Town of Pelham

Asset Management Plan 2021

DECEMBER 20, 2021

Table of Contents

Introduction

The Town of Pelham (Town) is centrally located within the region of Niagara. One of 12 local area municipalities, the Town has a diverse range of assets and infrastructure. Within the municipal boundary, both rural and urban landscapes are combined and serve a growing population of 17 000. To support the residents of the five area communities within Pelham, municipal infrastructure includes a network of roadways, and includes underground infrastructure consisting of storm sewers, water mains, and sanitary sewers etc.

To continue to effectively and efficiently plan for the future of Pelham, proper asset management practices are necessary. Managing Pelham's assets will allow Council and Town staff to make accurate and informed strategies regarding Pelham's infrastructure and budgeting decisions.

Asset management in Pelham can facilitate a coordinated approach. An example of this approach is demonstrated with construction work by potentially reducing the amount of times road work is performed in a given location; By pairing work for road infrastructure with work required for underground infrastructure such as water main replacement.

Understanding Asset Management

Asset management is an active municipal task that requires ongoing updating and attention. Throughout the life of an asset, a municipality faces challenges which may include the following:

1. New technologies and techniques may impact the timing of repair, rehabilitation, and replacement strategies;
2. Resistance to increasing taxes to pay the cost for repair, rehabilitation, and replacement of infrastructure assets;
3. Responding to changing customer expectations and/or increased demands for services;
4. Changing regulatory requirements from senior levels of government.

Council Responsibility

Members of council play the critical leadership role in decision making for the levels of service provided within the municipality. Council impact on asset management is reflected in the policies adopted, annual asset reviews and with ongoing impacts to the assets based on service levels and demand. Town staff, provide support and recommendations to Council based on asset lifecycles and risk implications.

Reporting

The Town currently utilizes two different online software programs for managing asset information.

1. **Municipal Data Works (MDW):** a program which allows the user to manage their inventory as well as create and customize capital forecasts. Municipal Data Works has the ability to create a detailed 10-year forecast, with customization of parameters.
2. **Balance**: a program which is designed to track and manage financial aspects of asset management such as the replacement cost and lifecycle costs for assets.

The Town is proceeded toward an integrated workflow which involves using the data provided in Balance software in conjunction with the existing budget software, Questica, which is utilized for long-term capital planning and preparing the Capital Budget.

Requirements of O.Reg 588/17

Asset management plans, current levels of service

Appendix 1 details the Provincial Regulation outlining the requirements of that AMP and current levels of service, along with the required completion dates. The Town has completed the first requirement in 2019, completing the Strategic Asset Policy. This report will complete the second requirement due on July 1, 2022.

Scope

This document pertains to the Town of Pelham's core assets: roads, structures such as bridges and culverts, and underground infrastructure including the sanitary, storm water and water mains.

The core assets have been evaluated on the following criteria:

1. asset condition,
2. average age,
3. level of service and
4. replacement cost.

In the future, all of Pelham's assets will be evaluated and included in the asset management plan to comply with O. Reg. 588/17.

Asset Inventory

The asset inventory is used to maintain a record of the assets as well as their attributes such as the physical dimensions of the asset or the material. Maintaining an up-to-date inventory is essential to asset management. Costs involved with asset replacement and meeting levels of service rely on accurately accounting for the assets in question**.** Table 1 below shows a count or total length for the core asset inventories.

Table 1. Core Asset Inventory

Asset Category	Inventory	Unit
Roads	487	Lane km
Water mains	89	km
Sanitary Gravity Main	65	km
Sanitary Force Main	0.5	km
Storm Sewer Main	In progress	km
Bridges/Structural Culverts	23	Each

Asset Condition:

Asset condition is an indicator of the quality of the asset and plays a part in assessing the risk associated with the asset's function. For example, an asset left in poor condition possess a greater risk in comparison to a brand-new asset. Maintaining an up-to-date inventory as well as monitoring asset condition is integral to the process to managing risk and ensuring levels of service are met. This report uses multiple ways to assess asset condition and differs depending on the asset and the process involved with condition assessment.

