paths of travel are AODA compliant	100%	Accessibility Audits (PDF)	TBD	-
Quality	Providing clean and safe facilities in good condition for users	% of facilities in poor or very poor condition	5.85%	2018 Condition Assessment (Excel)	0%	-	# of events per year where combined sewer flow in the municipal wastewater	TBD	TBD	TBD	-
							% of facilities above target FCI	TBD	2018 Condition Assessment (Excel)	TBD	-
							% of facility assets by replacement value in poor or very poor condition	9.23%	2018 Condition Assessment (Excel)	33.6%	-
							Cleaning frequency	0	TBD	0	↑
							# of customer service requests relating to usage and availability	0	CRM Export (Excel)	TBD	↑
	Providing facilities at the right design standard	% of facilities at or above the target design standard	TBD	TBD	TBD	-	% of facilities that meet the target design standard	TBD	TBD	TBD	-
Environmental Stewardship	Providing facilities that are energy efficient	Annual energy consumption per square foot	TBD	TBD	TBD	-	Annual energy consumption per square foot	TBD	TBD	TBD	↑
	Providing facilities that are environmentally conscious	Annual water consumption per square foot	TBD	TBD	TBD	-	Annual water consumption per square foot	TBD	TBD	TBD	↑
							Volume of rainwater harvested	TBD	TBD	TBD	↑

Foundational Metrics
Advanced Metrics

Asset Levels of Service Framework

Service Category: Water
Service Statement: The Town of Fort Erie will strive to provide safe, clean drinking water of adequate pressure and flow with minimum service interruptions.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing water services in an efficient manner	Annual cost to provide water service (\$/household)	\$274/household	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$274/household	↑	Annual operating budget for water services	\$5,419,839	Operating Budget	\$5,419,839	↑
		Average water service asset renewal rate (# years)	96 years	TBD	96 years	-	Average annual capital expenditure for water services	\$1,793,000	Capital Budget - 2018 Budget Book (PDF)	\$1,793,000	↑
							10 Year average water linear asset renewal budget as a % of replacement value	1.0%	Capital Budget - 2018 Budget Book (PDF)	1.0%	-
Safe	Water system supports community fire protection	% of community with sufficient fire flow protection	97.60%	2016 MSP Water Model	100%	-	% of system not meeting fire flow targets	6%	2016 MSP Water Model	0%	↑
	Water system provides safe potable drinking water	% of community with acceptable risk of experiencing adverse water quality	100%	Water Sampling Results	TBD	-	% compliance with all applicable water quality regulations	100%	Water Sampling Results	100%	-
							# of confirmed adverse water quality tests	0	Water Sampling Results	0	↑
Quality	Providing high quality water to residents	# of complaints due to rusty/discoloured water	19	CRM Export (Excel)	TBD	↑	% of system serviced by sources that provide substandard water	TBD	TBD	TBD	-
							% length of system that is unlined CI/DI	21.93%	GIS (shp) Inventory	16.27%	-
		# of complaints due to low pressure	12	CRM Export (Excel)	TBD	↑	% of system with pressure < 40 psi	1%	2016 MSP Water Model	0%	-
Reliable	Providing water services with minimal interruptions	% of customers where service is interrupted above target frequency	TBD	TBD	TBD	-	# of connection-days where service is interrupted due to water main breaks	TBD	TBD	TBD	↑
							# of WM breaks across the system annually	39	Water Main Break History (Excel)	45	↑
							# of watermains above target break rate	3	Water Main Break History (Excel)	3	-
							# of watermains prone to frozen water services	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	Frozen Services Property List (Excel)	TBD	↑
							% length of watermains in poor or very poor condition	3.69%	GIS (shp) - More than 5 breaks	3.69%	-
							% of Bulk Water Station assets in poor or very poor condition	TBD	TBD	TBD	-
							# of unplanned failures resulting in service interruption/reduction	TBD	TBD	TBD	↑
Safe & Reliable	Providing safe and reliable drinking water	Boil water advisories and service interruptions	No boil water advisories, few service interruptions due to Town responsibilities	Water Dept	No boil water advisories, few service interruptions due to Town responsibilities	-	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0	TBD	0	-
							# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	TBD	TBD	TBD	-
Environmental Stewardship	Providing a water service that is environmentally conscious	Water consumption L/cap/day	TBD	TBD	TBD	-	Infrastructure Leakage Index (ILI)	3.84	AWWA - 2017 Water Audit (Excel)	3.84	-
Scope	Providing water services within the urban area	User groups or areas of Fort Erie that are connected to the municipal water system	Most properties within urban area are connected to the municipal water system.	2016 MSP	Most properties within urban area connected to the municipal water system.	-	% of properties connected to the municipal water system	88%	2016 MSP Water Model (Number of parcels in FE pressure zone)	88%	-
	Providing fire flow potable water services	User groups or areas of Fort Erie that have fire flow provided from the drinking water system	Most properties within urban area are connected to the municipal water system for fire flow.	2016 MSP	Most properties within urban area connected to the municipal water system for fire flow.	-	# of properties where fire flow is available	88%	2016 MSP Water Model (Number of parcels in FE pressure zone)	88%	-

