



Village of Montrose

Asset Management

Capital Program

2022 to 2026



Canada



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Executive Summary

This document provides the basis for capital programming strategies from an asset management perspective.

Challenges often arise in municipal infrastructure management when a short-term view is used to make decisions. Across Canada, there was an infrastructure boom in the mid-1900s and municipalities were subsequently required to take responsibility for operating and maintaining infrastructure. Following this infrastructure boom, however, the amount of government infrastructure investment diminished and municipal infrastructure gaps grew larger. Many municipalities are now seeing their infrastructure reaching end-of-life and are struggling to keep up with required infrastructure investment.

There has recently been a shift in government policymaking to avoid a recurrence of diminished infrastructure investment for Canada's core services and take on a more long-term management strategy. As a municipality, it is our responsibility to communicate and justify Montrose's long-term needs to ensure sustainable service delivery.

A detailed breakdown of service areas, location of infrastructure, and risk values can be found on mycivitas.ca, the village's asset management website.

The capital program focuses on short-term planning and long-term capital targets. Short-term planning includes selecting capital projects that target the community's highest-risk assets first. Long-term planning considers future infrastructure demand and expected revenue to identify potential infrastructure deficits on a medium-term (20 years) and generational scale (80 or more years).

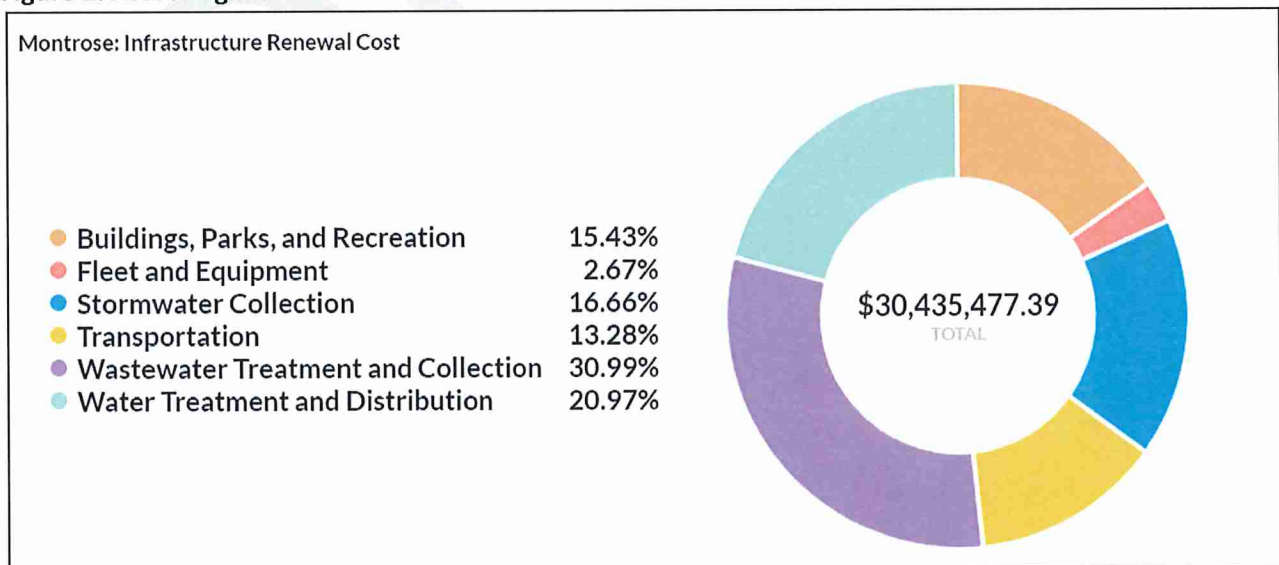
Montrose is committed to developing capital programs that identify capital priorities in a transparent and accountable process. Capital decisions will be based on risk management.

