Asset Management Plan

Town of Latchford

2021

Key Statistics

Replacement cost of asset portfolio
$26.1 million

Replacement cost of infrastructure per household
$127,000

Percentage of assets in fair or better condition
98%

Percentage of assets with assessed condition data
98%

Annual capital infrastructure deficit
$664,000

Recommended timeframe for eliminating annual infrastructure deficit
10-20 Years

Target reinvestment rate
2.5%

Actual reinvestment rate
0.4%

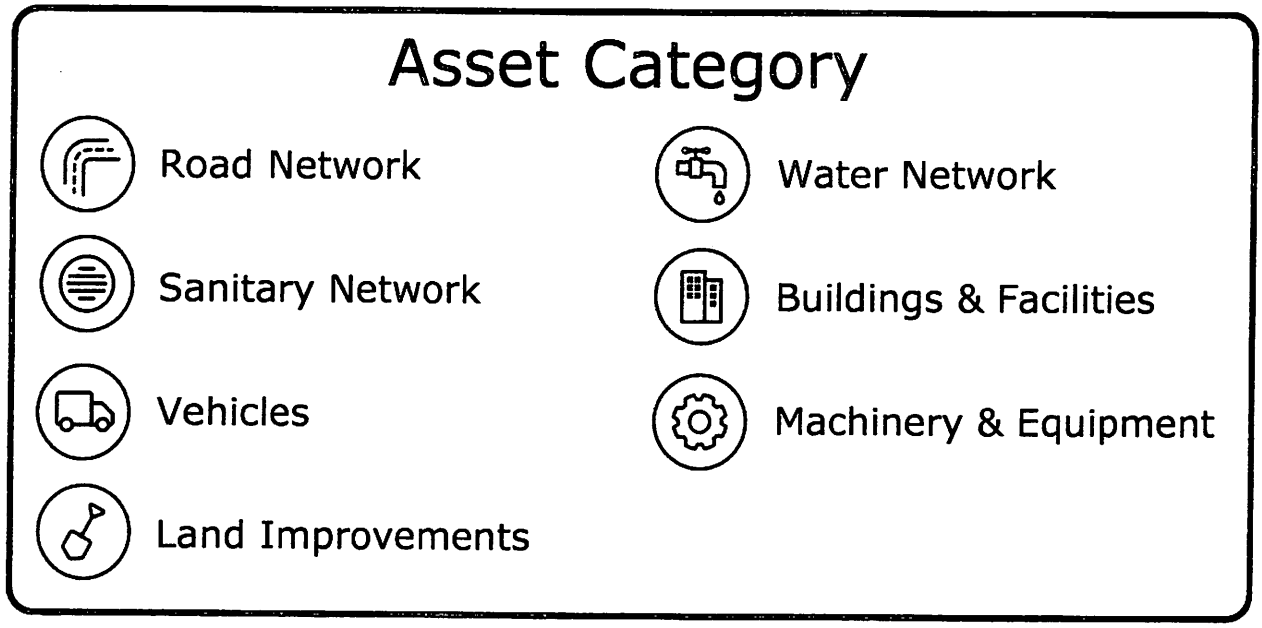
Executive Summary

Municipal infrastructure provides the foundation for the economic, social, and environmental health and growth of a community through the delivery of critical services. The goal of asset management is to deliver an adequate level of service in the most cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

Scope

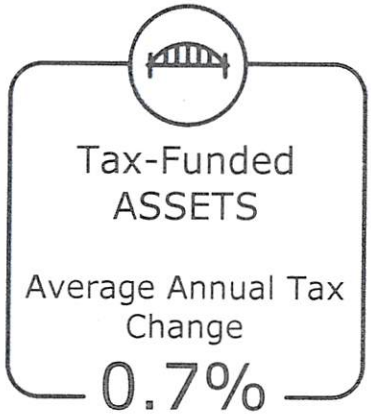
This AMP identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Town can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

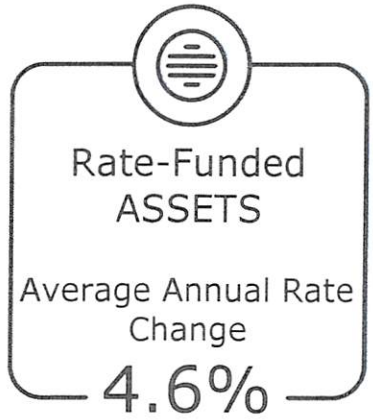
This AMP include the following asset categories:



Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax/rate change required to eliminate the Town's infrastructure deficit based on a 10-year plan for tax-funded assets and a 20-year plan for rate funded assets:





Recommendations to guide continuous refinement of the Town's asset management program. These include:

- Review data to update and maintain a complete and accurate dataset
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

1.1 Latchford Community Profile

Census Characteristic	Town of Latchford	Ontario
Population 2021	355	14,223,942
Population Change 2016-2021	13.4	5.8
Total Private Dwellings	206	5,929,250
Population Density	2.3/km^2	15.9/km^2
Land Area	152.26 km^2	892,411.76 km^2

The Town of Latchford is located in Northeastern Ontario in the Timiskaming District. The Town is surrounded by bodies of water including Bay Lake and the Montreal River.

The region was settled in 1903 as the Montreal River Station; the Town acted as a river crossing for the Northern Ontario Railway. The key economic sectors supporting the Town included silver mining followed by timber and pulp mills. Today the Town is made up of a notable population of senior people who have exited the work force.

Demand in the region is driven by moderate population growth, a budding summer cottage community, and an aging population above the provincial average. Population growth is largely due to urban sprawl and low housing prices. The Town generates a total revenue of $1.1 million from taxes and rates and has an annual capital budget of $96,000 as of 2021.

Town staff have identified the water network as a primary infrastructure priority. The water network is aging, particularly the water treatment plant, and maintenance and rehabilitation activities are mostly reactive.

A significant portion of infrastructure projects are heavily reliant on the availability of grants. Staff intend to support proactive lifecycle management within the own of Latchford by investing in critical infrastructure, improving long-term capital planning, and advancing their asset management program.

1.2.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the Town's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.

The Town adopted By-law No. 2020-007 "A Strategic Asset Management Policy" on March 19, 2020, in accordance with Ontario Regulation 588/17.

The objectives of the policy include:

- Forward looking
- Budgeting and planning
- Environmental Conscious
- Community focused

1.2.2 Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the Town plans to achieve asset management objectives through planned activities and decision-making criteria.

The Town's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded on in future revisions or as part of a separate strategic document.

1.2.3 Asset Management Plan

The asset management plan (AMP) presents the outcomes of the Town's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP typically includes the following content:

- State of Infrastructure
- Asset Management Strategies
- Levels of Service
- Financial Strategies

The AMP is a living document that should be updated regularly as additional asset and financial data becomes available. This will allow the Town to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

The Town's approach to lifecycle management is described within each asset category outlined in this AMP. Developing and implementing a proactive lifecycle strategy will help staff to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

1.3.2 Risk Management Strategies

Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery, assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal. Some are more important than others, and their failure or disrepair poses more risk to the community than that of others. For example, a road with a high volume of traffic that provides access to critical services poses a higher risk than a low volume rural road. These high-value assets should receive funding before others.

By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

This AMP includes a high-level evaluation of asset risk and criticality. Each asset has been assigned a probability of failure score and consequence of failure score based on available asset data. These risk scores can be used to prioritize maintenance, rehabilitation and replacement strategies for critical assets.