Foundational Metrics
Advanced Metrics
O.Reg 588/17 Metrics

Asset Levels of Service Framework

Service Category: Wastewater
Service Statement: Efficiently providing reliable wastewater services that are conscious of impacts to private property and the environment.

Key Service Attribute	LOS Statement	Customer/Council Focused Performance Measures					Technical Focused Performance Measures				
		Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast	Performance Measure	Current Performance	Data Source	Proposed Performance	Forecast
Cost Efficient	Providing wastewater services in an efficient manner	Cost to provide service (\$/household)	\$249/household	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$308/household	↑	Annual operating budget and capital budget for wastewater	\$10,669,940	Operating Budget Capital Budget - 2018 Budget Book (PDF)	\$11,059,018	↑
							Annual operating and maintenance cost/km of sewer	\$46,721/km	Operating Budget	\$46,721/km	-
							Average annual capital expenditure for wastewater	\$1,627,500	Capital Budget - 2018 Budget Book (PDF)	\$2,016,578	↑
		Average wastewater asset renewal rate (# years)	106 years	TBD	85 years	-	10 Year average wastewater linear asset renewal budget as a % of replacement value	1.2%	Capital Budget - 2018 Budget Book (PDF)	1.40%	↑
Reliable	Providing wastewater services with minimal interruptions	# of customers that experience a service interruption	55	CRM Export (Excel) Work Order Data (CMMS when implemented)	55	↑	# of customers that experience basement flooding caused by system surcharge	3	CRM Export (Excel)	3	↑
							km of sewers in poor or very poor condition	87.46	GIS (shp) - Age-based	79.36	↓
							% length of sewers in poor or very poor condition	45.19%	GIS (shp) - Age-based	41.01%	↓
							% of the system surcharged within 1.8 m of the ground elevation during a 25-year wet weather event	TBD	TBD	TBD	-
							% of the system with adequate resiliency to accommodate the impacts of climate change	TBD	TBD	TBD	-
							# of sewers with operational issues likely to cause service interruptions	TBD	CMMS (once implemented)	TBD	↑
							% of preventative maintenance activities completed on schedule	TBD	CMMS (once implemented)	TBD	-
							# of locations with FOG issues or prone to blockages	TBD	CMMS (once implemented)	TBD	↑
							# of residences that have been reimbursed through the Extraneous Flow Reduction Program.	541	Ex Flow Reimbursement Summary (Excel)	TBD	↑
Safe	Protecting homes from sanitary wastewater backups or overflow	How combined sewers in the Fort Erie wastewater system are designed with overflow structures in place (to prevent backups into homes by allowing	No combined sewers allowed in new construction design. Overflow structures are the responsibility of the Region.	Engineering	No combined sewers allowed in new construction design. Overflow structures are the responsibility of the Region.	-	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	Not applicable	Not applicable	Not applicable	-
	Providing wastewater services that have minimal impacts on the environment	Frequency and volume of overflows in combined sewers in the Fort Erie wastewater system that occur in habitable areas or beaches	Few overflows in combined sewers in habitable areas or beaches.	Wastewater Dept	Few overflows in combined sewers in habitable areas or beaches	-					
	Protecting homes from sanitary wastewater backups or overflow	How stormwater can get into sanitary sewers in the Fort Erie wastewater system, causing sewage to overflow into streets or backup into homes	Some Inflow and Infiltration into sanitary system exists, through private connections, cross connections and system infrastructure deficiencies, such as cracks & leaks.	Engineering	Some Inflow and Infiltration into sanitary system exists, through private connections, cross connections and system infrastructure deficiencies, such as cracks & leaks.	-	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	TBD	TBD	TBD	-
	Protecting homes from sanitary wastewater backups or overflow	How sanitary sewers in the Fort Erie wastewater system are designed to be resilient to avoid storm events	Design and construction criteria for sanitary sewers in place, to ensure consistent and industry-accepted performance requirements, materials, and installation methods are used.	Engineering	Design and construction criteria for sanitary sewers in place, to ensure consistent and industry-accepted performance requirements, materials, and installation methods are used.	-	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0	TBD	0	-
	Not applicable - Sewage treatment is the responsibility of the Region	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater	Not applicable - Sewage treatment is the responsibility of the Region	Not applicable	Not applicable	-					
Environmentally Conscious	Providing wastewater services that have minimal impacts on the environment	% of wastewater flows that meet environmental objectives when discharged	TBD	TBD	TBD	-	# of relief pumping events	TBD	TBD	TBD	↑
							Total volume of untreated wastewater discharged into the natural environment via relief pumping events	TBD	TBD	TBD	↑
Scope	Providing sanitary wastewater services within the urban area	User groups or areas of Fort Erie that are connected to the municipal wastewater system	Most properties within urban area are connected to the municipal water system.	2019 MSP	Most properties within urban area connected to the municipal water system.	-	Percentage of properties connected to the municipal wastewater system	73%	2018 WWMP Model	73%	-