Roads:
The Pavement condition index (PCI) was used to assign condition values to the road assets. In the first week of January 2020 a visual pavement condition survey was conducted to establish the PCI of each pavement section based on MTO SP-024 for asphalt concrete surface and MTO SP-021 for surface treated pavement.

The condition ranges for PCI are as follows:

100-76 Very Good
75-61 Good
60-51 Fair
50-0 Poor

Bridges and Culverts:
Bridges and structural culverts are inspected every 2 years in accordance with the Ontario structure inspection manual - O.Reg. 472/10, s. 2. requirements. Bridges and structural culverts are inspected in detail and assigned a condition value between 1 and 100. The explanation of the condition values is shown below in Table ***2.***

Table 2. Bridge condition index values.

Condition	BCI Range	Description
Very Good	80 – 100	Overall, the components of the structure are in very good condition. Generally, the structure has been constructed within the last 10 years and does not require any work within the next 10 years.
Good	70 – 79	Overall, the components of the structure are in good condition. Generally, the structure is adequate or requires only minor maintenance within the next 10 years.
Fair	60 – 69	Overall, the components of the structure are in fair condition. Generally, the structure requires major rehab or replacement within the next 10 years, or requires Deck Condition Surveys (DCS), Load Capacity Evaluation (LCE) or Rehabilitation/Replacement Analysis (RRA).
Poor	0 – 59	Overall, the components of the structure are in poor condition. Generally, the structure requires replacement within the next 5 years.

Sanitary Sewer, Storm Sewer, and Water mains:

The condition of the sanitary, storm water, and water main assets has been estimated using the age of the asset with respect to the expected useful life of the asset. The Public Works department was consulted to provide value for asset life expectancy according to the asset material. Asset age has been divided into 4 categories with respect to the life expectancy of the asset.

The categories are as follows:

very good <= 75% of life expectancy,
good <= 50% of life expectancy,
fair <= 25% of life expectancy,
poor >25% of life expectancy.

Assigning condition values according to the age of the asset makes the assumption that the asset's age reflects the condition of the asset meaning an asset which is near the end of its life expectancy is also assumed to be in poor condition, however this is not always the case. The Town of Pelham completes annual CCTV inspections of the sanitary system which will be used in the future to assign condition values to Pelham's sanitary infrastructure.

The Town of Pelham is in the process of working with a consultant to generate a condition rating system that will create a baseline system characterization analysis. This

will be used to identify deficiencies in the water and wastewater system and improve the capabilities of forecasting impacts to the town with respect to proposed developments.

Levels of service:

Level of service is a metric by which the quality of the service provided can be measured. The metrics for levels of service can be categorized in two groups: customer and technical.

1. Customer levels of service outline the overall quality, performance, availability and safety of the service being provided.
2. Technical levels of service outline the operating, maintenance, rehabilitation, renewal and upgrade activities expected to occur.

Level of service is a balance between user (customer) expectations for overall quality, performance, availability and safety of infrastructure assets with a cost that is affordable. Concurrent with the development/revision of customer levels of service, technical levels of service must be considered that also look at the risk associated with providing the service.

Asset management should reflect the priorities and expectations of the community. It is necessary to ensure that the services provided do in fact reflect the community's priorities and expectations. In compliance with O.Reg. 588/17 Section 5. Subsection 2 Part I requires that Pelham provide the current levels of service with respect to the core municipal assets in accordance with the technical metrics and qualitative descriptions as provided in the tables in the O.Reg. 588/17 document. In addition to the Town's level of service standards, there are minimum maintenance requirements that the Town must abide by.

Asset Replacement Cost:

The replacement cost of an asset refers to the cost required to replace the existing asset with a new asset. The values for determining asset replacement cost in this report have been sourced from our partner MARMAK who has evaluated the replacement costs from several municipalities to determine an accurate and realistic values. Table 3 below shows the replacement costs for the core assets.