1.3.3 Levels of Service

A level of service (LOS) is a measure of what the Town is providing to the community and the nature and quality of that service. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Town as worth measuring and evaluating. The Town measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges and culverts, water, wastewater, stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in

1.4 Ontario Regulation 588/17

As part of the *Infrastructure for Jobs and Prosperity Act, 2015*, the Ontario government introduced Regulation 588/17 - Asset Management Planning for Municipal Infrastructure (O. Reg 588/17). Along with creating better performing organizations, more liveable and sustainable communities, the regulation is a key, mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

The diagram below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets (same components as 2022) and Asset Management Policy Update

2025

Asset Management Plan for All Assets with the following additional components:

1. Proposed levels of service for next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial

2 Scope and Methodology

Key Insights

- This asset management plan includes 7 asset categories and is divided between tax-funded and rate-funded categories
- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

purchased and/or constructed assets where the total cost is reflective of the actual costs that the Town incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.3 Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Town expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

By using an asset's in-service data and its EUL, the Town can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Town can more accurately forecast when it will require replacement. The SLR is calculated as follows:

$$Service\ Life\ Remaining\ (SLR) = In\ Service\ Date + Estimated\ Useful\ Life(EUL) - Current\ Year$$

2.4 Reinvestment Rate

As assets age and deteriorate they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

By comparing the actual vs. target reinvestment rate the Town can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

$$Target\ Reinvestment\ Rate = \frac{Annual\ Capital\ Requirement}{Total\ Replacement\ Cost}$$

$$Actual\ Reinvestment\ Rate = \frac{Annual\ Capital\ Funding}{Total\ Replacement\ Cost}$$

3 Portfolio Overview

Key Insights

- The total replacement cost of the Town's asset portfolio is $26.1 million
- The Town's target re-investment rate is 2.5%, and the actual re-investment rate is 0.4%, contributing to an expanding infrastructure deficit
- 98% of all assets are in fair or better condition
- 5% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $664,000 per year across all assets

3.2 Target vs. Actual Reinvestment Rate

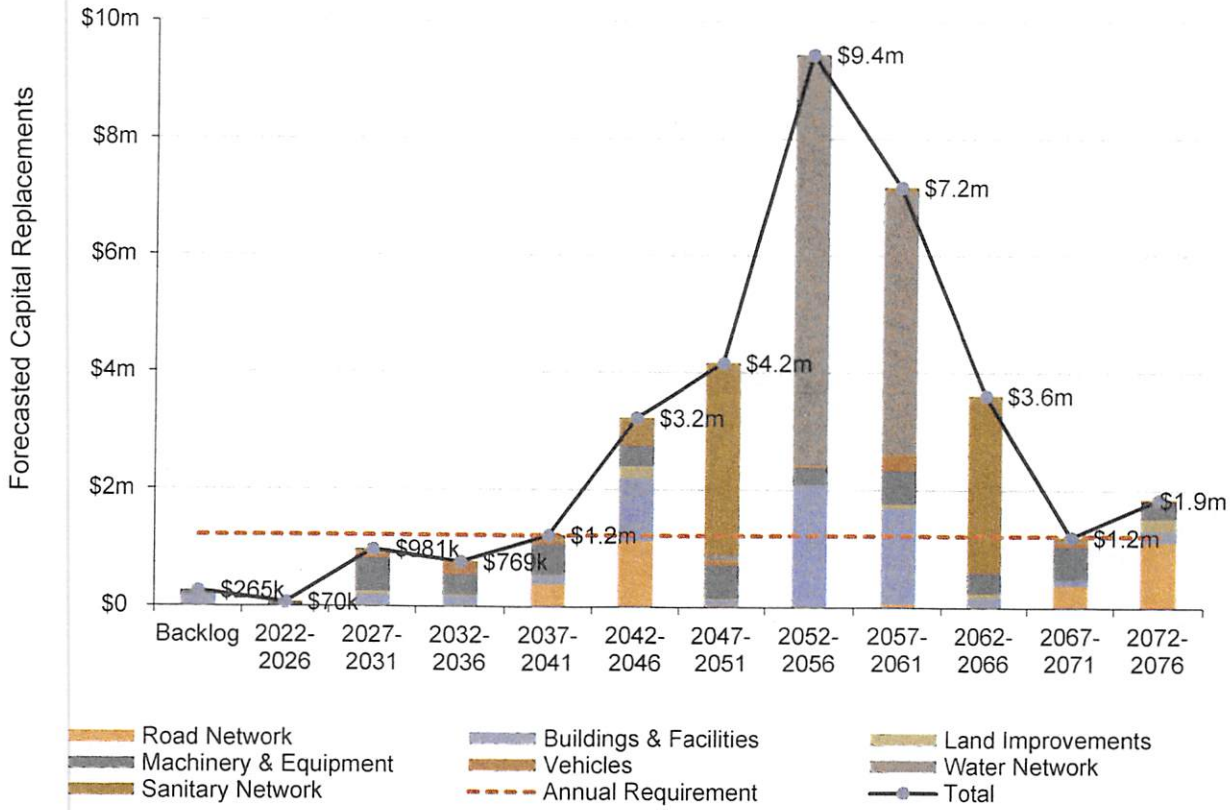
The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Town should be allocating approximately $664,000 annually, for a target reinvestment rate of 2.5%. Actual annual spending on infrastructure totals approximately $96,000, for an actual reinvestment rate of 0.4%.

3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 5% of the Town's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix B.

3.5 Forecasted Capital Requirements

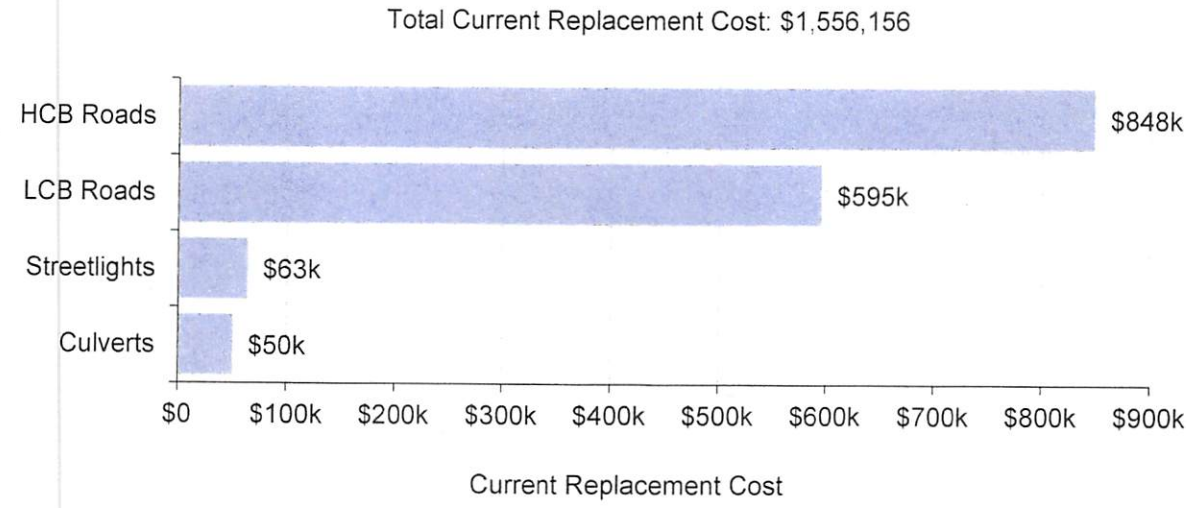
The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Town can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 55 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average annual capital requirement of $662,314.