1. Asset Register

The Village of Montrose has a GIS-based asset register and can be viewed at mycivitas.ca and for summary tables and graphs, click [here](#). The asset register is maintained using QGIS, an open-source application. The village manages infrastructure in the following service areas:

- Wastewater Treatment and Collection
 - The original wastewater network was installed in the late 1960s and 1970s with expansion in the early the 1980s.
 - The total estimated replacement cost of the wastewater systems is approximately \$9.4M with around 10 km of pipe, 125 manholes, 2 lift stations and a wastewater treatment plant.
- Water Treatment and Distribution
 - The original water system was installed in the 1950s with expansions to the network in the 1970s and 2020s.
 - The total estimated replacement cost of the water system is estimated to be almost \$6.4M with approximately 12.3 km of pipe, 41 hydrants, and a liquid chlorine treatment plant.
- Stormwater system
 - The original stormwater system was installed in the 1950s with additions to the network in the 1980s
 - The village’s stormwater includes approximately 6 km pipe and 121 catch basins with an estimated renewal cost of approximately \$5M.
- Transportation Network
 - Montrose owns a roads of approximately 13.8 km. The replacement cost of both the walkways and trails is approximately \$4M.
- Buildings, Parks and Recreation
 - There are a large number of high-value public buildings that are maintained across Montrose with an estimated replacement value of approximately \$4.7M .

Figure 1: Asset Register Value



2. Policy and Governance

This capital program has been developed in accordance with applicable community plans and asset management principles with reference to the following guidance documents:

- Official Community Plan 2021

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3. Revenue Structures

Montrose generates revenue for capital maintenance, renewal and upgrades through general revenue from rate payments and taxes, reserves, borrowing, and grant funding.

I. Rate Payments

Montrose has a flat rate structure for water and sewer services as approved by the village. By tracking long-term infrastructure requirements, Montrose safeguards against sudden, unexpected rate increases. Rates are set based on yearly budgets and projections of sustainable infrastructure investment. Existing charges for water and sewer services for 2022 is set out below (see [Bylaw #766](#))

Water User Rates 2022 - SCHEDULE "A"		
DESCRIPTION	Full Rate	Discount Rate (10%)
a) Residential use, per dwelling unit or service	385.32	346.79
b) Commercial or non-residential use, per unit or service	385.32	346.79
c) Commercial Car Wash, per service	573.72	516.35
d) Pools (permanently installed)	96.04	86.44
e) Pools (temporarily installed with a surface area greater than 15 m ² (160 ft ²) or depth greater than 600 mm (2 ft))	63.21	56.89
f) Outside use - per occurrence (prior Council approval required)	127.63	N/A

Sewer User Rates 2022 - SCHEDULE "B"		
DESCRIPTION	Full Rate	Discount Rate (10%)
a) Residential use, per dwelling unit or service	497.15	447.43
b) Commercial or non-residential use, per unit or service	497.15	447.43
c) Commercial Car Wash, per service	663.68	597.31

II. General Taxation

The remainder of the services provided by Montrose is supported by general tax revenue from property tax, utility tax, business tax, and vacant land tax. Tax rates are set based on yearly budgets and projections of sustainable infrastructure investment. The 2022 rate schedule is set out in [Bylaw #768](#)

	Description	Property Class		
		1 Residential	2 Utilities	6 Business
A	General Municipal & Unspecified Debt Tax Rate	1.26400	4.42400	3.16000
B	Municipal Finance Authority	0.00020	0.00070	0.00050
C	Regional District Kootenay Boundary Tax Rate	2.51700	8.80950	6.16665
D	West Kootenay Boundary Regional Hospital District Tax Rate	0.16250	0.56875	0.39813
E	British Columbia Assessment Authority Tax Rate	0.03490	0.46620	0.10360

Note: Rates are expressed in \$ per \$1,000 of taxable assessment

III. Debt Strategy

Debt strategies will consider the long-term life-cycle cost of infrastructure which will include initial capital requirements less funding, debt servicing requirements, allowance for maintenance cost over the life of the infrastructure, annual operations cost required to provide the service desired from the infrastructure and decommissioning or replacement cost at end of life. Debt spending will be used to maintain infrastructure services if:

- a level of service assessment has been completed for the existing or proposed infrastructure,
- the service has been deemed essential for the community,
- the community, via the council, is aware of the lifecycle cost of infrastructure, and
- The analysis has considered impacts on other essential service areas.

The Village has a small loan on a fleet vehicle. The loan will be paid in two years at approximately \$25,000 per year.