Table 3. Core asset replacement cost

Asset Category	Replacement cost ($)
Roads	$103,894,000
Water mains	$28,233,286
Sanitary Sewer gravity mains	$37,218,768
Sanitary Sewer force mains	$274,525
Storm Sewer	*Pending completion of storm water main asset inventory*
Structures (Bridge/culverts)	$12,977,750

Average Asset Age:

The age of an asset is an important criterion to evaluate asset risk. Older assets are typically in poorer condition and therefore more likely to fail over time. The age of Pelham's assets was used to determine approximate condition levels for underground infrastructure such water mains which are difficult to inspect physically. The values for the average age of Pelham's core assets have been determined from engineering drawings which identify installation dates as well as from individual knowledge from the employees in the public works department who were called upon when sources were lacking. Table 4. Below shows the average asset age for the core assets.

Table 4. Core asset average age

Asset Category	Average Age (year)
Roads	15
Water mains	27
Sanitary gravity main	36
Sanitary Force Main	23
Storm Sewer Main	*Pending completion of storm water main asset inventory*
Bridges/Structural Culverts	48

Population Growth:

The Town of Pelham is expected to grow significantly in the next 2 decades. The estimates population count for mid-2038 is 24,000 people. Pelham's population as of the most recent census is approximately 17,000 people. To accommodate the growing population, new infrastructure including roads, sewer, housing etc. will be required. By effectively managing Pelham's assets, Pelham will be prepared to effectively plan for the future and efficiently manage its infrastructure.

Figure 1. Town of Pelham residential growth forecast summary

	Year	Population (Including Census Undercount)[1]	Excluding Census Undercount			Housing Units						Person Per Unit (PPU): Total Population/ Total Households
			Population	Institutional Population	Population Excluding Institutional Population	Singles & Semi-Detached	Multiple Dwellings[2]	Apartments[3]	Other	Total Households	Equivalent Institutional Households	
Historical	*Mid 2006*	16,580	16,155	140	16,015	5,100	305	510	15	5,930	127	2.724
	Mid 2011	17,030	16,598	368	16,230	5,322	474	395	16	6,207	335	2.674
	Mid 2016	17,550	17,110	440	16,670	5,475	430	550	15	6,470	400	2.645
Forecast	*Mid 2018*	18,560	18,089	467	17,622	5,775	484	569	15	6,843	425	2.643
	Mid 2028	22,080	21,521	536	20,985	6,827	801	735	15	8,379	487	2.568
	Mid 2038	24,670	24,049	620	23,429	7,530	1,044	903	15	9,492	564	2.534
	Buildout	27,600	26,900	693	26,207	8,327	1,345	1,112	15	10,799	630	2.491
Incremental	**Mid 2006 - Mid 2011**	**450**	**443**	**228**	**215**	**222**	**169**	**-115**	**1**	**277**	**208**	
	Mid 2011 - Mid 2016	**520**	**512**	**72**	**440**	**153**	**-44**	**155**	**-1**	**263**	**65**	
	Mid 2016 - Mid 2018	**1,010**	**979**	**27**	**952**	**300**	**54**	**19**	**0**	**373**	**25**	
	Mid 2018 - Mid 2028	**3,520**	**3,432**	**69**	**3,363**	**1,052**	**317**	**166**	**0**	**1,536**	**62**	
	Mid 2018 - Mid 2038	**6,110**	**5,960**	**153**	**5,807**	**1,755**	**560**	**334**	**0**	**2,649**	**139**	
	Mid 2018 - Buildout	**9,040**	**8,811**	**226**	**8,585**	**2,552**	**861**	**543**	**0**	**3,956**	**205**	

Transportation – Roads

Overview

Roads assets are an integral part of Pelham's infrastructure. Maintaining road infrastructure enables safe and efficient travel within the municipality. Otherwise, if road infrastructure is not well-maintained traffic halts can impede commuters and pot holes and other defects can result in unsafe conditions. In 2016 Pelham's Active Transportation Plan and Implementation Strategy, using data from the 2011 census, determined that at the time 95% of Pelham's residents are travelling by personal vehicle with 4% of those residents being passengers with the remainder of the population typically travelling by public transportation, walking and cycling. Recognizing the importance of efficient and safe roads to Pelham's residents, the Town is working hard to ensure that the levels of service required to meet the town's needs are met.