4.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's road network inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Gravel	800 m	Not Planned for Replacement[1]	
Culverts	1	$50,000	$667
HCB Roads	2,280 m	$847,560	$28,252
LCB Roads	3,880 m	$595,110	$19,837
Streetlights	2	$63,486	$2,116
Total		**$1,556,156**	**$50,872**



Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

[1] Gravel roads undergo perpetual operating and maintenance activities. If maintained properly, they can theoretically have a limitless service life.

4.2.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the Town's current approach:

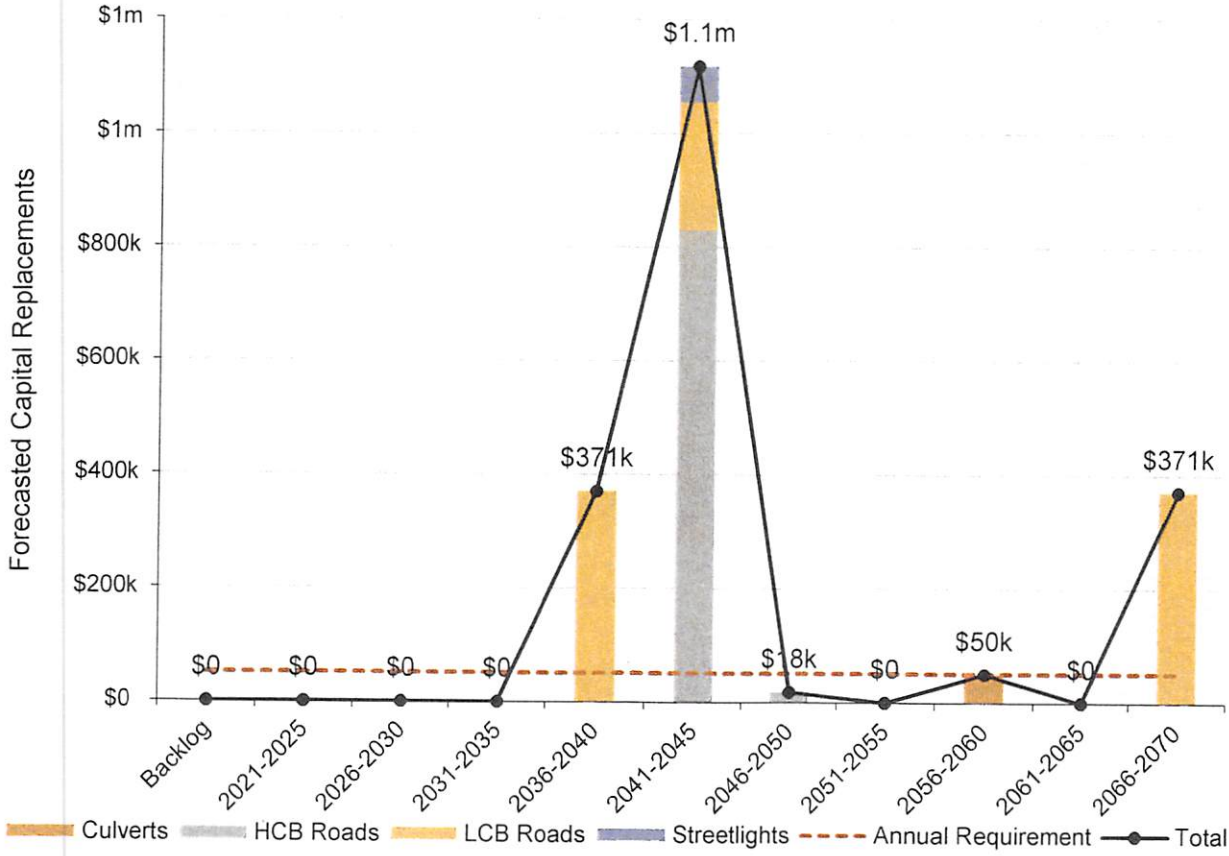
- The road network is visually assessed by municipal staff on a regular basis. Deficiencies are noted to inform capital planning.
- A Roads Needs Study was conducted in 2014 by a third-party consultant. Staff are considering adopting an assessment program that would include a complete assessment of roads on a 5 to 7-year cycle.

In this AMP the following rating criteria is used to determine the current condition of road segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

4.3.1 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 50 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins. The trend line represents the average annual capital requirement of $50,872.



The road network is in good condition and therefore it is not expected to require replacement until 2036. All paved roads in the Town were installed in 2008 and will require replacement between 2036 and 2045, as can be seen in the graph above.

The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix B.

4.5 Levels of Service

The following tables identify the Town's current level of service for the road network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Town has selected for this AMP.

4.5.1 Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by the road network.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix C
Quality	Description or images that illustrate the different levels of road class pavement condition	Very Poor: Widespread signs of deterioration. Requires remedial work to bring road up to standard. Service is affected Poor: Large portions of road exhibiting deterioration with rutting, potholes, distortions, longitude and lateral cracking. Road is mostly below standard. Fair: Some sections of road starting to deteriorate. Requires some remedial work and surface upgrade in near future. Good: Road is in overall good condition. Few sections are starting to show signs of minimal deterioration. Very Good: Road is well maintained and in excellent condition. Surface was newly or recently upgraded. No signs of deterioration or remedial work required.

4.6 Recommendations

Asset Inventory

- Review road and culvert inventory to determine whether all municipal assets within these asset segments have been accounted for.

Condition Assessment Strategies

- The last comprehensive assessment of the road network was completed in 2014. Consider completing an updated assessment of all roads on a 5 to 7-year cycle.

Lifecycle Management Strategies

- Consider adopting lifecycle management strategies for HCB and LCB roads that include proactive maintenance and rehabilitation to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Town's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

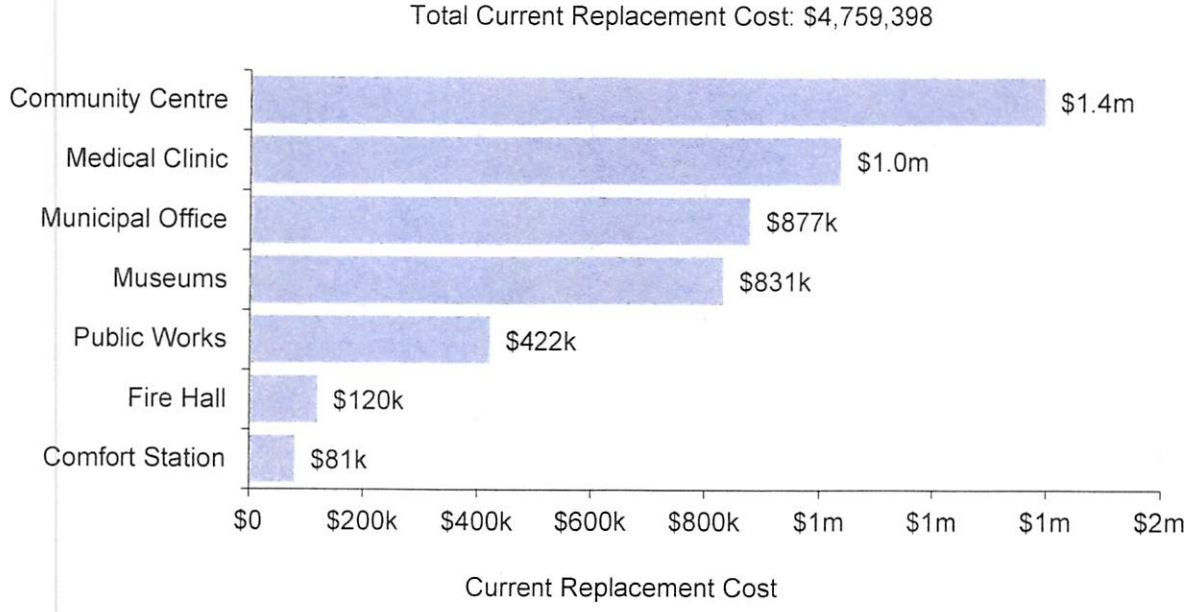
Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Town believes to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