IV. Funding Potential

Capital infrastructure works funding is supplemented by applications to provincial and federal levels of government, as well as governmental agencies and nonprofits that direct funding to municipal government to support capital works projects. Funding from these sources is not typically released according to long-term plans, so the availability of funding used in this planning document is, by necessity, speculative and based on historical availability. Sources of funding that can be pursued to support capital works projects are:

- Gas Tax Agreements
- Municipal Operating Grants
- Debt Servicing Grants and Subsidies
- Special Assistance Funds
- Community Enhancement Employment Program
- Municipal Capital Works and Cost-Shared Funding Programs
- Federation of Canadian Municipalities Green Municipal Fund

Montrose has a target funding threshold of, on average, 60% of capital project spending over the long term. This percentage is used in combination with the Village's projected annual infrastructure demand to set capital investment targets.

4. Regulatory Environment

Montrose's regulatory environment relates to drinking water, wastewater effluent and facility regulations. A placeholder for climate change regulations exists to record their expected introduction in the upcoming years.

I. Drinking Water

Drinking water is monitored and tested based on the *Water Act Water Supply System And Wastewater Treatment System Regulations* as per regulations. Montrose complies with regulations and water tests are done by staff regularly.

II. Wastewater Effluent

The Village complies with all wastewater regulatory requirements.

III. Stormwater

Currently, there are no adopted guidelines in BC that regulate stormwater management. Stormwater will be managed in accordance with Montrose's policies, planning documents and guidelines.

IV. Facilities

Municipally owned and operated facilities are to (at a minimum) be maintained in compliance with the BC Building Code at the time that they were constructed. Continuous updates to the building code related to safety and accessibility occur over time and require significant funding.

Montrose's hierarchy of performance for facilities is as follows:

- All buildings and facilities will comply with the BC Fire Code and BC Health Act regulations.
- Facilities will be upgraded for code compliance issues that pose an imminent risk to life and safety as soon as possible;
- All new construction will comply with the latest version of the BC Building Code;
- Existing facilities will be maintained such that performance meets at a minimum the code requirements at the time they were built; and
- Existing facilities or parts of facilities that require renovation to continue providing services will incorporate the latest building code requirements.

V. Climate Change

Currently, there are no adopted guidelines in British Columbia that regulate climate change adaptation or mitigation. Climate change adaptation and mitigation will be managed in accordance with the Village's policies, planning documents and guidelines.

5. Capital Investment Strategy

The focus of public commentary and complaints is often based on the condition of visible, above-ground infrastructure and, due to the political nature of local government, can have a large impact on capital investment. It is necessary to strategically allocate Montrose’s finite capital funds with respect to all infrastructure.

Montrose has adopted a risk management approach in prioritizing infrastructure capital investment. This approach is based on the principle that risk cannot be eliminated but can be managed to an acceptable level. This risk-based approach seeks to balance the continuation of high-priority services with capital investment that is acceptable to residents and stakeholders. Capital investment will prioritize high-risk assets first.

I. Defining Risk

Risk is defined by two factors: Probability of failure (PoF) and Consequence of failure (CoF).

Probability of Failure

PoF is related to the estimated remaining life of an asset shown in this table:

Table 1: Probability of Failure

PoF Rating	PoF Description	Estimated Remaining Life
1	Rare	More than 30 years
2	Unlikely	Between 15 and 30 years
3	Possible	Between 5 and 15 years
4	Likely	Between 0 and 5 years
5	Almost Certain	Less than 0 years

The estimated remaining life is calculated using a combination of condition values, age values, and expected lifespan values. PoF values automatically update with each passing year, and as infrastructure renewal and condition values are updated in Montrose’s asset register.

Consequence of Failure

CoF is based on the potential environmental, legal, economic, and social impacts of an asset failing.

Table 2: Consequence of Failure

CoF Rating	CoF Description
1	Minor
2	Moderate
3	Significant
4	Major
5	Catastrophic

CoF values were defined by staff and approved by elected officials for all Montrose’s assets. CoF values should be reviewed by staff and elected officials regularly.

Risk Matrix

A risk value is obtained by combining probability of failure and consequence of failure values as per the following matrix. It is common asset management practice to shift the matrix in favour of the consequence of failure, as seen below.