Pelham's roads can be categorized generally into 2 groups based on the material: high class bituminous (HBC) and low class bituminous (LBC). The majority of Pelham's roads, approximately 59% (144 km), are surfaced with low class bitumin and the remaining roads, approximately 41% (98 kms) is surfaced with High class bitumin.

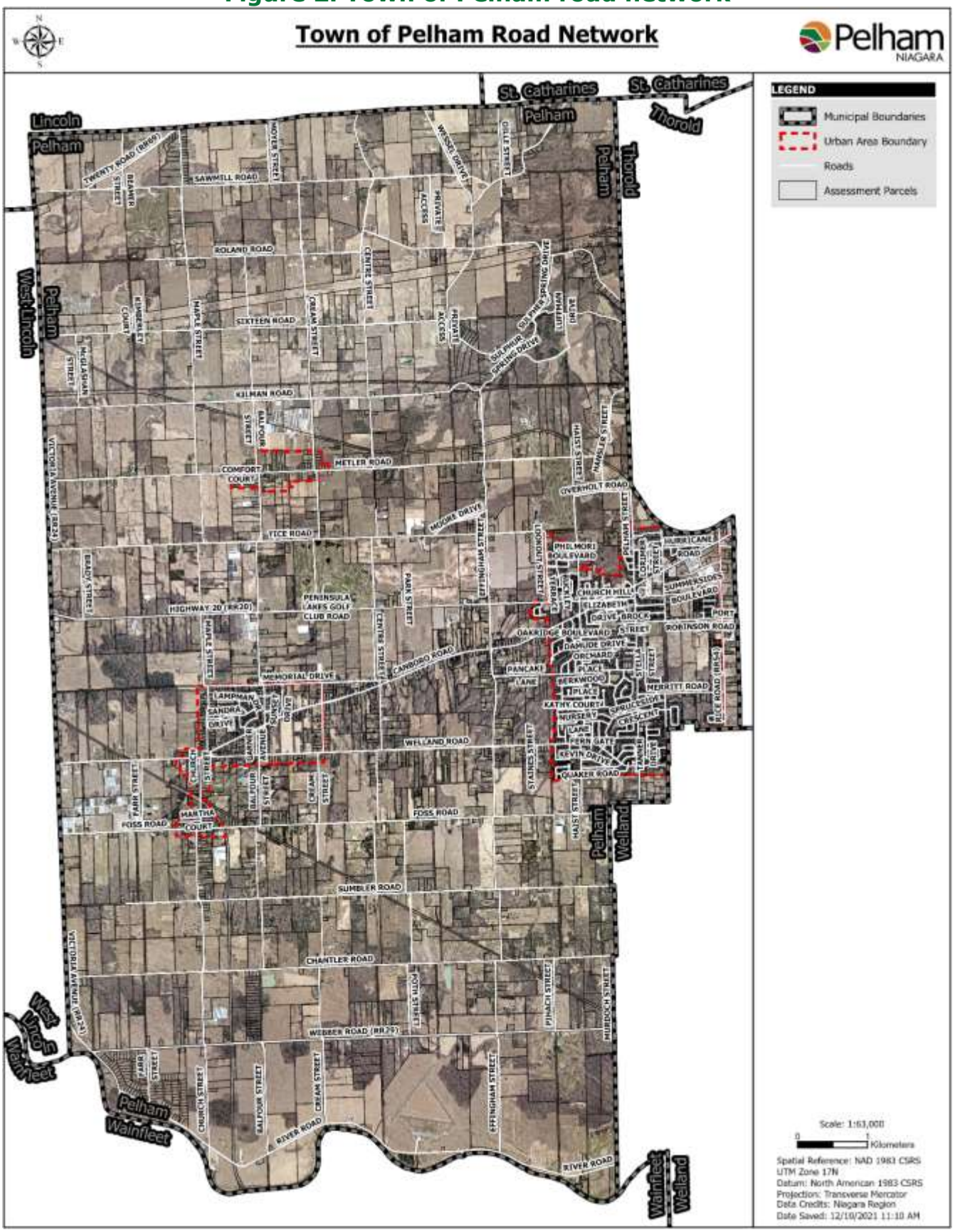
With respect to road classification, Pelham has 185 km of local roads, 55.2 km of collector roads, and 3.6 km of arterial roads totaling approximately 244 km or 488 lane kilometers.

