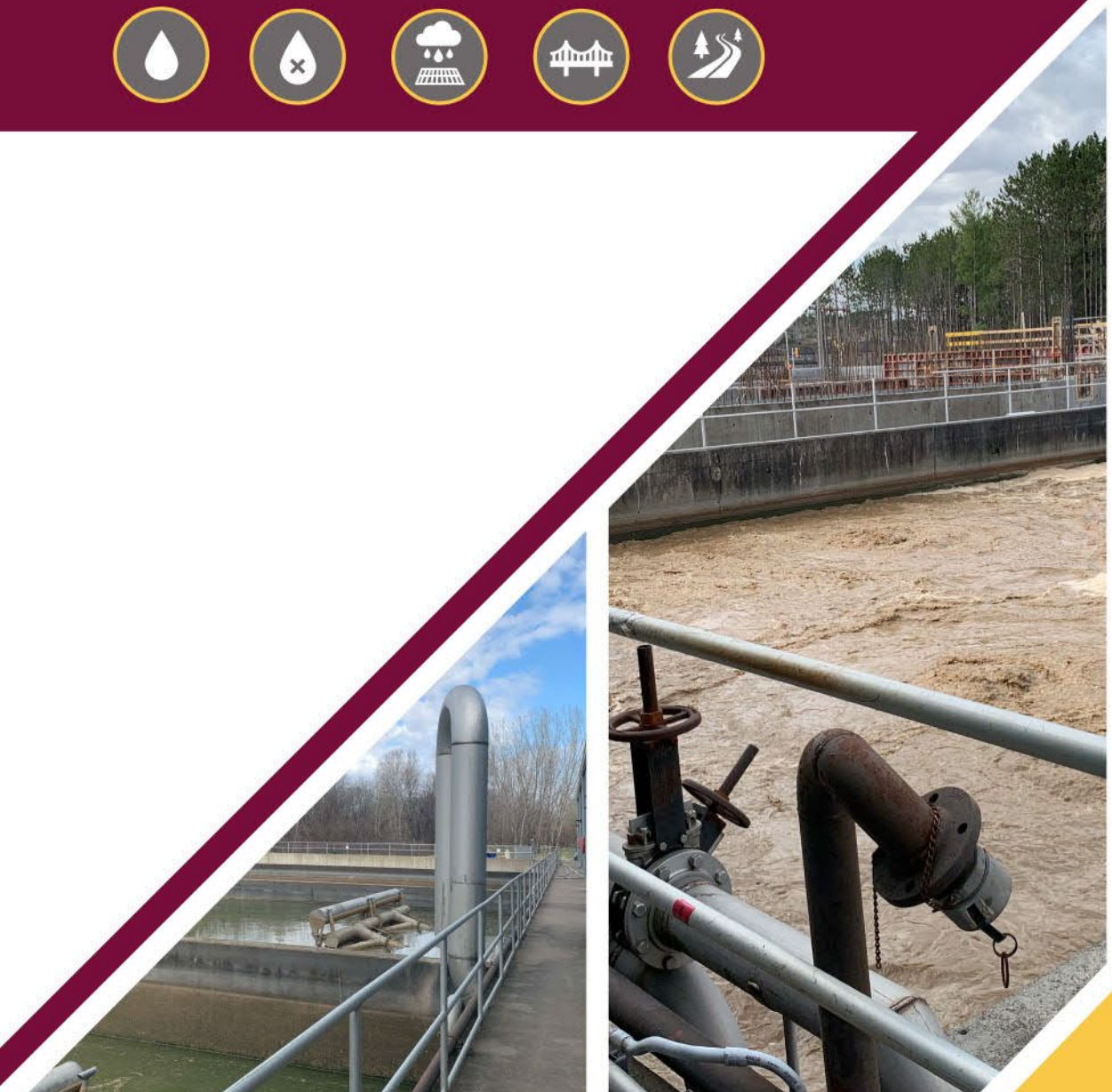
Clarence-Rockland

City of Clarence-Rockland

Core Asset Management Plan

June, 2022



OVERVIEW

The City of Clarence-Rockland is located on the banks of the Ottawa River, 32 kilometres east of Parliament Hill and 145 kilometres west of Montreal. Clarence-Rockland is made up of several hamlets: Bourget, Cheney, Clarence, Clarence Creek, Hammond, Rockland, and Saint-Pascal-Baylon.

The City delivers core transportation, water, wastewater and stormwater services to a population of approximately 27,000 people. These services, which vary according to the mixture of urban and rural nature within each hamlet, are supported by $722 million in core infrastructure assets. The 3D cross section on the next page illustrates the City's core infrastructure. The City also delivers non-core services such as recreation, social and cultural, protective, planning and development.

Asset Management

The City has established a comprehensive approach to managing its assets which is a key component of the Clarence-Rockland planning process. This approach is guided by the Corporate Asset Management Policy (2019), a Comprehensive Corporate Asset Management Strategy (2020) and an Asset Management Plan (this document). The preparation of Asset Management Plans (AMPs) is generally considered good practice and is a requirement of Ontario Regulation 588/17 (O. Reg. 588/17).

Responsibility for the asset management function is laid out in the City's AM Policy, which describes involvement throughout the organization. The Asset Management Steering Committee is responsible for developing and administering the AMP. Staff actively collaborate, working across departments to effectively manage City assets and deliver services.

A key concept in ISO 55000: Asset Management is developing a "line of sight" between strategic plans and objectives through to tactical decision-making and associated actions. Clarence-Rockland's Asset Management Program aligns with other corporate plans and strategies, including the Strategic Plan, Official Plans, Development Charges, Community Improvement Plan, Multi-Modal Transportation Master Plan (MMTMP), Stormwater Master Plan, and to the extent possible the Water and Wastewater Master Plans currently under development.

Plan Scope

This AMP is focused on the City's core services: roads, bridges and culverts, water, wastewater and stormwater. It takes a service-focused approach that considers the consequences of asset failure on the City's objectives, renewal activities based on the risk to service delivery, and the capability of the system as a whole to deliver services.

The AMP has a planning horizon of 10 years, from 2022 to 2031, however the full lifecycle of assets has been considered strategically where appropriate. The City is planning to update the AMP every 3-5 years to comply with O.Reg. 588/17 and promote increasing maturity in asset management practices. Future updates will be undertaken in coordination with master planning processes.

27,000
PEOPLE

$722 M
CORE
INFRASTRUCTURE

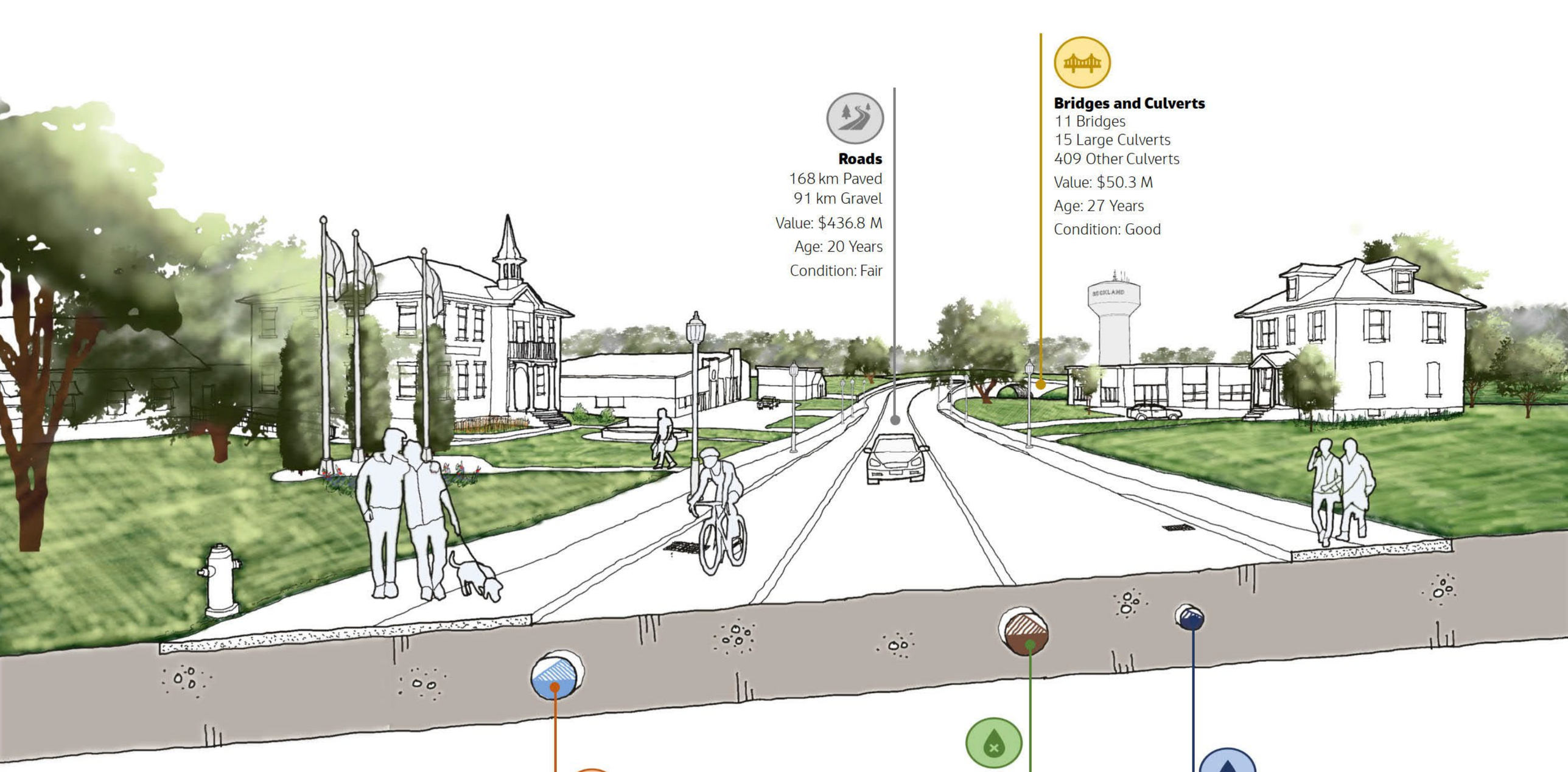
Roads

Bridges &
Culverts

Water

Wastewater

Stormwater



Roads
168 km Paved
91 km Gravel
Value: $436.8 M
Age: 20 Years
Condition: Fair

Bridges and Culverts
11 Bridges
15 Large Culverts
409 Other Culverts
Value: $50.3 M
Age: 27 Years
Condition: Good