Table 3: Risk Table

Probability of Failure	5 Almost Certain	11 Low	16 Medium	20 High	23 Extreme	25 Extreme
	4 Likely	7 Minimal	12 Low	17 Medium	21 High	24 Extreme
	3 Possible	4 Minimal	8 Low	13 Medium	18 Medium	22 High
	2 Unlikely	2 Minimal	5 Minimal	9 Low	14 Medium	19 High
	1 Rare	1 Minimal	3 Minimal	6 Minimal	10 Low	15 Medium
		1 Minor	2 Moderate	3 Significant	4 Major	5 Catastrophic
		Consequence of Failure				

II. Priority of Capital Projects

Montrose has assigned a risk value to each asset in its asset register. Five-year capital plans are created by allocating the expected budget to capital projects, which address infrastructure in this order:

1. **Extreme risk**
2. **High risk**
3. **Medium risk**

In the event that there is budget remaining and no more unallocated extreme-risk or high-risk assets, medium-risk projects may be accelerated to prevent unsustainable infrastructure deficits in the future.

4. **Reserve contributions**

In the event that there is budget remaining after all extreme, high, and accelerated medium risk assets have been allocated, Montrose may contribute to reserve targets.

5. **New infrastructure**

If all reserve and spending targets are met, there may be an opportunity to invest in new infrastructure. Montrose will evaluate infrastructure investments from a life-cycle cost perspective to ensure that decisions are sustainable.

III. Continuous Risk Management

Capital investment is about managing risk. On one hand, overall infrastructure risk is reduced by completing infrastructure renewal on extreme, high and medium risk assets. On the other hand, overall infrastructure risk continually increases as infrastructure ages because the probability of failure increases. By meeting capital spending and reserve targets that match the level of infrastructure demand, Montrose ensures that infrastructure deficits do not create unmanageable infrastructure risk levels for future generations.

IV. Level of Service

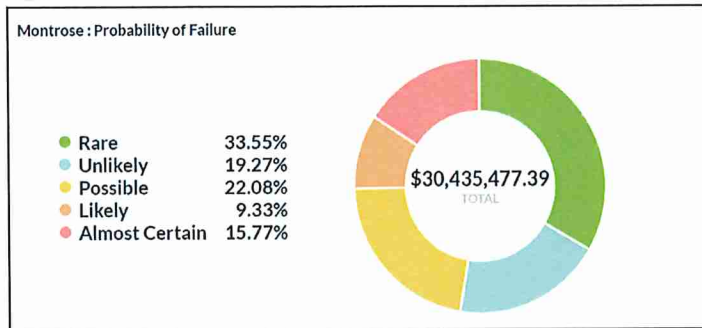
The levels of service currently provided by the village are considered to be at an acceptable level. No required increase or decrease of service levels or level of service gaps related to regulatory requirements were identified. The Council and staff will reassess the level of service annually and take into account any changes when a risk assessment is done. Increasing levels of service beyond current levels will require an increase in capital spending and reserve funding beyond that identified in this report.

Service Area	Level of Service Statement
Water Treatment and Distribution	No formal levels of service have been defined. The Village will continue to evaluate and meet existing levels of service for all service areas.
Wastewater Collection and Treatment	
Stormwater Collection	
Transportation	
Buildings, Parks, and Recreation	
Fleet and Equipment	

6. Risk Profile

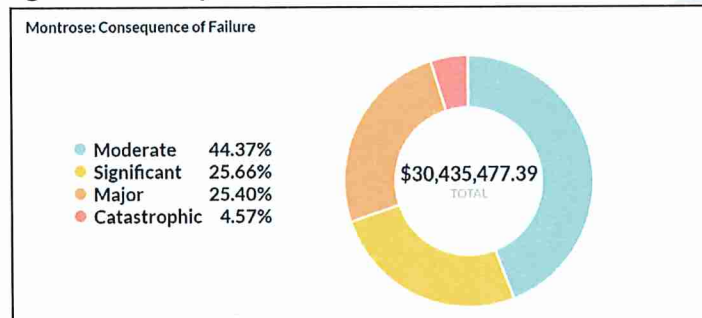
This section gives a brief overview of the assets captured in Montrose’s asset management system. Montrose’s PoF, CoF, and Risk maps and graphs are available on mycivitas.ca.