Lane kilometers by road classification:

- **Arterial roads** (ex: Pelham St., Canboro Rd., HWY 20. etc.)
  7.22 lane-km:126 km2 land area
- **Collector roads** (ex: Haist St., Effingham Rd., Lookout St. etc.)
  110.36 lane-km:126 km2 land area
- **Local roads** (ex: Abbott Pl., Shoalts Dr., Bacon Ln. etc.)
  369.90 lane-km:126 km2 land area

Figure *2* below shows a map of Pelham's road infrastructure and symbolized by maintenance class. Road maintenance class is determined by the speed at which traffic is permitted to travel along the road and the average daily traffic supported by the road as shown in Figure *2* below.

Figure 2. Town of Pelham road network



Average Age

The average age of the road network is 15 years (age determined from latest construction year).

Condition

Pelham's road condition is based on the pavement condition index (PCI). The average road condition in Pelham is 69 and Pelham does not have any unpaved roads. The PCI for Pelham's roads is categorized into 4 condition levels: Very good, Good, Fair, and Poor. Below are examples of the different road classifications according to material.

The condition for Pelham's road assets are shown below:

Figure 3. Pelham's Road Asset Condition

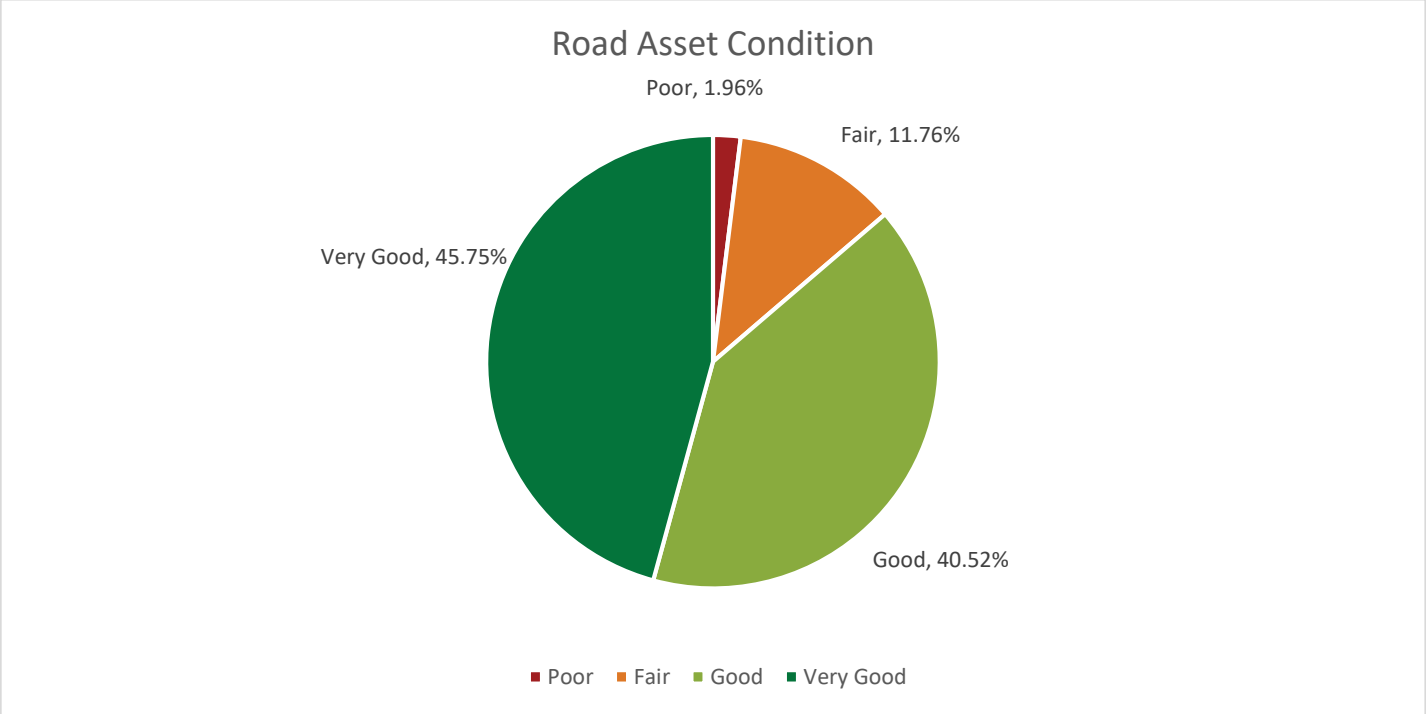


Figure 3 indicates that approximately 86% of Pelham's road assets are in good or very good condition and approximately 14% of Pelham's road assets are in fair or poor condition.

HCB road condition examples (Very good, Good, Fair, Poor):

Figure 4. Cherry Ridge Boulevard, from Steele Drive to Sandra Drive – HCB

(Very good condition, PCI = 97)

Figure 5. Station Street, from Hurricane Road to Cherrywood Avenue – HCB

(Good condition, PCI = 73)

Figure 6. Kevin Drive, from Haist Street to Sherri lee Crescent – HCB

(Fair condition, PCI = 55)

Figure 7. Spencer Lane, from Pinecrest Court to End – HCB

(Poor condition, PCI = 49)

LCB road condition examples (Very good, Good, Fair, Poor)

Figure 8. Maple Street, from Sixteen Road to Roland Road – LCB

(Very good condition, PCI = 88)

Figure 9. Tice Road, from Cream Street to Cream Street – LCB

(Good condition, PCI = 72)

Figure 10. Pancake Lane, from Haist Street to Shoalts Drive – LCB

(Fair condition, PCI = 60)

Figure 11. Balfour Street, from River Road to Webber Road (RR29) – LCB

(Poor condition, PCI = 47)