- Foundational Metrics
- Advanced Metrics
- O.Reg 588/17 Metrics

PERFORMANCE MEASURE	CURRENT PERFORMANCE	COMMENT
Annual cost to provide service (\$/household)	\$156	
Average bridge and structures renewal rate (# years)	37	
Annual operating budget for bridges and structures	TBD	Operating budget for bridges and structures currently unavailable due to operating budget format
Average annual capital expenditure for bridges and structures	\$1,019,245	
10 Year average bridges & structures asset renewal budget as a % of replacement value	2.7%	
Cost to provide service (\$/household)	\$467	
Average asset renewal rate (# years)	117	
Annual operating budget for roads	\$4,540,515	Current operating budget format provides budget for roads AND fleet as one category
Average annual capital expenditure for roads	\$3,054,000	
10 Year average roads and ROWs renewal budget as a % of replacement value	0.9%	
Annual cost to provide service (\$/household)	\$218	
Average stormwater asset renewal rate (# years)	109	Only have replacement values for stormsewers
Annual operating budget for stormwater	TBD	Operating budget for stormwater currently unavailable due to operating budget format
Average annual capital expenditure for stormwater	\$1,428,000	
10 Year average stormwater asset renewal budget as a % of replacement value	0.9%	Only have replacement values for stormsewers
Cost to provide service (\$/sqft)	\$3	
Average facilities renewal rate (# years)	119	
Annual operating budget for facilities management	TBD	Operating budget for facilities currently unavailable due to operating budget format
Average annual capital expenditure for facilities management	\$829,500	
10 Year forecast average facility asset renewal budget as a % of replacement value	0.8%	
% of buildings elements in poor or very poor condition that can be renewed within the next 10 years	TBD	
Annual cost to provide water service (\$/household)	\$274	
Average water service asset renewal rate (# years)	96	
Annual operating budget for water services	\$5,419,839	
Average annual capital expenditure for water services	\$1,793,000	
10 Year average water asset renewal budget as a % of replacement value	1.0%	
Cost to provide service (\$/household)	\$249	
Average wastewater asset renewal rate (# years)	106	Only have replacement values for sewers
Annual operating budget and capital budget for wastewater	\$10,669,940	
Annual operating and maintenance cost/km of sewer	\$46,721	193.54 km of sewer (from asset inventory)
Average annual capital expenditure for wastewater	\$1,627,500	
10 Year average wastewater asset renewal budget as a % of replacement value	1.2%	Only have replacement values for sewers