Figure 2: Probability of Failure Profile



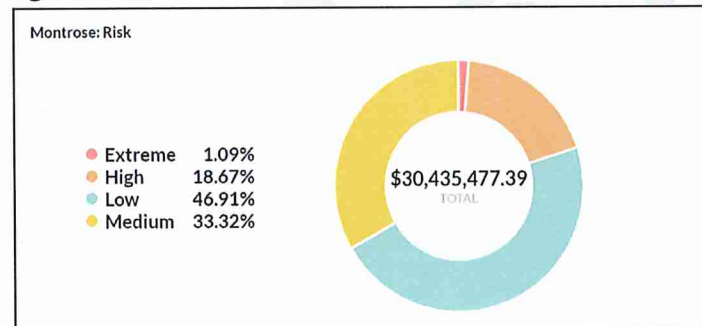
About 53% of Montrose’s asset value has a PoF of “rare” and “unlikely”. Approximately 22% of the assets have a “possible” PoF, and approx. 25% of the assets are classified to be “likely” or “almost certain” to fail.

Figure 3: Consequence of Failure Profile



Approximately 30% of Montrose’s asset profile consists of catastrophic or major CoF while 25% is classified as significant. Approximately 45% are classified with a moderate consequence of failure.

Figure 4: Risk Profile



The risk value is based on the CoF and PoF values and reflects the overall risk profile of the village’s assets. Almost 47% of Montrose's assets were determined to be low risk, almost 33% medium risk, and approximately 20% high or extreme risk.