Stormwater
70 km Stormwater Pipes
400 km Roadside Ditches
1,636 Catch Basins
27 Municipal Drains
Value: $63.5 M
Age: unavailable
Condition: Very Poor

Wastewater
59 km Wastewater Pipes
9 Wastewater Facilities
Value: $71.5 M
Age: 30 Years
Condition: Poor

Water
141 km Water Pipes
6 Water Facilities
Value: $99.5 M
Age: 20 Years
Condition (Facilities): Very Good

CITY-WIDE

State of Local Infrastructure

The assets covered in this AMP represent a replacement value of approximately $722 million. Roads make up over half of this asset base, followed by water, wastewater, stormwater, bridges and culverts.

Infrastructure decisions have a long-lasting impact because assets have service lives that span decades. Once assets deteriorate to a certain point, they can no longer be repaired effectively and will require replacement at significant cost. However, targeted maintenance earlier in an asset's lifecycle can extend its life, maximizing the investment the City has made in its core infrastructure.

The City's core infrastructure is midway through its life expectancy. The average age of the City's assets is 23[1] years. The overall condition of the City's core assets is considered to be fair, which means a significant portion of the City's asset base is showing signs of deterioration and requires attention. The state of the City's assets is summarized using a standardized condition scale shown below.

AMP Condition Grading

Very Good	Fit for Future: well maintained, good condition, new or recently rehabilitated
Good	Adequate for Now: acceptable, generally in mid stage of expected service life
Fair	Requires Attention: signs of deterioration, requires attention, some elements exhibit deficiencies
Poor	Increasing potential of affecting service: approaching end of service life, condition below standard, large portion of system exhibits significant deterioration
Very Poor	Unfit for Sustained Service: near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable.

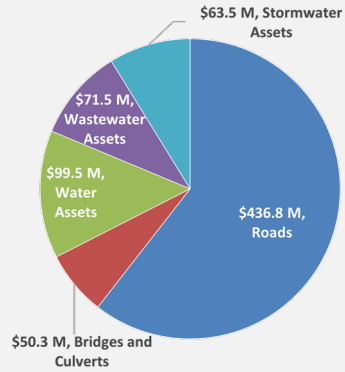
The data used to present the state of local infrastructure was drawn from the City's asset inventory, and supplemented by data from staff where gaps existed.

Levels of Service

Levels of service (LoS) are the specific parameters defining services that the City provides to users, such as potable water and flood protection. They enable the City to measure the performance of services being delivered, and to make decisions about infrastructure assets based on how they support the City in providing these services.

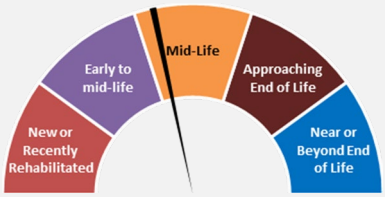
The City of Clarence-Rockland has established a suite of effective LoS measures for the City's core service areas that meet the requirements of O. Reg. 588/17. This AMP focuses on Customer LoS and current performance, particularly elements that are currently influencing the City's ability to continue maintaining services at present levels over the next 10 years.

260 KM ROADS
11 BRIDGES
409 CULVERTS
141 KM WATER PIPES
59 KM WASTEWATER PIPES
70 KM STORMWATER PIPES
6 WATER FACILITIES
9 WASTEWATER FACILITIES

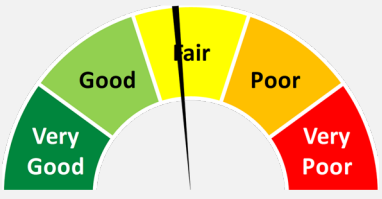


VALUATION

23 YEARS
AVERAGE AGE



LIFE CONSUMED



CONDITION

[1] Excluding the stormwater assets as the age data for this asset category has major gaps.

Stakeholders noted that infrastructure in general is both a strength and threat for the City, with roads and ditches a weakness, and water and sewer an opportunity.[2]

There are a series of factors that are currently influencing the City's ability to continue providing core services at current levels. There are also factors that are positively influencing the ability to deliver service. The overarching factors, in addition to short term staffing and cost/supply effects from the Pandemic, are:

- Climate Change
- MECP Parameters
- Vendor Supply
- Rapid Growth
- Cost of Infrastructure
- Technology Changes
- Processes & Procedures

Positively, the proactive inspections and planning through OCWA's operations and maintenance of the water and wastewater systems has resulted in increasing performance (eg. fewer water and sewer pipe breaks).

Asset Management Strategy

Asset Strategies are about optimizing and managing assets over their lifecycle using a systematic approach. Effective strategies can minimize risk, extend service life, and ensure that investments are being maximized. These strategies are linked to the level of service that the City is working to achieve. Future demand drivers include rapid growth, environmental responsibility and changes to policy and legislation. Growth is the most significant demand driver, and accommodating growth is a priority for the City.

Future Demand Drivers

Clarence-Rockland, like the broader area of the United Counties of Prescott and Russell (UCPR), has experienced unprecedented growth. It has been challenging to address infrastructure needs in proportion to the speed of growth. With this in mind, the more recent growth forecasts from the Development Charges (DC) program have been used as opposed to the forecasts from the UCPR's Official Plan. These growth forecasts for 2019-2028 are presented below.

Forecasted Growth	2028 Totals	2019-2028 Growth
Population	29,829	4,313
Housing Units	11,517	1,810
Employees	1,810	610

In accordance with the City's Official Plans and the UCPR, growth is being directed to areas where full municipal services are available; intensification and redevelopment are promoted wherever feasible to optimize the use of the services. Approximately 80% of the City's growth is occurring in the urban area. For the Village of Bourget an additional 142 dwelling units are anticipated which will necessitate a minimum land supply of 48 gross hectares. The Village of Bourget will experience moderate growth in the short term and will expand significantly over the longer term when municipal wastewater infrastructure services are implemented.

Some service areas such as water and sewer have been able to accommodate planned growth, however there are capacity issues with unplanned growth or growth occurring faster than expected. Other service areas such as the

[2] Strategic Plan (2015-2021) consultation

road network have experienced challenges with the availability of qualified City operations staff in addition to changing service needs.

The City is committed to maintaining infrastructure in an environmentally responsible manner through timely rehabilitation work that considers protecting the environment. As the City grows, further pressure will be placed on sound environmental stewardship.

Changes to regulatory requirements due to new Ministry of the Environment and Parks (MECP) parameters are affecting the affordability of services being delivered. Furthermore, the preferred approaches emerging from the Stormwater Management Planning and Design Manual have become more focussed on lot-level techniques and use low impact development to manage rainfall closer to where it falls which will likely support more environmentally responsible development.

Lifecycle Management Activities

Lifecycle management activities are actions undertaken with respect to infrastructure assets over their full service life, including: planning, designing, constructing, maintaining, operating, renewing and decommissioning. The focus is on maintaining, operating, renewing and decommissioning stages of the process. Decisions regarding planning, design and construction are made as part of the master planning and capital planning processes.

Staff believe that there is an urgent need to revisit practices for the timely rehabilitation of the City's assets in order to prevent the overall condition of the City's infrastructure network from declining significantly, which would result in the need for premature replacement to continue providing core services at current levels into the future.

A preliminary top-down assessment on risks was conducted with City staff as part of developing this AMP. The risk assessment utilized the City’s Risk Framework to describe risk and identify possible risk treatments for each asset service area. Optimizing available funding to implement "just-in-time" infrastructure improvements will demonstrate responsible risk management in addressing aging infrastructure.

Financing Strategy

Historical Expenditures

Operating expenditures for the City's core services over the last 5 years have been on average approximately $12 million annually. Roads make 53% of this spending, water 22%, wastewater 14%, stormwater 8% and bridges and culverts 3%. Capital renewal and rehabilitation expenditures for all core systems over this period have been on average approximately $4 million annually. Almost half of this spending has been on the City's roads, which make up 60% of the City's asset base according to replacement value. Estimated growth and enhancement expenditures have been on average $0.3 million annually (not including developer contributions). This has been focused specifically on water, stormwater and roads projects in 2019.

Forecasted Expenditures

The City does not currently maintain operational or capital forecasts that go beyond next year's budget so historical averages have been used as an indicator for the future. Operating expenditures are projected to be roughly $12 million annually over the next decade, with an additional $4.2 million for capital renewal and in excess of $2.4 million for City-funded growth and enhancement excluding stormwater projects.