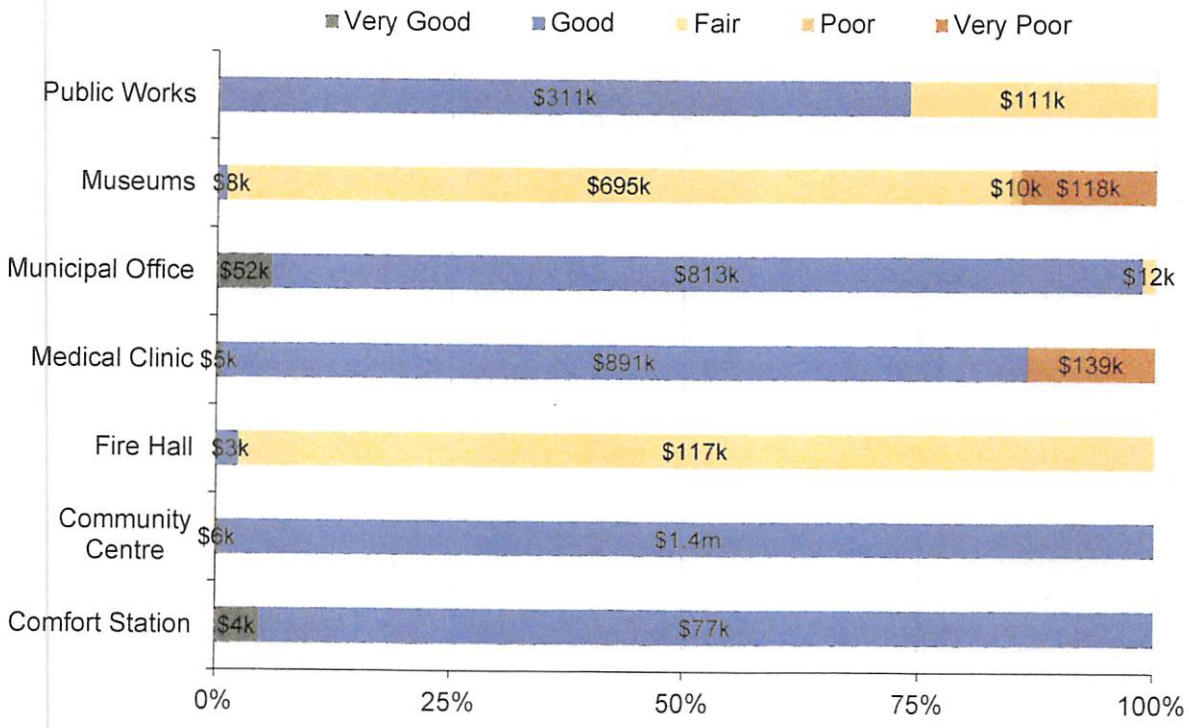
5.1 Asset Inventory & Costs

The table below includes the quantity, total replacement cost and annual capital requirements of each asset segment in the Town's buildings and facilities inventory.

Asset Segment	Quantity (Component)	Replacement Cost	Annual Capital Requirement
Comfort Station	1(3)	$80,942	$1,619
Community Centre	1(10)	$1,394,197	$30,614
Fire Hall	1(5)	$119,520	$2,616
Medical Clinic	1(4)	$1,035,163	$36,419
Municipal Office	1(10)	$876,888	$20,411
Museums	1(9)	$831,167	$16,623
Public Works	3	$421,521	$8,430
Total		**$4,759,398**	**$116,733**



Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.



Value and Percentage of Assets by Replacement Cost

To ensure that the Town's buildings and facilities continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the buildings and facilities.

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

5.4 Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk are critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

6 Vehicles

Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support fire department services and public works services.

The state of the infrastructure for the vehicles is summarized in the following table.

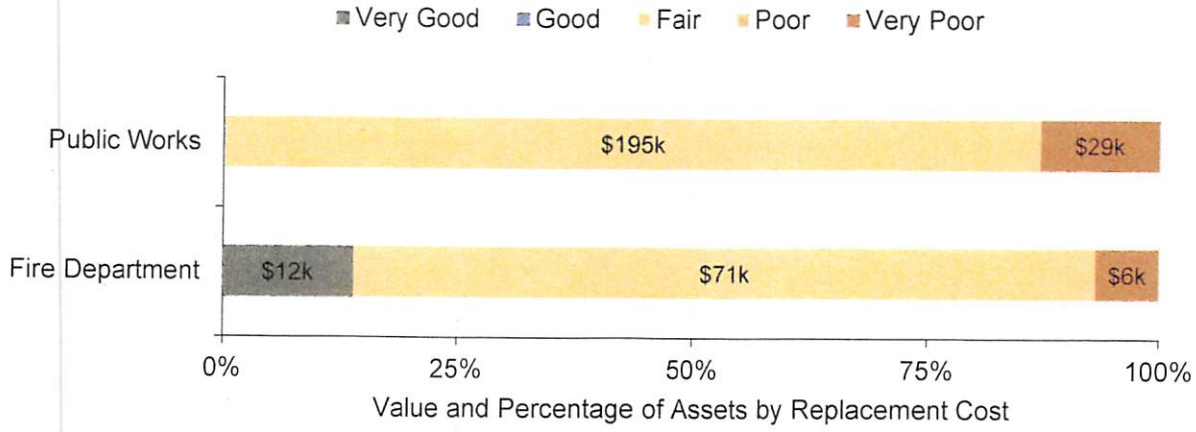
Replacement Cost	Condition	Financial Capacity	
$312,745	Fair (43%)	Annual Requirement:	$20,000
		Funding Available:	$0
		Annual Deficit:	$20,000

6.2 Asset Condition & Age

The table below identifies the current average condition and source of available condition data for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Environmental Services	10	5.0	51%
Fire Department	23	13.5	40%
Average			**43%**

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Town's vehicles continue to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the vehicles.

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

6.4 Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk are critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

7 Machinery & Equipment

In order to maintain the high quality of public infrastructure and support the delivery of core services, Town staff own and employ various types of machinery and equipment. This includes:

- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Equipment to complete lifecycle activities for roads, water, and sanitary
- Computers and technical equipment in municipal offices

Keeping machinery and equipment in an adequate state of repair is important to maintain a high level of service.

The state of the infrastructure for the machinery and equipment is summarized in the following table.