Figure 5: Risk Map

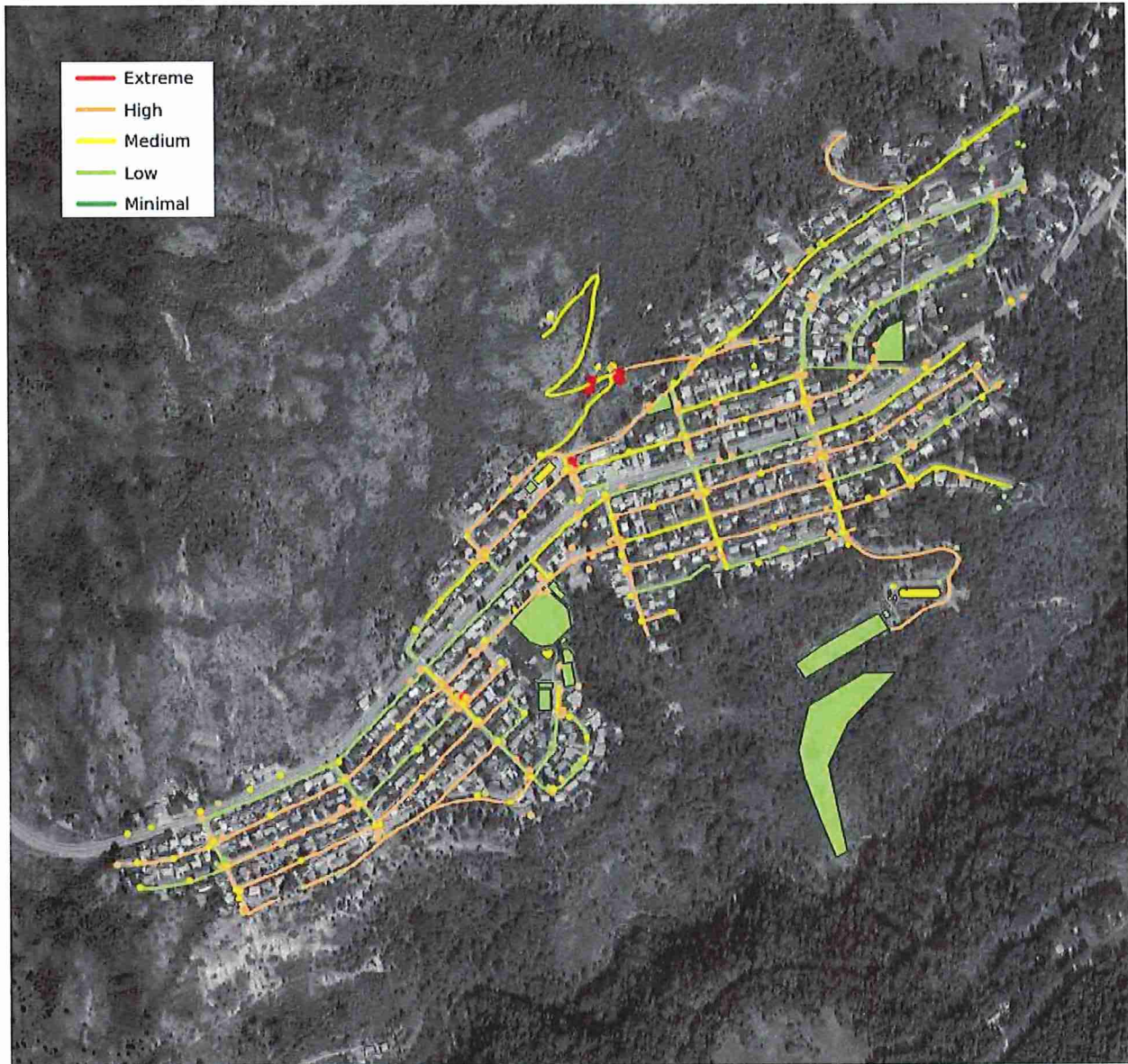


Figure 5 is a screenshot of a heat map showing the risk associated with the various assets. Detailed interactive maps of the Village's PoF, CoF, and risk are available on mycivitas.ca.

Figure 6: Risk Profile and Timeline

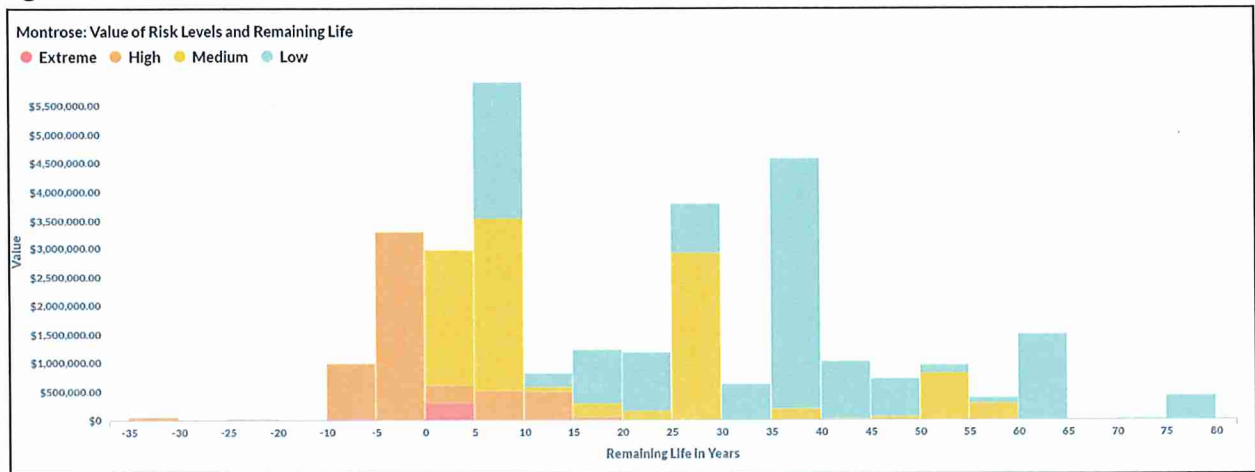


Figure 6 shows the remaining life of assets and their renewal value. The assets are grouped by risk level.

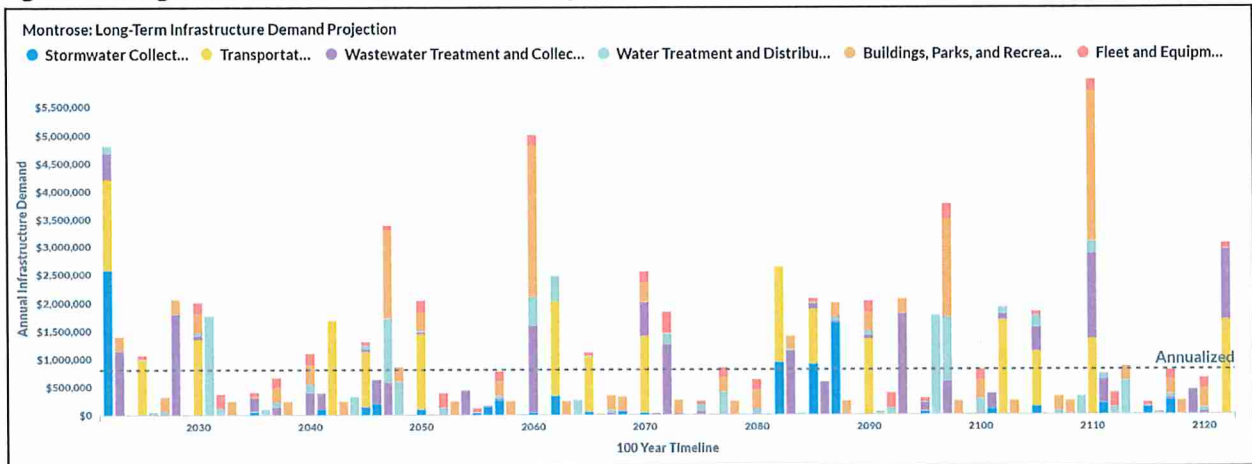
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7. Capital Demand Projections