Revenue Sources

After operating expenses, revenue for the City's core services available for capital renewal and growth/enhancement is projected to be $4.5 million annually over the next 10 years, including $3.6 million for transportation (roads, bridges and culverts, and stormwater), $700,000 for water, and $150,000 for wastewater. This does not include the 2022 budget as revenue is expected to be higher, particularly for roads where the OCIF grant is doubled from previous years and for wastewater. It also excludes any revenue from the Development Charges (DC) Program.

Infrastructure Gap

The infrastructure gap is the difference between the available funding and the funding required to deliver the asset strategies.

$$Infrastructure\ Gap = Funding\ for\ Asset\ Strategies - Available\ Funding$$

The cost estimates come from a range of sources and are in some cases using City data that is incomplete and/or out-of-date and so they need to be treated with caution. As a result, the infrastructure gap is discussed in a qualitative manner.

The largest infrastructure gap appears to be the paved roads and at current levels of expenditure the overall condition of the road network is likely to continue to decline. Furthermore, the new gravel road strategy assumes that the thin granular top-up is funded from operational expenditures but this has not been explicitly added to the future operational budget.

HISTORICAL

$12 M
OPERATING EXPENDITURES

$4 M
CAPITAL RENEWAL EXPENDITURES

$300 K
GROWTH/ENHANCEMENT CAPITAL EXPENDITURES

FORECASTED

$12 M
OPERATING EXPENDITURES

$4.2 M
CAPITAL RENEWAL EXPENDITURES

$2.4 M
GROWTH/ENHANCEMENT CAPITAL EXPENDITURES

INFRASTRUCTURE GAPS

- PAVED ROADS
- GRAVEL ROADS
- WASTEWATER
- STORMWATER
- GROWTH PROJECTS (CITY'S CONTRIBUTION)

ROADS

The road network consists of several different road types including arterial, collector, local and private roads. The City owns, operates and maintains collector, local and gravel roads. Arterial roads are under the jurisdiction of the United Counties of Prescott and Russell and therefore excluded from the scope of this AMP.

State of Local Infrastructure

There are 157 linear km of paved collector roads, 11 km of paved local roads and 91 km of gravel roads, with a combined replacement value of approximately $436.8 M. Paved roads have an average age of 20 years. Gravel roads are continuously maintained, so life expectancy is evaluated differently.

The paved roads are in fair condition, meaning a significant portion are showing signs of deterioration and require attention. The condition of gravel roads is not being tracked in a formal way, however based on qualitative sources the surface condition is also fair. Gravel roads condition can fluctuate rapidly based on various factors such as weather and usage. In general, the City is able to maintain this type of roads in a good state of repair.

Levels of Service

The current LoS for roads is presented in the table below, centred on providing infrastructure that connects users across the City, and ensuring roads are well maintained and safe to use. Paved roads have an average pavement condition index of 53 (weighted by replacement value), which as noted above is considered to be fair. Gravel roads have an average surface condition of fair. It is important to note that stakeholder consultation showed only a 22% level of satisfaction with street repairs (Strategic Plan 2015-2021). The City is taking steps to establish a City-wide strategy for the road network, and increase the overall condition of gravel roads.

Community LoS	Technical LoS	Performance[1]		
Transportation infrastructure connects users across the City	# of ln km of each of collector roads and local roads as a proportion of km^2 of land area of the municipality	**Collector Roads**		**0.09**
		Paved		0.09
		Gravel		0.00
		Local Roads		**1.65**
		Paved		1.06
		Gravel		0.59
		2021	**2020**	**2019**
Roads are well maintained	Paved roads: average pavement condition index value[2]	53	55	58
	Unpaved roads: average surface condition	Fair	Fair	Fair
Roads are safe to use	Roads are routinely inspected to provincial standards (MMS)	100%	-	100%

[1] *Land area of the City of Clarence-Rockland is 297.47 km^2*

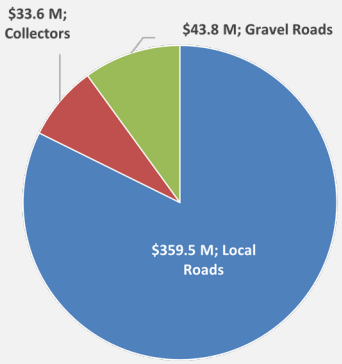
[2] *Condition is weighted based on replacement value*

157 KM
COLLECTOR ROADS

11 KM
LOCAL ROADS

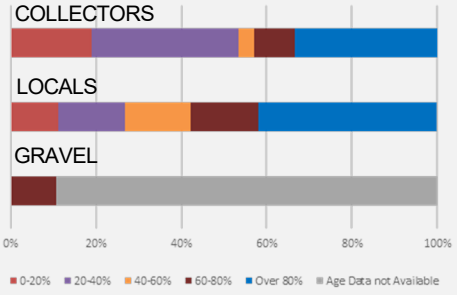
91 KM
GRAVEL ROADS

$436.8 M
ROAD INFRASTRUCTURE

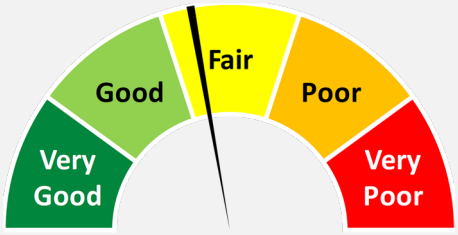


VALUATION

20 YEARS
AVERAGE AGE

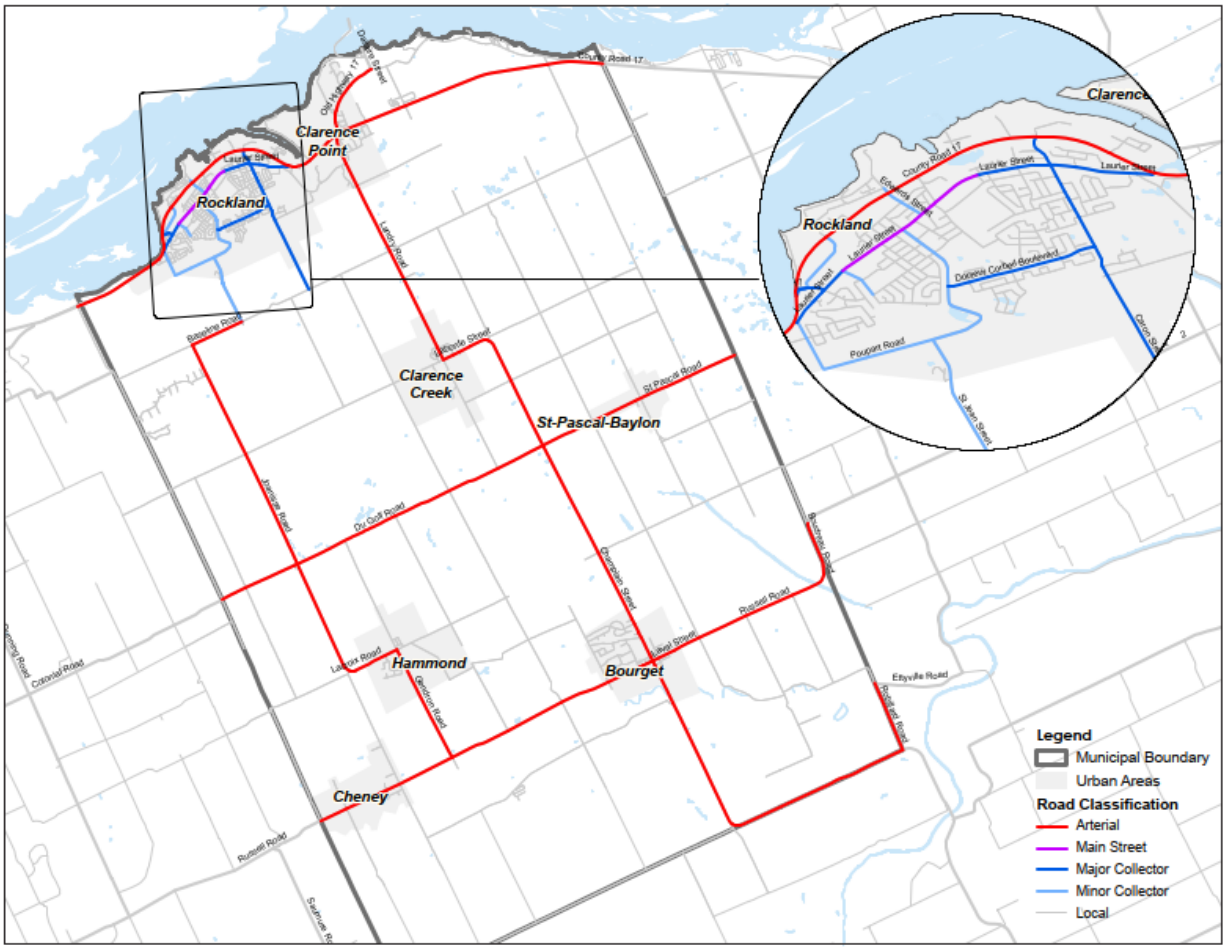


LIFE CONSUMED



CONDITION

Road classification levels are illustrated below. Collector roads have a design speed of 50-60 km/h, with an interrupted flow that accommodates a range of vehicle types. Collector roads serving residential areas are designed to accommodate approximately 8,000 vehicles per day while collector roads serving commercial and industrial areas are designed to accommodate 1,000 to 12,000 vehicles per day. Local roads have a design speed of 30-50 km/h, with an interrupted flow that accommodates passenger and service vehicles. Local roads are intended to provide access to individual properties and have been designed to accommodate approximately 1,000 vehicles per day for servicing residential areas and 3,000 vehicles per day for servicing commercial areas.