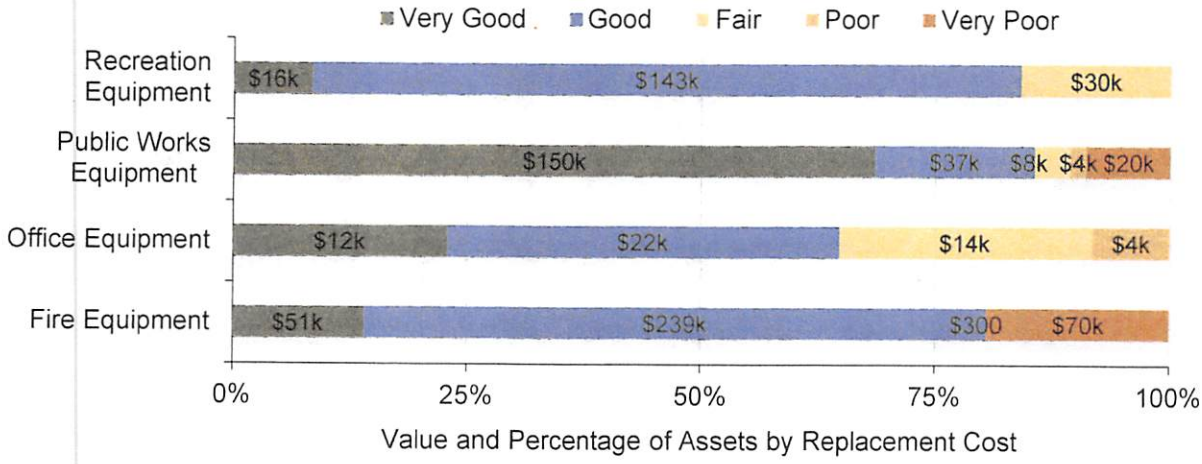
Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	$88,000
$820,982	Good (69%)	Funding Available:	$1,000
		Annual Deficit:	$87,000

7.2 Asset Condition & Age

The table below identifies the current average condition and source of available condition data for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Fire Equipment	10	14.2	62% (Good)
Office Equipment	6	15.3	65% (Good)
Public Works Equipment	10	6.5	81% (Very Good)
Recreation Equipment	10	16.1	71% (Good)
Average			**69% (Good)**

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



Value and Percentage of Assets by Replacement Cost

To ensure that the Town's machinery and equipment continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the machinery and equipment.

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

7.4 Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk are critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

8 Land Improvements

The Town of Latchford owns a small number of assets that are considered land improvements. This category includes parking lots, walkways, and other assets in municipal parks.

The state of the infrastructure for the land improvements is summarized in the following table.

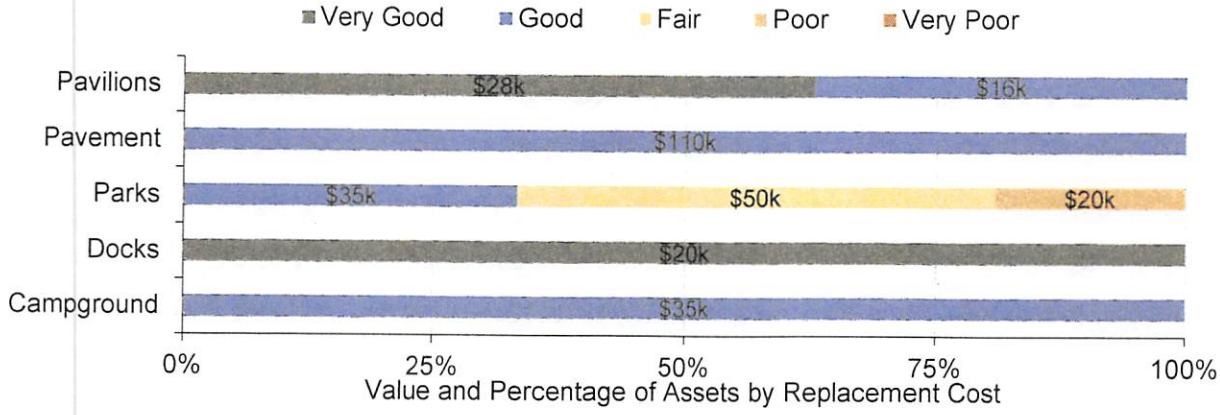
Replacement Cost	Condition	Financial Capacity	
		Annual Requirement:	$14,000
$312,745	Good (67%)	Funding Available:	$0
		Annual Deficit:	$14,000

8.2 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Campground	30	14.0	74% (Good)
Docks	15	5.0	91% (Very Good)
Parks	17	26.0	51% (Fair)
Pavement	30	19.0	71% (Good)
Pavilions	50	27.2	77% (Good)
Average			**67% (Good)**

The graph below visually illustrates the average condition for each asset segment on a very good to very poor.



To ensure that the Town's land improvements continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the land improvements.

Each asset's estimated useful life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

8.4 Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk are critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue to gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

9 Water Network

The water services provided by the Town are overseen by municipal staff. The department is responsible for the following the water mains, fire hydrants, and water treatment plant.

The state of the infrastructure for the water network is summarized in the following table:

Replacement Cost	Condition	Financial Capacity (Water & Sanitary Network Combined)	
$11.6 million	Good (68%)	Annual Requirement:	$374,000
		Funding Available:	$39,000
		Annual Deficit:	$335,000

The following core values and level of service statements are a key driving force behind the Town's asset management planning:

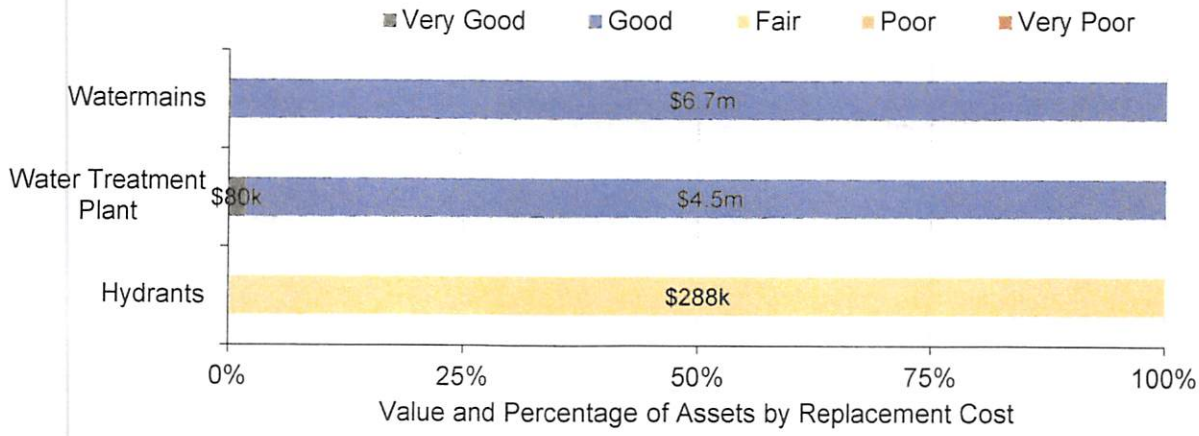
Service Attribute	Level of Service Statement
Scope	The Municipal water is conveniently accessible to 67% of the community in sufficient capacity (does not exceed maximum use). The Municipal fire flow system is accessible to 67% of the community in sufficient capacity.
Quality/Reliability	The water network is in good condition with minimal unplanned service interruptions due to main breaks and boil water advisories.

9.2 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Hydrants	60	42.0	52% (Fair)
Water Treatment Plant	50	46.2	75% (Good)
Watermains	50	44.0	64% (Good)
Average			**68% (Good)**

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Town's water network continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the water network.