Current Performance of Road Assets According to Metrics Established by the Town of Pelham

See Table 20 in the Appendix.

Life Cycle Activities

Construction
A new road is installed with a fresh base and top coat of asphalt. After a period of 1 year, the town of Pelham takes over the responsibility of maintaining the road as well as the associated infrastructure such as the sewer and water mains and curbs etc.

Rehabilitation

- General Maintenance**:** typically involves surface repairs such as filling cracks and pot holes.
- Grind and Overlay: Removes a section of the road's surface and replaces it with a new surface coat of asphalt.
- Pulverize and Resurface – Single Lift: Used to extend the roads useful life by repairing the base and surface of the road.
- General Maintenance: After a road has been rehabilitated, general maintenance is continued until the road's condition deteriorates to a level at which it is longer fiscally responsible to continue with general maintenance.

Reconstruction:
The final stage of a roads life cycle is reconstruction, when the road has reached its lowest acceptable condition level and a new road is installed to replace the existing asset.

The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service

Option 1. Road Assets 10-year capital forecast with minimum costs to maintain existing levels of service shown in
Table 5 below:

Table 5. Option 1 - 2022 road assets 10-year capital forecast

Budget By Strategy	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Re-Construction	$11,092,028	$7,752,469	$16,474,654	$98,400						
Rehabilitation	$6,479,126	$1,718,564	$299,143	$1,050,123	$384,291		$160,475			$103,408
Total	$17,571,154	$9,471,033	$16,773,796	$1,148,523	$384,291		$160,475			$103,408
Average RLE	25.2	30	35	26.7	29.2		30.5			28

Option 2. Road Assets 10-year capital forecast adjusted to accommodate budget constraints, shown in Table 6 below:

Table 6. Option 2 - 2022 road assets 10-year capital forecast

Budget By Strategy	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Re-Construction	$1,858,178	$1,904,330	$1,775,939	$691,756	$656,834	$506,514		$16,679		
Rehabilitation	$4,327,674	$2,919,975	$2,781,554	$2,264,819	$2,398,303	$1,718,564				
Total	$6,185,852	$4,824,304	$4,557,493	$2,956,575	$3,055,136	$2,225,078		$16,679		
Average RLE	21.5	19.7	20.9	20.4	20.5	20.5		23		