Source: Multi-Modal Transportation Master Plan (2019)

Asset Management Strategy

Growth

The MMTMP is very growth-centric, with total capital costs for the over the next 15+ years totaling almost $65 million, of which approximately 85% are eligible for recovery through DC mechanisms. Given budget limitations, the City has decided to proceed with $31 million in growth and enhancement work over the next 10 years, of which $15 million will need to be funded by the City. The recommended vehicular network comprises a mixture new roadways, extensions, widenings, and intersection improvements to primarily accommodate new growth areas within Rockland.

Lifecycle Activities

Council indicated a need for a comprehensive approach to manage gravel roads across Clarence-Rockland in order to improve performance and reduce complaints. Recognizing that the cost of maintaining gravel roads is significant, a strategy has been developed to have a positive impact on long-term road network performance and ultimately the City's operating and capital investment efficiency. As part of the City's O&M practices, a thin 75 mm layer of granular will be applied to City streets on a 3-5 year timeframe, thereby increasing the pavement structure every cycle. In instances where a road requires 300 mm inches or more, it will be identified as a capital project. Additional approaches such as recycling granular and dust suppression will also be considered.

Clarence-Rockland Asset Management Plan (2022)

A summary of road network lifecycle activities is presented in the table below.

Maintenance & Operations	Renewal

• Undertaken by City staff or contracted out
• Paved roads
  – Summer maintenance: filling potholes, sweeping, pavement markings, crack sealing, drainage and ditching
  – Winter maintenance: snow clearing/removal and occasionally filling potholes
  – MMS classification used to respond to complaints
  – Condition assessments linked to a road deterioration model (last completed in 2011; informed the 10 year plan)
• Gravel roads
  – Apply 3 inches of granular on a 3-5 year rotation
  – Dust suppression
  – Track complaints or inspection deficiencies through work orders
  – Drainage and ditching maintenance program
• Transportation master planning (every 5 years)
	• Geotechnical investigation and CCTV to confirm road condition and rehabilitation approach
	• Budget submitted and considered from a multi-utility perspective
	• Paved roads - collector
	  – Mill and pave, microsurfacing or pulverize and pave to extend life expectancy
	  – Full reconstruction
	• Paved roads - local
	  – Prioritization according to PCI
	  – Evaluate connectivity
	  – Mill and pave or pulverize (PCIs closest to 35 first, moving to PCIs around 60 by 2024/25)
	• Gravel roads
	  – In past have applied 12 inches of granular on 1 section of road annually
	• Undertaken by City staff or contracted out depending on size

Disposal	**Non-Infrastructure Solutions**
• Removal costs (e.g. for surfaces) are broken out of a paved road project for recording in the financial system • Disposals not recorded in financial system for gravel roads because work is generally topping up as opposed to removal	• Designated truck routes • Load restrictions

Roads are routinely inspected to the Provincial Minimum Maintenance Standards (MMS). Condition assessments for paved roads are linked to the City's road deterioration model. They were last completed in 2011 and will be updated this summer. Geotechnical investigations and CCTV are used to confirm road condition prior to rehabilitation work. There is no formal condition assessment process for gravel roads, however work orders are being used to track inspection deficiencies and complaints.

Risks

Potential risks to maintaining the current level of service for the road network include:

- An increase in material costs such as fuel, resulting in a decrease in the overall amount of work that can be completed within exiting budgets
- Flooding of rural areas due to climate change, resulting in annual events where roads are no longer passible and access to rural areas cut off
- Population growth and/or inaccurate growth projections resulting in a surge of vehicles and a misuse of the road network (e.g. trucks on non-truck routes) delaying public works from responding to urgent situations and lowering road surface life expectancies
- Access to a neighborhood cut off due to flooding when a key road becomes no longer passable
- Loss of grant funding with insufficient reserves, resulting in delayed projects
- Council pressure to the override capital program resulting in a diversion of resources (funding and staff) and an inability to complete planned work, thereby increasing the risk to the community
- Increased maintenance as a result of winter weather change due to climate change, including melting, snowing and freezing
- Loss of multiple staff at once reducing the ability to maintain the exiting road network and causing interruptions to capital program implementation

Financing Strategy

Operating expenditures for the road network over the last 5 years have been on average approximately $6.5 million annually, with a notable decline in spending annually. In particular, contracted services has decreased significantly. Historical capital renewal for roads has fluctuated around the $1.8 million range, and makes up almost half of the City's capital spending on core assets. There has been fairly consistent spending annually on City-funded growth and enhancement.

Forecasted operating expenditure is $6.5 million annually, with an additional $2.2 million designated for capital renewal of roads, based on current levels of service. Budgeted growth and enhancement for transportation works (including roads, bridges and culverts, and stormwater) is projected to cost an average of $1.5 million annually.

Paved roads appear to have the largest infrastructure gap. They are a concern and a priority for the community and at current levels of expenditure the overall condition of the road network is likely to continue to decline, necessitating a reduction in the level of service being provided unless significant budget increases are applied. A road model was developed to assist the City in prioritizing road renewal projects while maximizing available funds. The model currently uses 2011 condition data, which can be updated by the City once the condition assessments being undertaken this summer are complete. The results can inform new long term capital plan.

Furthermore, the gravel roads are underfunded. In alignment with the Gravel Roads Strategy, an increase in operations funding is required as the transition is made from significant annual capital investments to the new operational approach. It is recommended that the City explore additional funding for the road network.

BRIDGES AND CULVERTS

The City's bridges were designed to carry all types of traffic, including heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians and cyclists.

State of Local Infrastructure

There are 11 bridges,15 large culverts and 409 other culverts with a replacement value of $50.3 M. Structures have an average age of 27 years compared to a life expectancy of between 40 and 60 years. Structures are generally in good condition, meaning they are adequate for now, with an average weighted Bridge Condition Index (BCI) of 72 for bridges and 89 for large culverts.

Levels of Service

The current LoS for bridges and culverts is presented in the table below, centred on providing adequate capacity for all modes of transportation, keeping bridges and culverts in good working condition, and ensuring bridges are safe to use. There are size restrictions on 2 bridges: Du Lac Bridge and Indian Creek Bridge.

Recognizing that the condition of the City's structures generally falls within the good-very good range, minimal renewal investments are expected for rehabilitation within the 10 year scope of this AMP. However, proactive planning with an emphasis on continued maintenance will be important to address any identified needs and to prolong the service life of these bridges and culverts.

Community LoS	Technical LoS	Performance		
Bridge capacity is adequate for all modes of transportation	% of bridges with loading or dimensional restrictions	18%		
		2021	2020	2019
Bridges are kept in good working condition	Bridges: average bridge condition index value[1]	72	-	70
Bridge culverts are kept in good working condition	Structural culverts: the average bridge condition index value[2]	83	-	62
Bridges are safe to use	Bridges are routinely inspected to provincial standards (MMS)	100%	-	100%

[1] *Reports completed every other year so there was no report in 2020*

[2] *Condition is weighted based on replacement value*

Asset Management Strategy

Growth

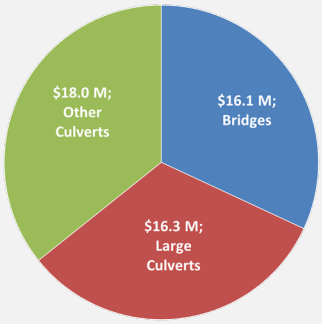
The MMTMP does not indicate any specific bridge or culvert projects related to growth.

11
BRIDGES

15
LARGE CULVERTS

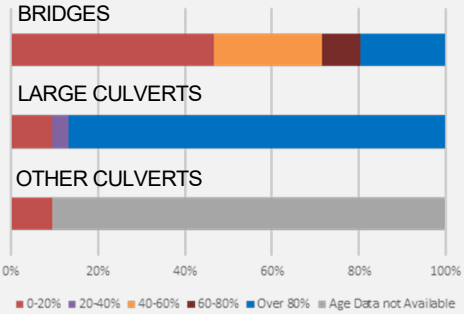
409
OTHER CULVERTS

$50.3 M
BRIDGE AND CULVERT INFRASTRUCTURE

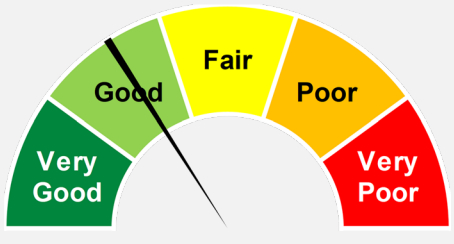


VALUATION

27 YEARS
AVERAGE AGE



LIFE CONSUMED



CONDITION

Lifecycle Activities

A summary of bridge and culvert lifecycle activities is presented in the table below.

Maintenance & Operations	Renewal
• Contracted out with the exception of deck washing and minor erosion work • Detailed visual inspection (biennial) and reporting of structures in accordance with OSIM • Annual bridge maintenance program is tailored to each bridge and implemented • Major works are pooled together and contracted out every 5 years	• OSIM report identifies need for a detailed survey of a structure • Detailed survey conducted – inspection and possibly spot repairs (contracted out) • Cost benefit analysis (repair or replacement) • Design, tendering and construction contracted out
Disposal	**Non-Infrastructure Solutions**
• Generally requires the removal and reconstruction of complete bridge and culvert assets • Granular material is recycled • Abutment walls reused when possible • Narrow window for water works, and permitting is required	• Bridge size/dimension restrictions

Ontario Structure Inspection Manual (OSIM) inspections are undertaken every 2 years to assess bridge and culvert condition, which includes a detailed visual inspection and reporting. Where required by the OSIM report, a more detailed survey/inspection of a structure will be undertaken.