Each asset's Estimated Useful Life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

9.3 Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

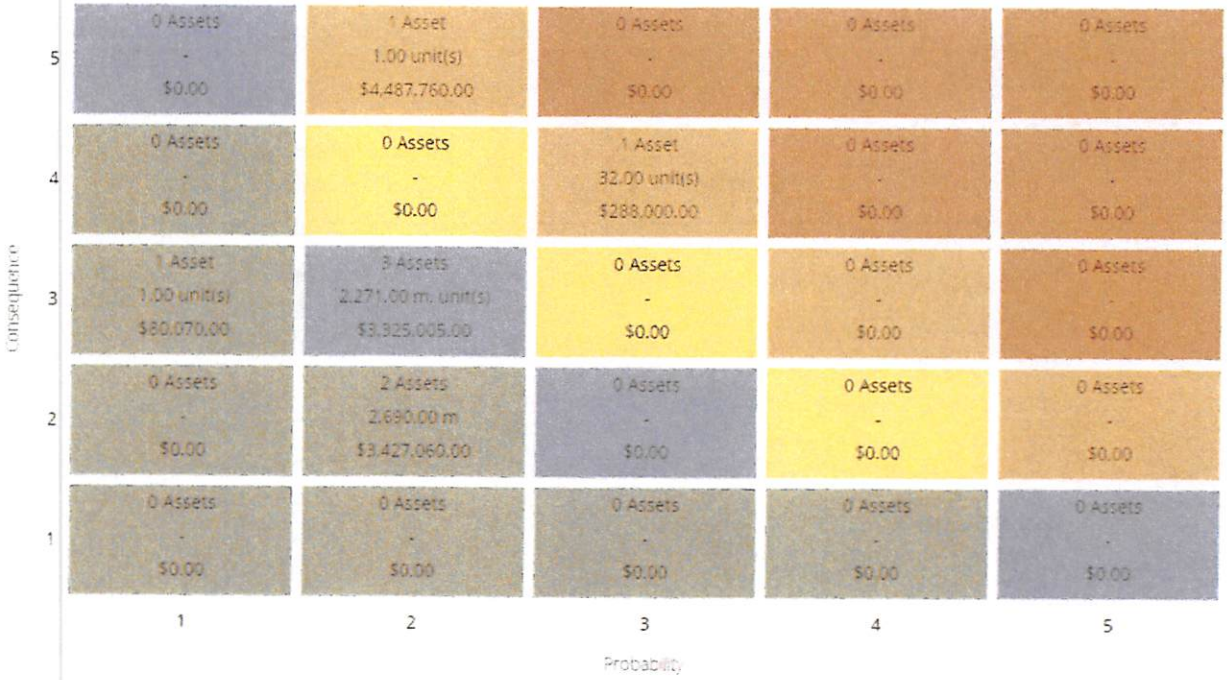
The following table outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	Main flushing is completed twice per year using in-house resources. The valve exercising program include an annually in the Spring. Leak detection and CCTV inspections are reactive.
Rehabilitation	Trenchless re-lining of water mains presents significant challenges and is not always a viable option.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life. Replacement activities are identified based on an analysis of main age and material, the main break rate, as well as any issues identified during regular maintenance activities.

9.4 Risk & Criticality

9.4.1 Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.



This is a high-level model developed for the purposes of this AMP and Town staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure. The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the water network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Pipe Diameter

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

9.5.2 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the water network.

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of properties connected to the municipal water system	67%
	% of properties where fire flow is available	67%
Reliability	# 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
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Capital re-investment rate for the water and sanitary network	0.2%

10 Sanitary Network

The Sanitary Network provided by the Town are overseen by municipal staff. The department is responsible for sanitary mains, lift stations, and sanitary treatment plant.

The state of the infrastructure for the sanitary network is summarized in the following table.

Replacement Cost	Condition	Financial Capacity (Water & Sanitary Network Combined)	
$6.7 million	Good (63%)	Annual Requirement:	$374,000
		Funding Available:	$39,000
		Annual Deficit:	$335,000

The following core values and level of service statements are a key driving force behind the Town's asset management planning.

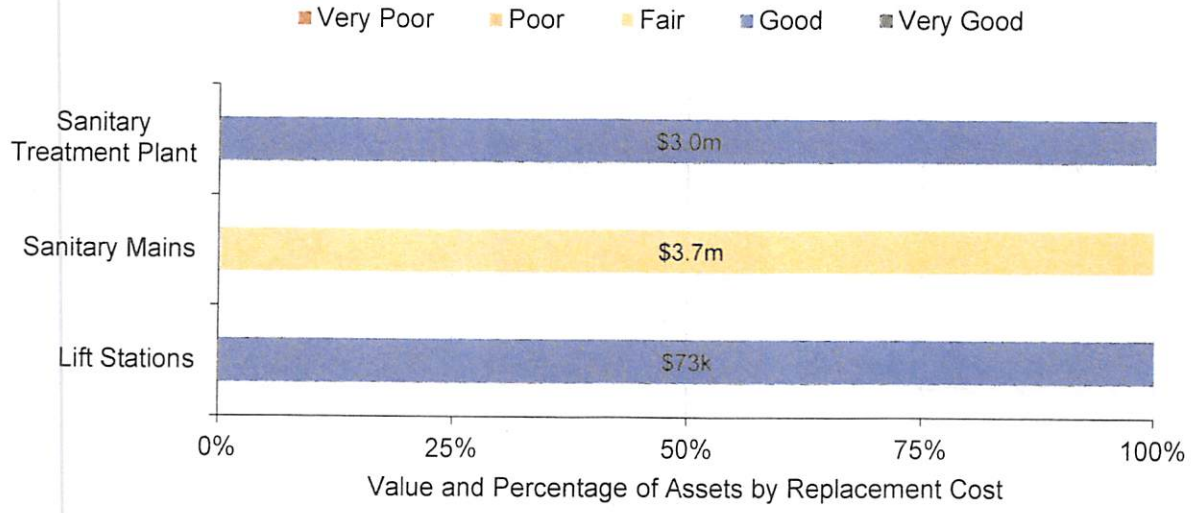
Service Attribute	Level of Service Statement
Scope	The Municipal sanitary system is accessible to 63% of the community in sufficient capacity (does not exceed maximum capacity).
Quality/Reliability	The sewer network is in good condition with minimal unplanned service interruptions due to backups and effluent violations.

10.2 Asset Condition & Age

The table below identifies the current average condition, the average age, and the estimated useful life for each asset segment. The average condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age	Average Condition (%)
Lift Stations	10	5.0	77% (Good)
Sanitary Mains	50	46.0	49% (fair)
Sanitary Treatment Plant	50	0.0	80% (Good)
Average			**63% (Good)**

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.



To ensure that the Town's sanitary network continues to provide an acceptable level of service, the Town should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the sanitary network.

Each asset's Estimated Useful Life should also be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

10.3 Lifecycle Management Strategy

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance	CCTV inspections are reactive.
Rehabilitation	Trenchless re-lining of sanitary mains presents significant challenges and is not always a viable option.
Replacement	In the absence of mid-lifecycle rehabilitative events, most mains are simply maintained with the goal of full replacement once it reaches its end-of-life. Replacement activities are identified based on an analysis of the main break rate as well as any issues identified during regular maintenance activities.

10.4 Risk & Criticality

10.4.1 Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2021 inventory data.

This is a high-level model developed for the purposes of this AMP and Town staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

The asset-specific attributes that municipal staff utilize to define and prioritize the criticality of the sanitary network are documented below:

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Pipe Diameter

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Service Attribute	Qualitative Description	Current LOS (2021)
	overflow into streets or backup into homes	sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow backup into homes. The disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Town follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows and backups.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

10.6 Recommendations

Asset Inventory

- There are a number of pooled sanitary main assets that require further segmentation and length measurements to allow for asset-specific lifecycle planning and costing. The sanitary treatment plant includes several pooled assets as well. The Plant consist of several separate capital components that have unique estimated useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

Condition Assessment Strategies

- Identify condition assessment strategies for high value and high-risk sanitary network assets.

Risk Management Strategies

- Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.
- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Lifecycle Management Strategies

- A trenchless re-lining strategy is expected to extend the service life of sanitary mains at a lower total cost of ownership and should be implemented to extend the life of infrastructure at the lowest total cost of ownership.
- Evaluate the efficacy of the Town's lifecycle management strategies at regular intervals to determine the impact cost, condition and risk.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics that the Town has established in this AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

11.1 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Town to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

11.1.1 Latchford Official Plan (December 1981)

The Town of Latchford has an Official Plan from 1981. The Official Plan serves as a development guide for the Latchford planning area. The Plan makes several assumptions for growth based on historical population figures. The Latchford planning area has experienced notable changes since the Plan was developed, therefore, the assumptions in the plan are no longer reliable.