Cost to provide service (\$/household)	\$308	Uses Scenario 5 10-Year capital budget average
Average wastewater asset renewal rate (# years)	85	Uses Scenario 5 10-Year capital budget average
Annual operating budget and capital budget for wastewater	\$11,059,018	Uses Scenario 5 10-Year capital budget average
Annual operating and maintenance cost/km of sewer	\$46,721.30	Uses Scenario 5 10-Year capital budget average
Average annual capital expenditure for wastewater	\$2,016,578	Uses Scenario 5 10-Year capital budget average
10 Year average wastewater asset renewal budget as a % of replacement value	Report Card	

Capital Budget (performance forecast inputs)											
Service	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	10-Year Average
Bridges & Structures	\$ 916,200	\$ 1,498,250	\$ 550,500	\$1,498,250	\$ 886,250	\$ 584,500	\$ 703,500	\$ 912,000	\$1,236,000	\$1,407,000	\$ 1,019,245
Roads and ROWs	\$ 3,054,000	\$ 3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$3,054,000	\$ 3,054,000
Stormwater	\$ 1,428,000	\$ 1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$1,428,000	\$ 1,428,000
Facilities Management	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500	\$ 829,500
Water	\$ 1,793,000	\$ 1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$1,793,000	\$ 1,793,000
Wastewater	\$ 1,627,500	\$ 1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$1,627,500	\$ 1,627,500
Wastewater (Scenario 5)	\$ 1,708,875	\$ 1,790,250	\$1,871,625	\$1,953,000	\$2,034,375	\$2,115,750	\$2,197,125	\$2,278,500	\$2,359,875	\$1,856,400	\$ 2,016,578

Replacement Values (performance forecast asset registers)	
Category	Total Replacement Cost
Bridges & Culverts	\$ 37,350,500.00
Facilities	\$ 98,423,527.00
Roads	\$ 358,218,691.00
Sanitary Mains	\$ 136,114,289.00
Storm Mains	\$ 156,184,476.20
Water Mains	\$ 171,796,083.95

Operating Budget (From E1 2018 Budget Book, pg. 54-87)	
Service	2018
Bridges & Structures	?
Roads and ROWs (roads and fleet)	\$4,540,515
Stormwater	?
Facilities Management	?
Water	\$5,419,839
Wastewater	\$9,042,440

Facility Squarefootage (Sean's email)	
Facility	Sqft
Town Hall	38,000
Leisureplex	128,000
Crystal Ridge Arena	28,000
Crystal Ridge Community Centre	17,000
Gibson Centre	22,855
Gibson Storage Building	7,300
Stevensville Hall (includes library with	9,500
Central Fire Station	13,340
Station #3	12,000
Station #4	4,500
Station #5	7,550
Station #6	5,500
Ridgeway Historical Museum	4,746
Railroad GTR Station	1,028
Railroad CN-B1 Station	814
Centennial Library	16,000
Crystal Ridge Library	6,000
Total	322,133