Risks

Potential risks to maintaining the current level of service for bridges and culverts include:

- Flooding due to climate change resulting in culvert damage
- Loss of grant funding with insufficient reserves, resulting in delayed projects
- An increase in material costs such as fuel, resulting in a decrease in the overall amount of work that can be completed within exiting budgets
- Council pressure to the override capital program resulting in a diversion of resources (funding and staff) and an inability to complete planned work, thereby increasing the risk to the community
- Community group advocacy resulting in the need to change the design of existing bridges or permanently close them due to lack of budget for required/desired improvements, requiring users to divert their routes
- Erosion and intensity of water as a result extreme rainfall due to climate change, affecting the safety and stability of structures and ultimately increasing risk to stakeholders
- Lack of funding for active transportation projects which puts stress on the renewal budget

Financing Strategy

Operating expenditures for structures (bridges and culverts) over the last 5 years have been on average approximately $400 thousand in spending annually. Historical capital renewal for bridges and culverts has fluctuated around an annual average of $1.0 million. There has been no spending on City-funded growth and enhancement of structures over the last 5 years.

Forecasted bridge and culvert operations is an average of $401 thousand annually, with an additional $76 thousand and $449 thousand designated for capital renewal of bridges and culverts respectively. Budgeted growth and enhancement for transportation works (including roads, bridges and culverts, and stormwater) is projected to cost an average of $1.5 million annually, however there are no projects specifically earmarked for bridges and culverts.

Structures appear to have no infrastructure gap.

WATER

The water system services approximately 10,000 residents and businesses in Rockland and the other five Hamlets. In addition to providing drinking water to these customers, in 2020 the City signed a joint water use agreement with The Nation Municipality and will begin providing 350 m^3 of water per day to them this spring in order to supplement their water supply.

The Ontario Clean Water Agency (OCWA) operates and maintains this water infrastructure and is responsible for measures in place to ensure the quality and safety of the City's drinking water.

State of Local Infrastructure

There are 141 km of water pipes, 1 water treatment facility, 3 water storage facilities, 1 booster station and 1 low lift (river water) pumping station, with a combined replacement value of $99.5 M. Water pipes make up 75% of this value. The water system has an average age of 20 years compared to an average life expectancy of 50 years.

Water facilities are generally in very good condition. Although no information is available on the condition of the water pipes, most of the cast iron pipes in the service area have been renewed (approximately 10% remaining) since their original installation in the 1960s/70s.

Levels of Service

The current LoS for water is presented in the table below, centred on the accessibility of infrastructure for servicing lots, access to fire flow, meeting regulatory requirements, the reasonableness of time taken to restore service, and efficient design and operation.

Community LoS	Technical LoS	Performance		
Water distribution infrastructure is accessible for servicing lots within the water service area	% of properties connected to the municipal water system	58%		
All connected properties have access to fire flow	% of properties where fire flow is available	58%		
		2021	2020	2019
Water services meet regulatory requirements	# of non-compliance events	2	5	1
Time taken to restore water services is reasonable	# of connection-days / year where a boil water advisory notice compared to the total # of properties connected[1]	0.01%	0%	0.04%
Water service is designed and operates effectively	# of connection-days / year due to water main breaks compared to the total # of properties connected[1]	0.03%	0.04%	0.07%

[1] *7,159 connected properties*

141 KM WATER PIPES

1 WATER TREATMENT PLANT

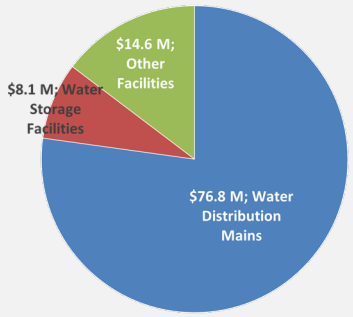
3 WATER STORAGE FACILITIES

1 BOOSTER STATION

1 LOW LIFT PUMPING STATION

$99.5 M

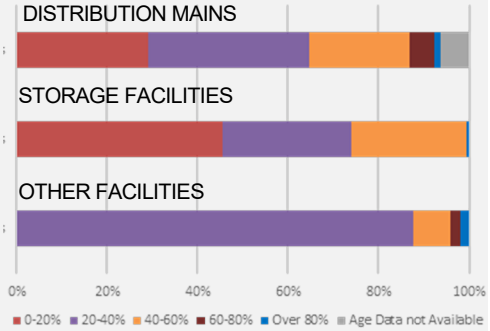
WATER INFRASTRUCTURE



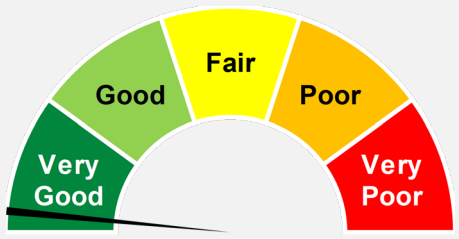
VALUATION

20 YEARS

AVERAGE AGE

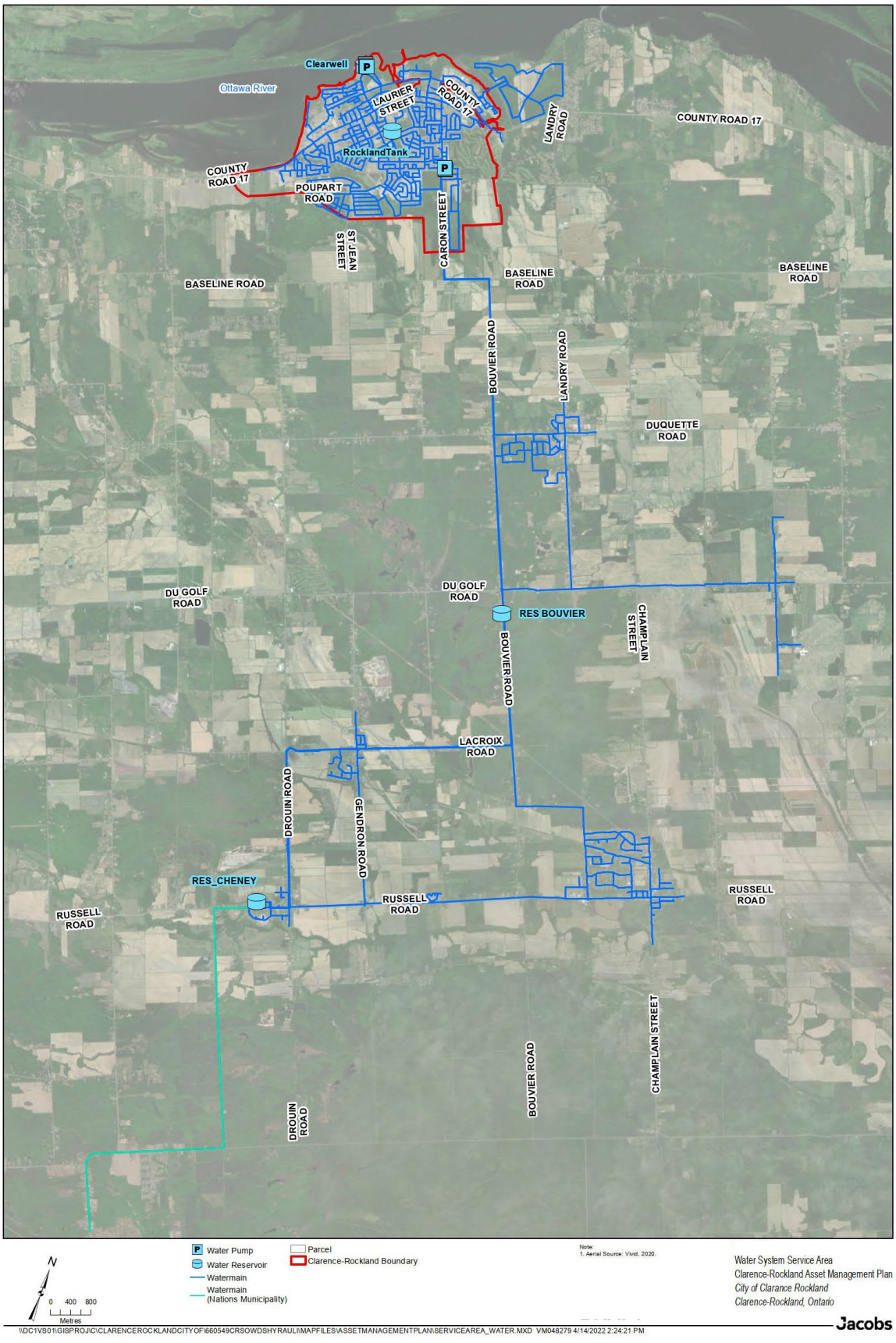


LIFE CONSUMED



CONDITION OF FACILITIES

The service area, including The Nation's extension to the Village of Limoges, is shown below. All connected properties have access to fire flow.