To analyze growth, the following table was developed using census data from 2001 to 2021.

Historical Figures	2001	2006	2011	2016	2021
Population	363	390	387	313	355
Population Percentage Change	5.2%	7.4%	-0.8%	-19.1%	13.4%
Private Dwellings	183	191	202	227	206

Population levels in the Town have increased and declined at varying rates in the last two decades. The population has ranged between 313 and 390 with no discernible trend of growth.

11.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the Town's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

As the Town's population is expected to remain the same with possible moderate increases and declines in the coming years, demand will evolve, and it is likely that funding will need to be reprioritized. As growth-related assets are constructed, retired, or acquired, they should be integrated into the AMP. Furthermore, the Town will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

12.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the Town of Latchford to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

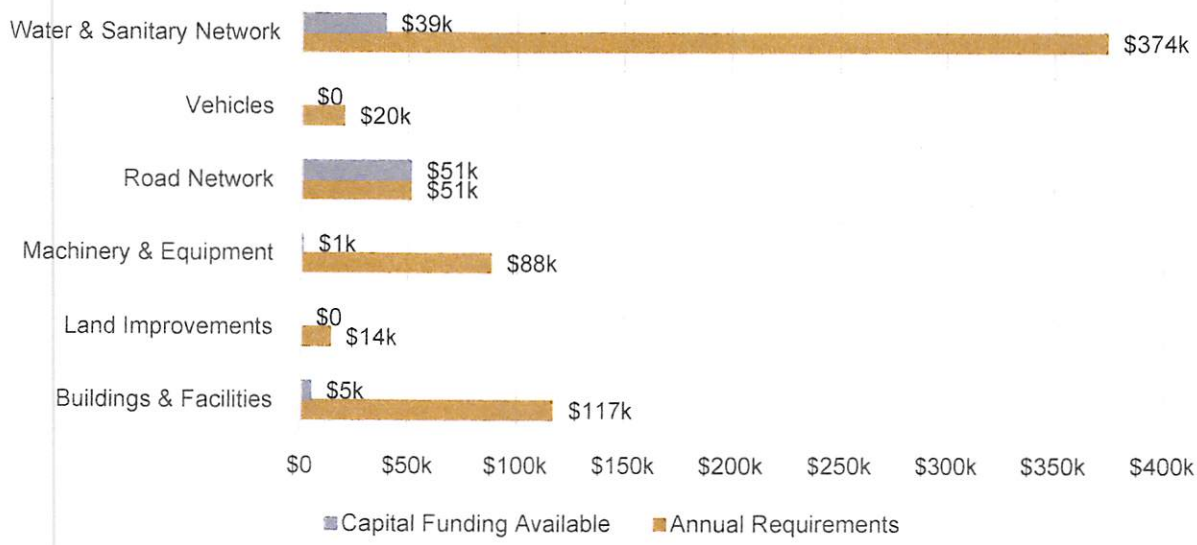
Note: Periodic grants are normally not included due to Provincial requirements for firm commitments. However, if moving a specific project forward is wholly dependent on receiving a one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a Town's approach to the following:

1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $96,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $664,000, there is currently a funding gap of $568,000 annually.



For the purposes of the financial analysis, the funding strategies for the water and sanitary network are combined. The water and sanitary network are funded primarily through a one rate levy for both water and sanitary services since the Town only collects one rate.

12.2 Funding Objective

We have developed a scenario that would enable Latchford to achieve full funding within 20 years for the following assets:

1. **Tax Funded Assets:** Road Network, Buildings & Facilities, Machinery & Equipment, Land Improvements Vehicles
2. **Rate-Funded Assets:** Water Network, Sanitary Network

Note: For the purposes of this AMP, we have excluded gravel roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

The following changes in costs and/or revenues over the next number of years should also be considered in the financial strategy:

a) Latchford's formula based OCIF grant is scheduled to grow from $50,000 in 2021 to $100,000 in 2022.
b) Latchford's debt payments for these asset categories will be decreasing by $200,000 over the next 5 years and by $24,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $24,000 and $0 over the next 15 and 20 years respectively.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above. The table below outlines this concept and presents several options:

	Without Capturing Changes				**With Capturing Changes**			
	5 Years	**10 Years**	**15 Years**	**20 Years**	**5 Years**	**10 Years**	**15 Years**	**20 Years**
Infrastructure Deficit	233,000	233,000	233,000	233,000	233,000	233,000	233,000	233,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-142,000	-176,000	-176,000	-200,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	0	0	0	0
Resulting Infrastructure Deficit	233,000	233,000	233,000	233,000	91,000	57,000	57,000	33,000
Tax Increase Required	25.9%	25.9%	25.9%	25.9%	10.1%	6.3%	6.3%	3.7%
Annually	**4.8%**	**2.4%**	**1.6%**	**1.2%**	**2.0%**	**0.7%**	**0.5%**	**0.2%**

12.4 Financial Profile: Rate Funded Assets

12.4.1 Current Funding Position

The following tables show, by asset category, Latchford's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by rates.

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Operations	CCBF	Total Available	
Water and Sanitary Network	374,000	235,000	-230,000	34,000	39,000	335,000
Total	**374,000**	**235,000**	**-230,000**	**34,000**	**39,000**	**335,000**

The average annual investment requirement for the above categories is $373,000. Annual revenue currently allocated to these assets for capital purposes is $39,000 leaving an annual deficit of $334,000. Put differently, these infrastructure categories are currently funded at 10.5% of their long-term requirements.

12.4.2 Full Funding Requirements

In 2021, Latchford had combined annual Water Network and Sanitary Sewer Network $235,000. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Tax Change Required for Full Funding
Water and Sanitary Network	142%

In the following tables, we have expanded the above scenario to present multiple options. Due to the significant increases required, we have provided phase-in options of up to 20 years:

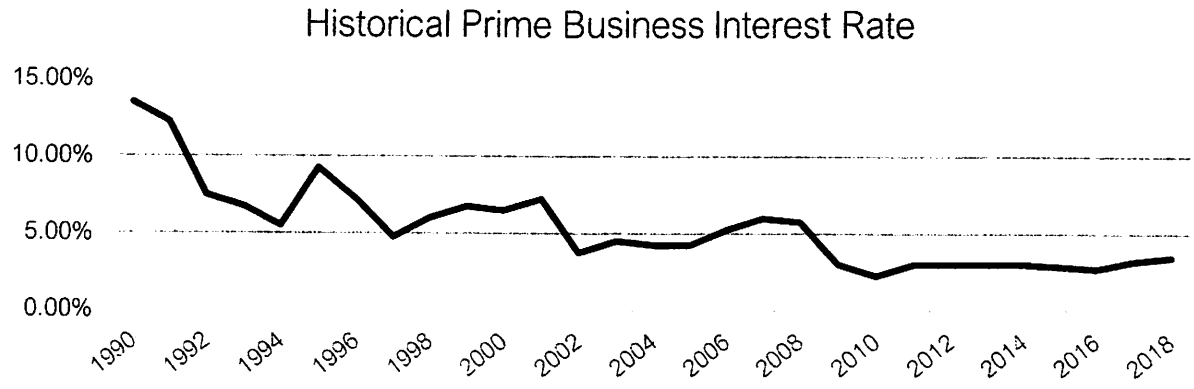
	Water and Sanitary Network			
	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	334,000	334,000	334,000	334,000
Rate Increase Required	142.1%	142.1%	142.1%	142.1%
Annually:	**19.4%**	**9.3%**	**6.1%**	**4.6%**

12.5 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[3] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

Interest Rate	Number of Years Financed					
	5	**10**	**15**	**20**	**25**	**30**
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



[3] Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

12.6 Use of Reserves

12.6.1 Available Reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning include:

a) the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors
b) financing one-time or short-term investments
c) accumulating the funding for significant future infrastructure investments
d) managing the use of debt
e) normalizing infrastructure funding requirement

By asset category, the table below outlines the details of the reserves currently available to Latchford.