I. Long-Term

Figure 7 shows a projection of Montrose’s long-term infrastructure demand over the next 100 years. An annualized long-term infrastructure demand of \$800,000 is estimated from available data.

Figure 7: Long-Term Infrastructure Demand Projection

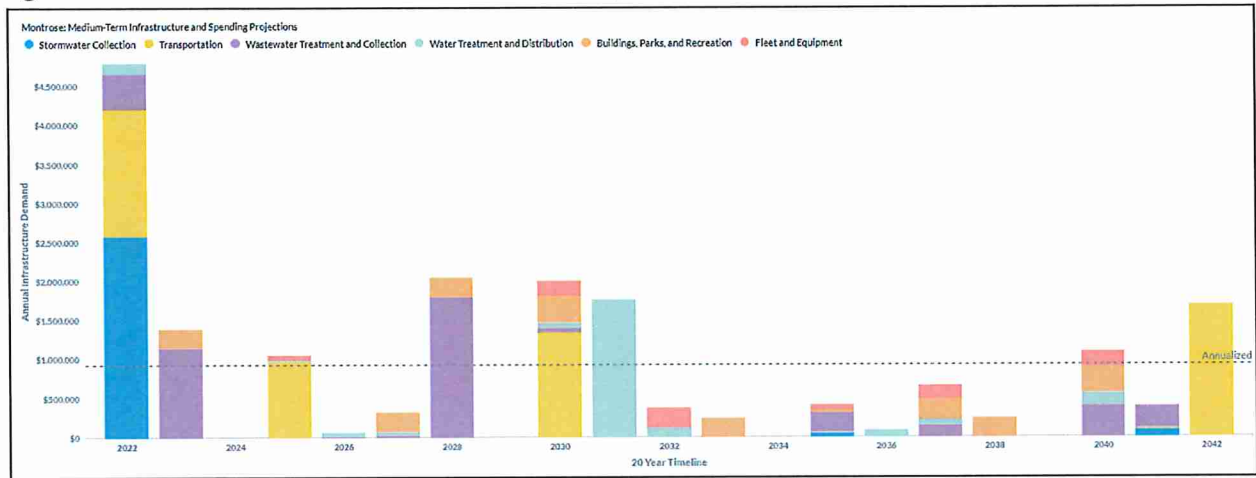


This annualized value is obtained by dividing the renewal cost by lifespan for each asset in the database and then summing the total. Generally, the annualized long-term infrastructure demand should be used as a target for annual capital investment. Assuming 60% funding, the target municipal contribution for capital infrastructure investment for Montrose is \$320,000 annually. As lifespan and renewal cost data are updated, the annual capital infrastructure demand will update. As such, the Village may lower the annual infrastructure demand by committing to operations and maintenance programs to extend lifespans, deciding to rehabilitate versus replace, and more.

II. Medium-Term

Figure 8 shows Montrose's medium-term infrastructure demand over the next 20 years. An annualized medium-term infrastructure demand is estimated at \$930,000 from available data. Notice that the 20-year annualized demand is substantially more than the long-term annualized demand. Therefore, Montrose should expect to see a decreased capital demand in the long term.

Figure 8: Medium-Term Infrastructure Demand Projection



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8. Capital Works Recommendations

The following capital works recommendations are based on the village's infrastructure risk profile, existing capital projects, and input from staff and consultants.