Staff feel that the water system is very reliable with optimal treatment. There have been only precautionary boil water advisories issued in 2019 and 2021 due to watermain replacement projects. Over the last few years there have been 2-5 watermain breaks and service repairs per year. The City has taken steps to improve the water LoS, including significantly lowering leakage over the last 5 years by replacing problematic watermains. Issues with freezing pipes were resolved in 2021 by replacing affected pipes. All properties are metered and water restrictions are put into effect each summer to encourage moderated use during peak demands. While operating on average under half the rated capacity, summer peak demands necessitate higher flows to meet fire capacity. Although all connected properties have fire flow, there are several that may not have sufficient fire flow for adequate protection.

Asset Management Strategy

Growth

The Development Charge Program identifies $16.8 million in growth-related water projects which will be substantially funded through DCs. Of these, approximately 30% are complete. The City's new Water Master Plan, once available, will provide additional direction regarding infrastructure needs in response to growth.

Lifecycle Activities

A summary of water lifecycle activities is presented in the table below.

Maintenance & Operations (undertaken by OCWA)	Renewal
• Maximo used to track work orders • Preventative maintenance is primarily based on manufacturer's and/or industry standards • Visual inspections on facilities conducted regularly • Corrective work is undertaken based on a classified and prioritized list • Water main breaks recorded • Annual flushing of the whole system • Valves, cleanouts and hydrants are inspected annually alongside flushing program • Hydrants more thoroughly inspected every 5 years • Valves inspected every 5 years • Water master planning (every 5 years) • Energy audits undertaken sporadically • Major repairs and inspections are contracted out • City staff responsible for building envelope maintenance	• Undertaken by City staff or contracted out • Capital works are tracked manually using a spreadsheet with progress updated monthly • Facilities evaluated based on condition and/or a cost benefit analysis of maintenance v. replacement • Pipes evaluated based on break history and/or a cost benefit analysis of maintenance v. replacement • Floating list of problematic areas reviewed with City annually • Budget submitted and considered from a multi-utility perspective • Replacement of facilities, and relining or replacement of pipes occurs
Disposal	**Non-Infrastructure Solutions**
• Assets are retired and new assets are put in place with new tags • Like for like replacement isn't recorded in the financial system • Facilities and their components are sent to metal or mortar disposal • Pipes are sent to the landfill or for metal recycling • Metal recycling is brought to Ottawa for ticketing, disposal and reimbursement	• Water conservation program (metering, outdoor water use restrictions, low flow appliances) • Flow monitoring plan • Fire protection plan

Condition of facilities is assessed regularly through visual inspections. Valves, cleanouts and hydrants are inspected annually alongside the flushing program. More detailed inspections are undertaken on hydrants and valves every 5 years.

Risks

Potential risks to maintaining the current level of service for the water system include:

- An increase in material costs such as fuel, access to required parts as a result of supply chain limitations, resulting in a decrease in the overall amount of work that can be completed within exiting budgets
- Minimal risk of being able to access staff labour when required
- Pending regulatory changes resulting in potential cost increase as a result of redundancy requirements necessitating significant distribution and treatment infrastructure investments

- Inaccurate growth projections particularly with the demand that The Nations Municipality were expecting to have on the system, resulting in capacity issues with water system
- Water quality issues as a result of increased precipitation due to climate change

Financing Strategy

Operating expenditures for the water system over the last 5 years have been on average approximately $2.7 million in spending annually, including services contracted to OCWA. Capital renewal for water has been an average of $801 thousand annually. There was $660 thousand spent on City-funded water growth and enhancement in 2019.

Forecasted water operations is $2.7 million annually, with an additional $386 thousand designated for capital renewal. An average of $150 thousand annually has been identified to address the budgeted growth and enhancement projects. Water utility rates are used to fund the water system, at a projected level of $3.2 million annually, with approximately $700 thousand available for capital expenditures. Reserves and debt are used for capital and growth-related work where necessary. There are minimal grants available, and these are generally targeted to very specific studies or capital projects.

For water it is not possible to comment on the infrastructure gap until costs are available in the Water Master Plan currently underway.

WASTEWATER

The City's wastewater system consists of collection pipes, sewage pumping stations (SPS) and the Rockland Water Pollution Control Plant (WPCP), all of which are operated and maintained by the OCWA. A ninth SPS is being designed and a tenth is anticipated. A new headworks facility is also under construction. The wastewater system services approximately 44% of properties in the City, all within the boundaries of the former Town of Rockland. Expansion to the Hamlets (serviced by septic) has been considered but set aside by Council as it could affect the ability to deliver services at current levels.

State of Local Infrastructure

There are 50 km of wastewater collection pipes, 4 km of trunkmains, 5 km of forcemains, 1 treatment plant and 8 SPS with a combined replacement value of $71.5 M. The wastewater system has an average age of 30 years (excluding trunk mains which are a data gap) compared to an average life expectancy of 50 years. The system is in poor condition, with collection pipes and trunk mains mostly in very poor condition. Very little condition data is available for forcemains.

Levels of Service

The current LoS for wastewater is presented in the table below, centred on the accessibility of infrastructure for servicing lots, a reliable system, safe collection and treatment, meeting regulatory requirements, efficient design and operation, and the reasonableness of time taken to restore service.

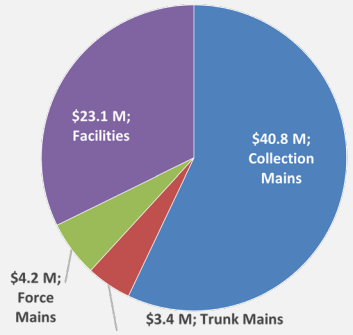
Community LoS	Technical LoS[1]	Performance		
Collection infrastructure is accessible for servicing lots within the sewer service area	% of properties connected to the wastewater system	44%		
		2021	2020	2019
Service is reliable	# of events / year where combined sewer flow in the system exceeds capacity compared to the total # of properties[4]	0%	0%	0.04%
Service safely collects and treats wastewater	# of connection-days / year due to wastewater backups compared to the total # of properties[2]	0.04%	0.02%	0.02%
Service meets regulatory requirements	# of effluent violations / year due to wastewater discharge compared to the total # of properties[2]	0%	0.2%	0%
Service is designed and operates effectively	Blocked sewers per Km/Year	3.4%	3.4%	3.4%
Time taken to restore service is reasonable	% of service interruptions restored within 12 hrs	100%	100%	100%

[1] *5,261 connected properties*

[2] *Compared to the total # of properties connected to the wastewater system*

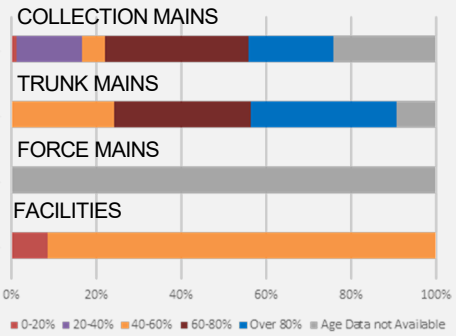
50 KM COLLECTOR PIPES
4 KM TRUNKMAINS
5 KM FORCEMAINS
1 WASTEWATER TREATMENT PLANT
8 SEWAGE PUMPING STATIONS

$71.5 M
WATER INFRASTRUCTURE

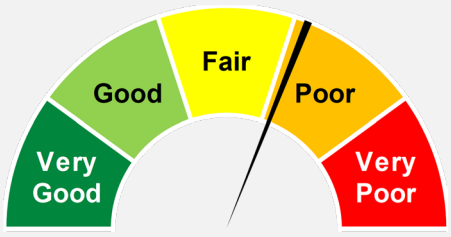


VALUATION

30 YEARS
AVERAGE AGE



LIFE CONSUMED



CONDITION

The current wastewater service area is illustrated below.

The Rockland WPCP is currently operating at 60-70% of its rated capacity. Based on current growth projections and assumptions, it is anticipated that the average day flow will exceed the current rated capacity of the WPCP by approximately year 2032.

The City is actively working on improving resilience of the wastewater system, as past flooding has temporarily impeded the City's ability to provide service.

Asset Management Strategy

Growth

The Development Charge Program identified $39 million in growth-related wastewater projects, to be substantially funded through DCs. Over half of this work has been completed, with some currently underway (eg. the WPCP headworks upgrade and the SPS #1 expansion, as well as the new design of SPS #9). The City's new Wastewater Master Plan, once complete, will provide additional direction regarding infrastructure needs in response to growth.

Lifecycle Activities

A summary of wastewater lifecycle activities is presented in the table on the next page.

Maintenance & Operations (undertaken by OCWA)	Renewal
• Maximo used to track work orders • Risk-based preventative maintenance framework used based primarily on manufacturer's and/or industry standards • Annual pipe flushing by zone on a 3 year cycle • Flushing of trouble spots undertaken quarterly • Condition assessments on facilities and pipes are undertaken every 5 years, with the intention of using the information for the master planning process • Wastewater master planning (every 5 years) • City staff responsible for building envelope maintenance	• Undertaken by City staff or contracted out • Capital works are tracked manually using a spreadsheet with progress updated monthly • Facilities and pipes evaluated based on of condition and/or a cost benefit analysis of maintenance v. replacement • Floating list of problematic areas reviewed with City annually • Budget submitted and considered from a multi-utility perspective • Replacement of facilities, and relining or replacement of pipes occurs
Disposal	**Non-Infrastructure Solutions**
• Assets are retired and new assets are put in place with new tags • Like for like replacement isn't recorded in the financial system • Facilities and their components are sent to metal or mortar disposal • Pipes are sent to the landfill • Metal recycling is brought to Ottawa for ticketing, disposal and to enable reimbursement	• I&I studies • Education and awareness program (fats, oil and grease, think before you flush, wipes in your pipes and hazardous waste) • MECP regulatory requirements

Condition of facilities and pipes are assessed every 5 years, with the intention of using the information to inform the master planning process.