Asset Category	Balance on December 31, 2021
Road Network	93,000
Buildings & Facilities	4,000
Machinery & Equipment	44,000
Land Improvements	36,000
Vehicles	6,000
Total Tax Funded	**183,000**
Water Network	69,000
Sanitary Network	41,000
Total Rate Funded	**110,000**

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Town should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Latchford's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and

13 Appendices

Key Insights

- Appendix A includes a one-page report card with an overview of key data from each asset category
- Appendix B identifies projected 10-year capital requirements for each asset category
- Appendix C includes several maps that have been used to visualize the current level of service
- Appendix D provides additional guidance on the development of a condition assessment program

Appendix B: 10-Year Capital Requirements

The following tables identify the capital cost requirements for each of the next 10 years in order to meet projected capital requirements and maintain the current level of service.

Road Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
HCB Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
LCB Roads	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings & Facilities

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Comfort Station	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Centre	$0	$0	$0	$0	$0	$0	$0	$0	$0	$12k	$5k
Fire Hall	$0	$0	$0	$0	$0	$0	$0	$0	$3k	$0	$0
Medical Clinic	$139k	$0	$0	$0	$0	$0	$0	$0	$0	$57k	$0
Municipal Office	$0	$0	$0	$0	$0	$0	$12k	$0	$4k	$0	$0
Museums	$30k	$0	$0	$0	$0	$0	$88k	$0	$0	$0	$0
Public Works	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$169k**	**$0**	**$0**	**$0**	**$0**	**$0**	**$101k**	**$0**	**$7k**	**$70k**	**$5k**

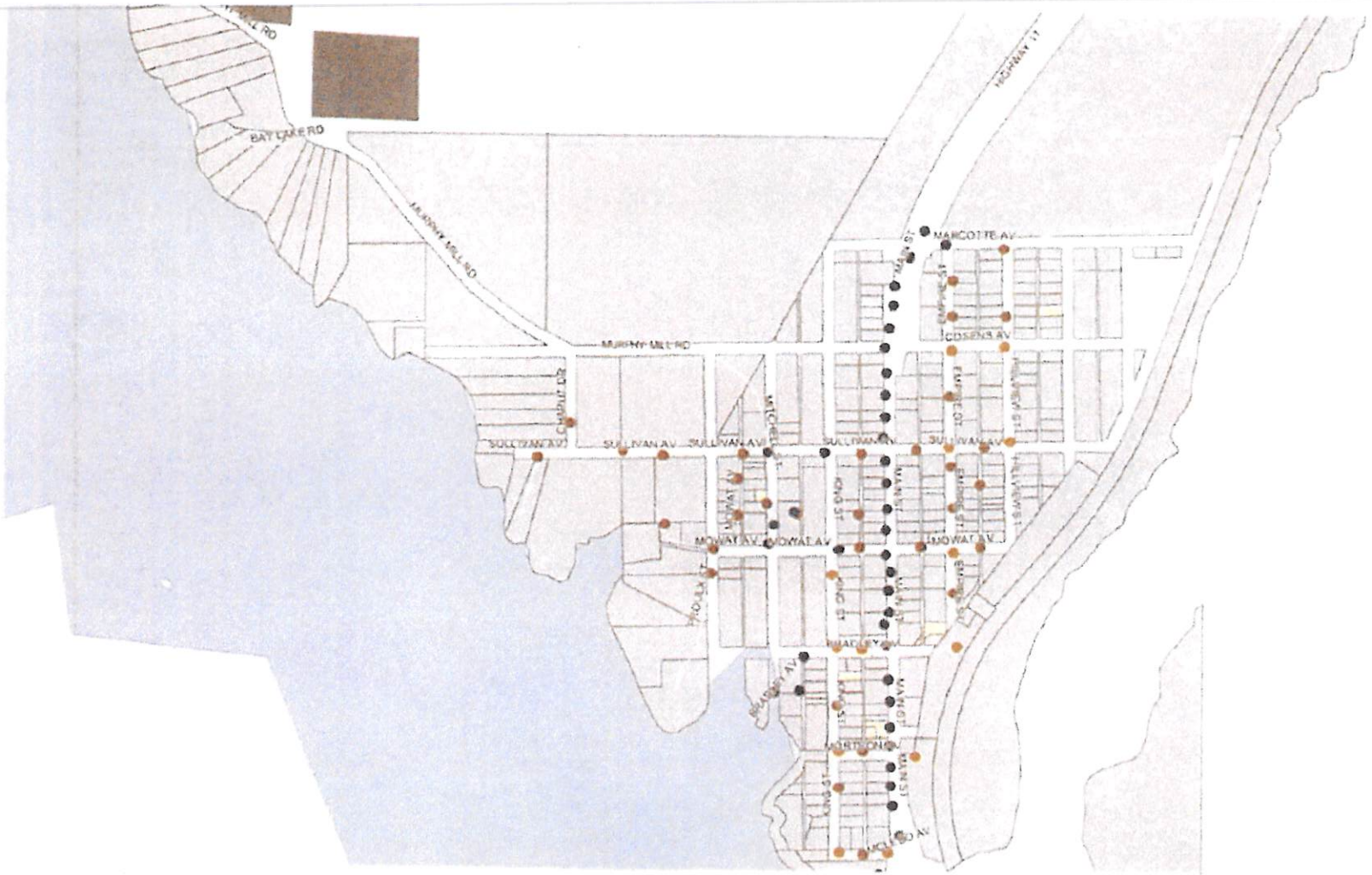
Water Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Hydrants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Treatment Plant	$0	$0	$0	$0	$0	$0	$0	$0	$0	$13k	$0
Watermains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$13k**	**$0**

Sanitary Network

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sanitary Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$73k	$0
Sanitary Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$73k**	**$0**

Streetlights Maps



Appendix D: Condition Assessment Guidelines

The foundation of good asset management practice is accurate and reliable data on the current condition of infrastructure. Assessing the condition of an asset at a single point in time allows staff to have a better understanding of the probability of asset failure due to deteriorating condition.

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the Town's condition assessment strategy should outline several key considerations, including:

- The role of asset condition data in decision-making
- Guidelines for the collection of asset condition data
- A schedule for how regularly asset condition data should be collected

Role of Asset Condition Data

The goal of collecting asset condition data is to ensure that data is available to inform maintenance and renewal programs required to meet the desired level of service. Accurate and reliable condition data allows municipal staff to determine the remaining service life of assets, and identify the most cost-effective approach to deterioration, whether it involves extending the life of the asset through remedial efforts or determining that replacement is required to avoid asset failure.

In addition to the optimization of lifecycle management strategies, asset condition data also impacts the Town's risk management and financial strategies. Assessed condition is a key variable in the determination of an asset's probability of failure. With a strong understanding of the probability of failure across the entire asset portfolio, the Town can develop strategies to mitigate both the probability and consequences of asset failure and service disruption. Furthermore, with condition-based determinations of future capital expenditures, the Town can develop long-term financial strategies with higher accuracy and reliability.

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of