I. Water Treatment and Distribution

[Place holder]

II. Wastewater Collection and Treatment

[Place holder]

III. Stormwater Network

[Place holder]

IV. Transportation Network

[Place holder]

V. Buildings, Parks, and Recreation

[Place holder]

VI. Fleet and Equipment

[Place holder]

9. Financial Programs and Pro-Forma Budgets

All financial estimates are gross values that do not consider funding from outside sources. Where applicable, the cost basis of capital projects is based on estimations consisting of:

65%	Capital Costs
15%	Contingency
10%	Design
10%	Inspections and Removal

In some cases, where this general formula is not applicable, or a project requires significantly less or more effort in one of the above areas, a custom cost is applied to the project components in the capital program and in the inventory database.

I. Five-Year Capital Plan

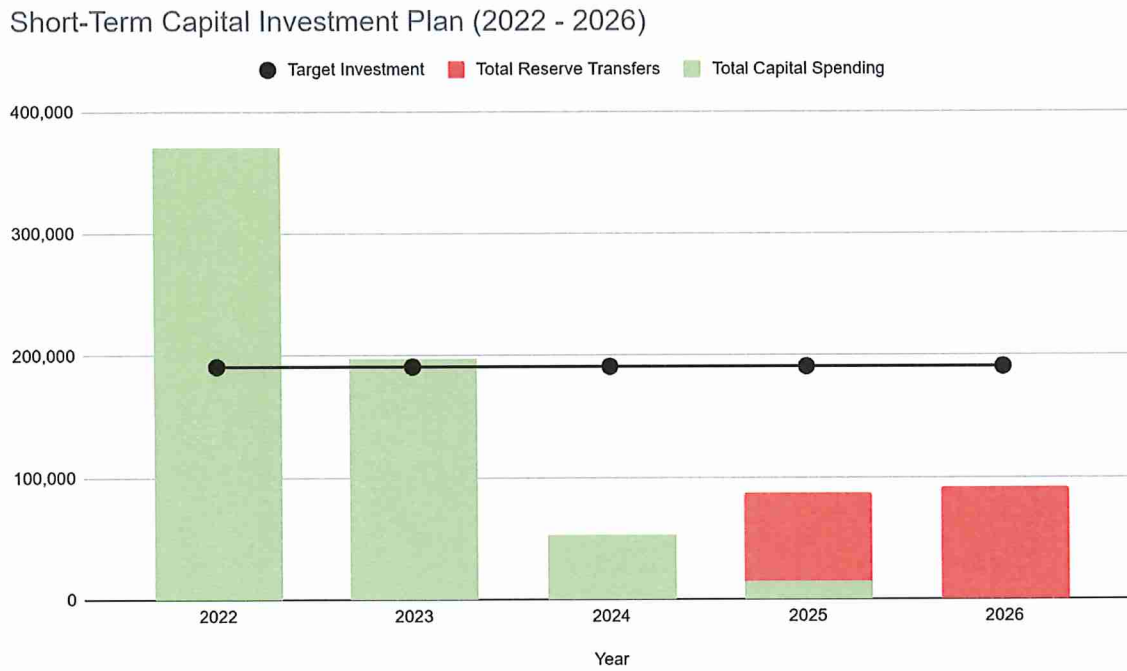
[Draft text and graphs for future report updates]

Below is a 5-year capital plan based on the recommendations set out in Section 8 above.

Table 4: Short-Term Capital Plan

		Year	2022	2023	2024	2025	2026
Capital Projects							
		Total Capital Spending					
Reserve Transfers	Water						
	Wastewater						
	Roads and Stormwater						
	Buildings						
	Fleet and equipment						
	Total Reserve Transfers		0	0	0		
Total Capital Investment							
Target Investment							

Figure 8: Short-Term Capital Plan



II. Operations and Maintenance

Continuous Improvement Program

The following tasks will be completed annually and are certified completed in support of this Short-Term Capital Program:

Update Asset Register	An asset database has been created and updated by LandInfo. Visit mycivitas.ca for the recent data with support from Montrose staff and Council.
Review Risk Assessment and Level of Service	Risk assessment was performed with support from Montrose staff and Council.
Update Capital Plan	An asset management capital plan was created by LandInfo with support from Montrose staff.
Review Asset Management Policy	An asset management policy was drafted by LandInfo with support from Montrose staff and Council.

Last completed on:	October 2022
Person responsible:	
Signature of completion:	<div style="border: 2px solid black; width: 100%; height: 20px;"></div>
Next asset management update due on:	October 2023