Risks

Potential risks to maintaining the current level of service for the wastewater system include:

- Pending MECP changes resulting in potential cost increase as a result of redundancy requirements necessitating significant distribution and treatment infrastructure investments
- Inaccurate growth projections resulting in capacity issues with the wastewater system
- Major overflow at the wastewater treatment plant resulting in environmental impacts and a breach in regulations
- Recurrence of minor overflow at a pumping station resulting in environmental impacts and a breach in regulations
- An increase in material costs such as fuel, resulting in a decrease in the overall amount of work that can be completed within exiting budgets
- Increased precipitation due to climate change resulting in higher chance of large flood situations
- Minimal risk of being able to access staff labour when required

Financing Strategy

Operating expenditures for the wastewater system over the last 5 years have been on average approximately $1.8 million annually, including services contracted to OCWA. Capital renewal has been minimal, with an average of $50 thousand spent annually. There has been no City-funded spending on wastewater growth or enhancement.

Forecasted wastewater operations is $1.8 million annually, with an additional $902 thousand designated for capital renewal. An average of $770 thousand annually has been identified to address the budgeted growth and enhancement projects. Wastewater utility rates are used to fund the water system, at a projected level of $2.7 million annually, with approximately $150 thousand available for capital expenditures. Reserves and debt are used for capital and growth-related work where necessary. There are minimal grants available, and these are generally targeted to very specific studies or capital projects.

Wastewater appears to have small infrastructure renewal gap and the MECP requirement to increase equipment redundancy does not appear to have funding allocated.

STORMWATER

The urban area of the City is serviced by a municipal stormwater system designed according to dual drainage principles. It includes a dedicated minor system (inlet, storm sewers and minor swales) to capture frequent flows, as well as a major system (roadway network, ditches, and overland relief routes) to convey larger and less frequent events and direct flows towards tributaries of the Ottawa River. The rural areas of the City are serviced by a network of roadside ditches and culverts that also ultimately drain to the Ottawa River. The stormwater system includes numerous stormwater management facilities designed to reduce peak flows and improve water quality before discharging into the River.

State of Local Infrastructure

There are 70 km of stormwater pipes, 1,363 catch basins, approximately 400 km of roadside ditches, and 27 municipal drains. The City also owns and operates a series of stormwater management ponds and outlets. The replacement value of stormwater pipes and catch basins is $63.5 M. The average age of stormwater assets is generally unknown as this asset category age data has major gaps.

The stormwater pipes are generally in very poor condition. Minimal condition information is available for catch basins and condition data is not available for other stormwater assets.

Levels of Service

While current stormwater performance is unavailable according to the technical LoS described in the table below, modelling has been undertaken to characterize the system in terms of % of pipe capacity full, under various design storm events. Maps on the next page illustrate modelling of existing conditions for 100 and 5-Year events.

Stakeholders have a 50% level of satisfaction with the stormwater system / flood protection[4]. The City is working to implement recommended improvements to the existing system, based on the City's first Stormwater Master Plan completed in 2019.

Community LoS	Technical LoS	Performance
Protect properties and roadways from significant flooding	% of properties in municipality resilient to a 100-year storm	n/a
	% of the municipal stormwater management system resilient to a 5-year storm	n/a

The map on the next page illustrates an estimated depth of flooding expected along the major overland system (roadway, ditches and rear yard swales) under a 100 year event. In general, depths above 0.4m can be considered an indication of flood potential that could potentially impact nearby properties.

[4] Strategic Plan (2015-2021) consultation

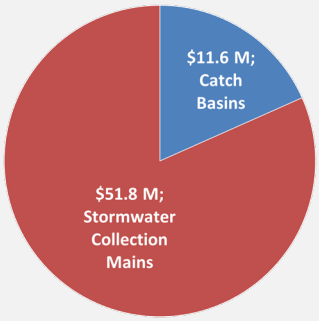
70 KM
STORMWATER PIPES

400 KM
ROADSIDE DITCHES

1,636
CATCH BASINS

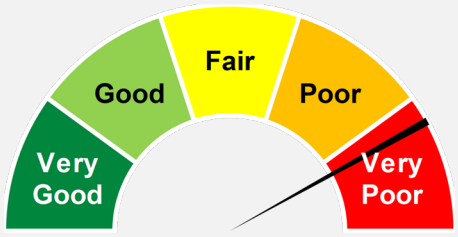
27
MUNICIPAL DRAINS

$63.5 M
STORMWATER INFRASTRUCTURE

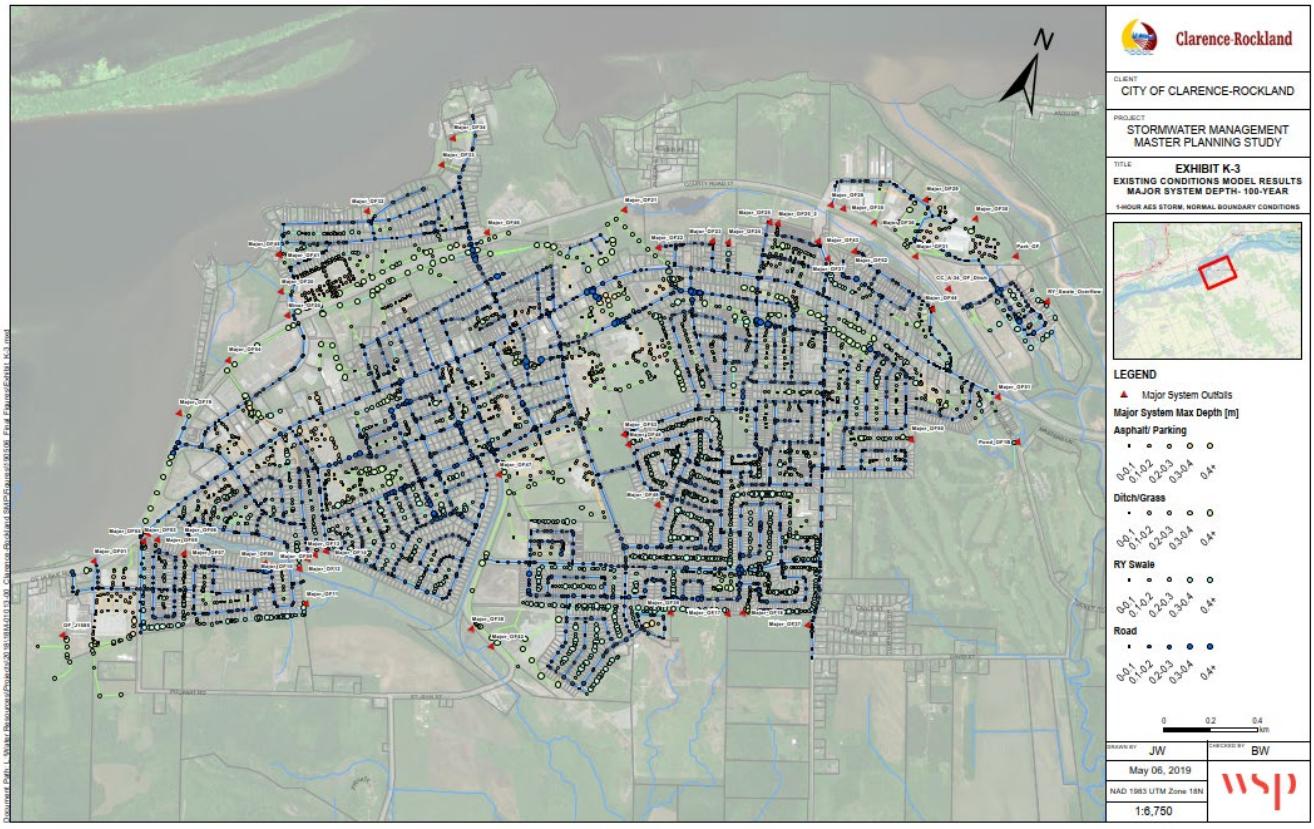


VALUATION

UNAVAILABLE
AVERAGE AGE / LIFE CONSUMED

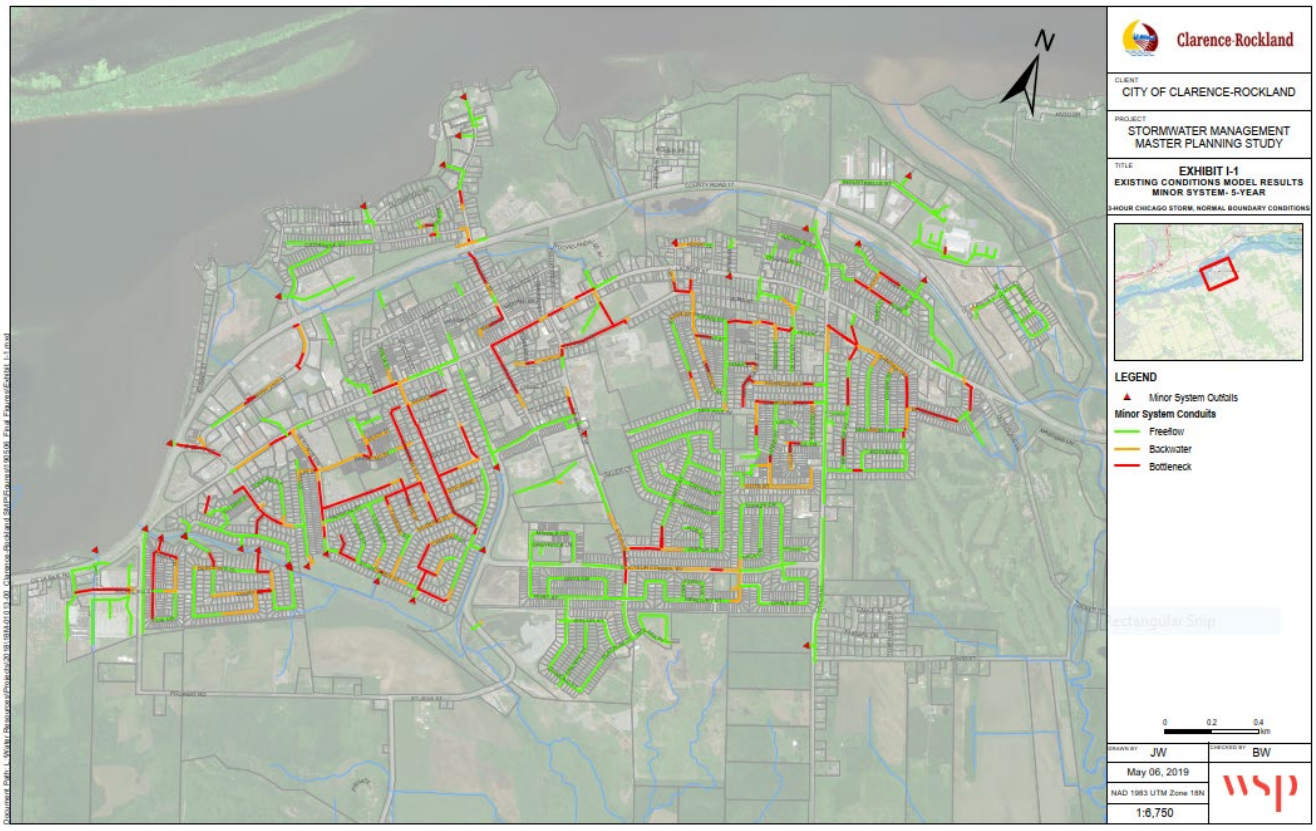


CONDITION OF PIPES



Source: Stormwater Master Plan (2019)

The map below illustrates the percent of the municipal system that may be resilient to a 5 year storm.



Source: Stormwater Master Plan (2019)

Clarence-Rockland Asset Management Plan (2022)

For the 5 year design event according to modelling, 63% of the urban municipal storm sewers are predicted to be operating at 80% full pipe capacity or less. However, it is understood that for storm sewers operating above 80% full pipe capacity (or even above 100% full pipe capacity), this does not necessarily indicate flooding is expected. There are creeks in the City that have noted capacity constraints, for instance Bearbrook Creek has been understood to exceed its capacity under the 5-year event. Sewers discharging to Lafontaine Creek have also been identified as susceptible to significant backflow conditions from the Creek during the 100-year event.

The City is adjacent the Ottawa River and its land area and stormwater system are both susceptible to the impact of high riverine conditions. Clarence Rockland is positioned at the downstream end of the very large (146,300 km^2) Ottawa River basin and is particularly vulnerable to hydrologically significant events that occur. In 2017 and 2019, the Ottawa River experienced significant and historical elevations driven by high rate of snowmelt exacerbated by extended periods of intense rainfall across the basin, which caused the Ottawa River to crest its banks at Clarence Rockland. Significant flood damage resulted, and a state of emergency was instituted in both years.

Asset Management Strategy

Growth

The Stormwater Master Plan provides recommends upgrades phased over 15 years for improving the hydraulic performance of the sewer network as well as future planned growth areas and the associated stormwater infrastructure that will be required. The impacts of climate change were also considered. The Stormwater Master Plan also identifies four future stormwater facilities that will be required to manage stormwater runoff generated by future growth areas. Design and construction of the stormwater facilities will be the responsibility of the developers, and the facilities will be turned over to the City after a designated maintenance period. There are other future development areas that are not large enough to warrant a new stormwater facility to meet design criteria, so instead runoff will be managed by lot-level stormwater controls for these sites, which will be delivered by the developer as part of their site plan works.

Lifecycle Activities

A summary of stormwater lifecycle activities is presented in the table below.

Maintenance & Operations	Renewal

• Undertaken by City staff or contracted out
• Maintenance monitoring program in place for storm ponds
  – MECP reporting every 3 years
  – Check pond elevations and sediment every 5 years
• Annual maintenance, flushing, cleaning and MECP reporting of stormceptors
• Annual corrective maintenance on municipal drains (contracted out)
• Stormwater master planning (will be undertaken every 5 years in future)
	• Stormwater facilities are generally new
	• Relining and patching of pipes used to extend life of assets
	• Undertaken by City staff or contracted out

Disposal	**Non-Infrastructure Solutions**
• No programs in place	• I&I reduction program • Community flood awareness • Established stormwater design criteria to control quantity and quality of post-development runoff.

Condition is evaluated informally as part of the annual maintenance, flushing, cleaning and MECP reporting of tormentors. Pond elevations and sediment are checked every 5 years.

Risks

Potential risks to maintaining the current level of service for the stormwater system include:

- Increased precipitation due to climate change resulting in: river overtopping and as a result flooding of basements in homes within approximately 50m of the watercourse; and, more frequent ponding in newer areas of the City with insufficient stormwater management facilities and/or capacity

- Population growth and/or inaccurate growth projections resulting in: capacity issues with the stormwater system, affecting ability to mitigate effects if water can't be collected, directed, and treated effectively; and, a need for additional stormwater management facilities, putting additional stress on staff and on budgets
- Loss of grant funding with insufficient reserves, resulting in delayed projects
- Stormwater is a newer focus area for the City, so there is more uncertainty about future stormwater system needs
- Pending MECP changes resulting in potential cost increase as a result of redundancy requirements necessitating significant infrastructure investments

Financing Strategy

Operating expenditures for the stormwater system over the last 5 years have been on average approximately $1.1 million annually, with a notable decline in spending annually. Historical capital renewal has fluctuated, with an average of $349 thousand annually. There has been very minimal spending on City-funded growth and enhancement.

Forecasted stormwater operations is $891 thousand annually, with an additional $134 thousand designated for capital renewal. There is no budget for growth and enhancement projects, however the Stormwater Master Plan recommends $24 million in improvements based on conceptual level cost estimates, for work across "Flood Damage Centres" throughout the City.

The MECP requirement to increase redundancy of equipment does not appear to have funding allocated and this appears to be an infrastructure gap. Furthermore, the recommendations arising from the stormwater master plan (excluding new stormwater facilities provided by developers) do not appear to have funding allocated.

Improvement and Monitoring Plan

This AMP provides an overview of the City's core assets, meets the requirements of O. Reg 588/17, and sets up areas for improvement. Actions that the City can take towards the subsequent (2025) O. Reg 588/17 requirements for an AMP update, which will require a higher degree of practice maturity, are below.

Asset management improvements with respect to the **state of local infrastructure** include:

- **Updating the master asset inventory** to encompass outcomes from recent capital projects, condition assessments and other studies in addition to establishing a simple business process and clear responsibilities for updating the master asset inventory annually. As a longer-term endeavour, the City can work towards closing significant existing data gaps.
- **Updating replacement costs** for core assets prioritizing those assets with the highest total value (i.e. roads, water facilities, and water mains)
- **Designing an affordable condition assessment program for each asset type** with recurring timelines, building on the assessment work the City already has for bridges, wastewater mains and sidewalks.

Asset management improvement with respect to **levels of service** include:

- **Aligning community consultation with the City's LoS** as part of the next Strategic Plan, while continuing to gather insight on the importance and the level of satisfaction in City services.
- **Reviewing and refine LoS** in line with the new Strategic Plan and in particular consider filling the technical metrics for stormwater. Establish LoS targets for the next version of the AMP.
- **Conducting a simple Climate Change Study**, assessing the impact that future climate conditions could have on core assets and the City's ability to continue delivering services into the future.

Asset management improvement with respect to **asset strategies** include:

- **Updating growth projects and related capital projects** with the latest Water and Wastewater Master Plans once complete.
- **Addressing new MECP requirements** through a simple study to understand the impact including changes to current practices and cost of implementation.
- **Review all waste disposal practices** to identify further opportunities for waste minimization (e.g. recycling asphalt to gravel roads).
- **Maintaining 10-year capital renewal plans**, beginning with a simple business process to maintain rolling 10-year capital renewal plans for the City's core assets.
- **Formalizing the gravel roads strategy** based on the modelling completed as part of this project, including estimates of the operational and capital costs, and gain formal approval from Council.
- **Establishing a longer-term, evidence based renewals program for stormwater management** that builds on the tremendous progress the City has made over the last couple of years in moving from a wholly reactive to a more planned approach to stormwater.
- **Updating the paved roads model** with new inspection data from 2022, including updating the deterioration curves.
- **Creating renewals models for other core assets** based off the new paved roads model.

Asset management improvement with respect to **financial strategies** include:

- **Categorizing capital expenditures** between different asset classes (particularly transportation) and between growth and renewals, including both budgets and account codes that better categorize and enable the tracking of capital expenditures.
- **Additional funding for roads should be explored**, with options presented to Council, through an asset and financial study that can address the large infrastructure gap for the roads network and prevent the overall condition from continuing to decline at current levels of expenditure.