Lifecycle activities that can be undertaken for the lowest cost to maintain the current levels of service

The options for life cycle activities that can be undertake for the lowest cost to maintain the levels of service are detailed below:

Option 1. The life cycle activities than can be undertaken for the lowest cost to maintain the current levels of service, shown in the following Table 7:

Table 7. Life Cycle Activity Cost - Option 1

HIGH CLASS BITUMINOUS ROADS				
PCI	**Life Cycle Activity**	**Life Expectancy Gain (year)**	**Cost ($)/m2**	**Units**
44	Re-construction	30	125	m^2
59	Maintenance	3	5	m^2
65	Pulverize and Resurface – Single Lift	18	50	m^2
69	Grind and Overlay	10	31	m^2
100	Maintenance	3	5	m^2
LOW CLASS BITUMINOUS ROADS				
PCI	**Life Cycle Activity**	**Life Expectancy Gain (year)**	**Cost ($)**	**Units**
44	Re-construction	30	18	m^2
59	Maintenance	3	4	m^2
65	Pulverize and Resurface – Single Lift	14	8	m^2
69	Single Surface Treatment	8	7	m^2
100	Maintenance	3	4	m^2

Option 2. Life cycle activities costs with adjusted condition levels to accommodate budget constraints, are shown in the following Table 8:

Table 8. Life Cycle Activity Cost - Option 2

HIGH CLASS BITUMINOUS ROADS				
PCI	**Life Cycle Activity**	**Life Expectancy Gain (year)**	**Cost ($)**	**Units**
35	Re-Construction	30	125	m^2
39	Maintenance	3	5	m^2
40	Pulverize and Resurface – Single Lift	18	50	m^2
50	Grind and Overlay	10	31	m^2
80	Maintenance	3	5	m^2
LOW CLASS BITUMINOUS ROADS				
PCI	**Life Cycle Activity**	**Life Expectancy Gain (year)**	**Cost ($)**	**Units**
35	Re-Construction	30	18	m^2
39	Maintenance	3	4	m^2
40	Pulverize and Resurface – Single Lift	14	8	m^2
50	Single Surface Treatment	8	7	m^2
80	Maintenance	3	4	m^2

Risks Associated with Options for Undertaking Life Cycle Activities:

Option 1: Option 1 would allow for the current levels of service to be maintained. The town of Pelham would be required to take on significant costs to carry out the life cycle activities in option 1. This is especially true during years 2022, 2023, and 2024 where reconstruction activities greatly affect the cost of maintaining the road infrastructure.

Option 2: Option 2 would require the current levels of service standards to be lowered as a result of the reduction to the PCI trigger levels for the life cycle activities and thereby extending the useful life of the road assets. The risk levels for the road infrastructure would increase with this option because the average condition level for the roads would decrease below the intended target of 69 PCI. The cost to maintain the roads would decrease with this option in the short term because the condition at which the roads are reconstructed and rehabilitated has been lowered which increased the time before reconstruction and rehabilitation is required. In particular, the decrease in the reconstruction condition trigger level from 44 to 30 with option 2 extends the time until reconstruction is prescribed by

approximately 7 years. Extending the time until reconstruction would likely require more years of general maintenance for the roads in poor condition until they undergo reconstruction. The current maintenance budget is $150,000 this could increase to $300,000 per year if reconstruction is extended.

Bridges and Culverts:

Overview:

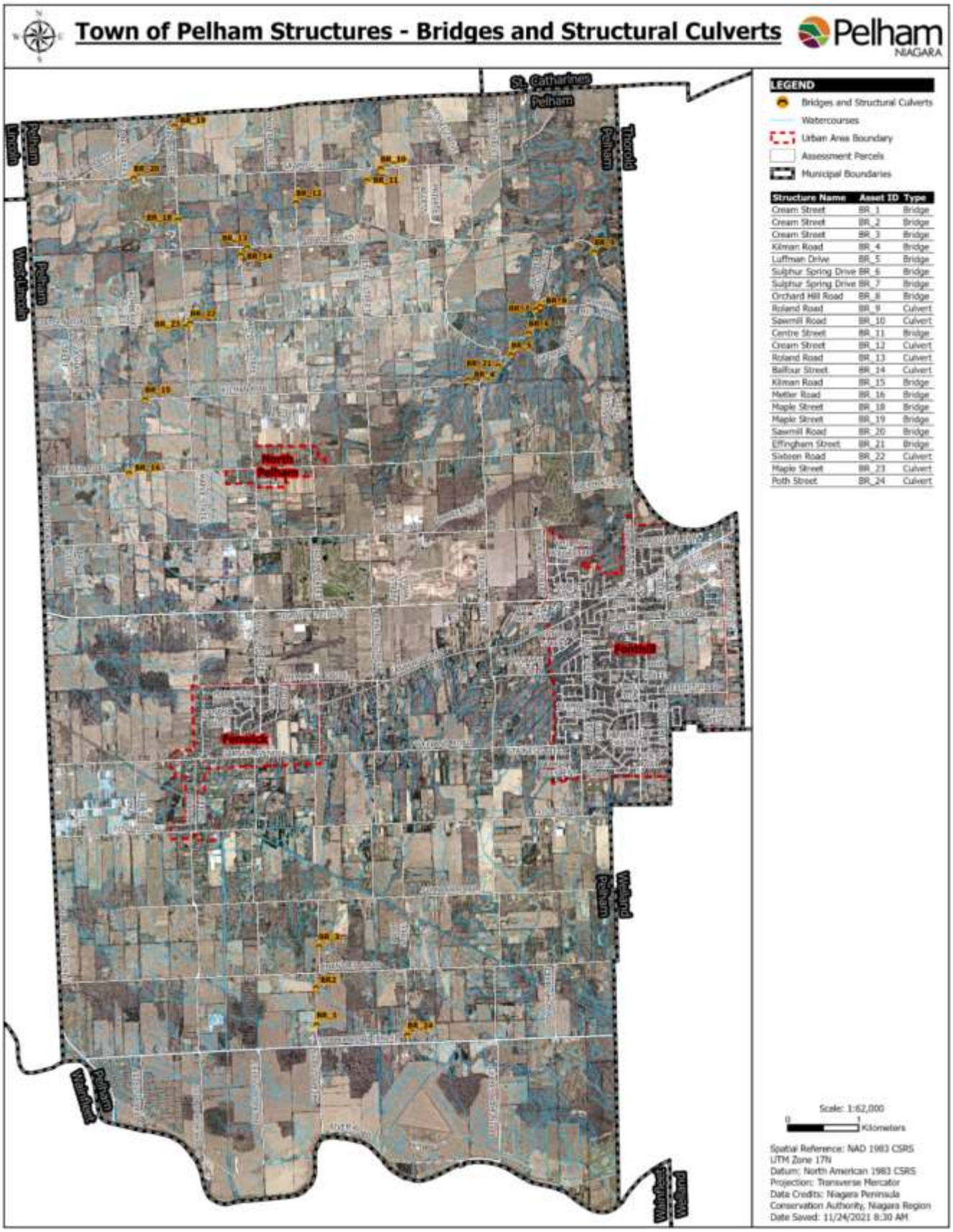
Pelham maintains 23 bridges and structural culverts with 15 bridges and 8 structural culverts respectively. These structures allow the passage of a variety of traffic including vehicles, pedestrians, and cyclists. None of the bridges or structural culverts include dimensional restrictions or load postings for the traffic they support. Over the past 10 years, Pelham has conducted traffic studies on roads with municipal bridges and structural culverts. The traffic studies primarily occurred in the spring. The majority of traffic over the past 10 years has comprised of passenger vehicles including cars and trailers which account for approximately 86% of the vehicles observed over the 10-year period. The remainder of the vehicles observed include trucks, busses, and tractor trailers in low numbers. There is limited information for the number of cyclists travelling over the roads with bridges and structural culverts. During the traffic study in spring of 2018 two bridges had a combined total of three cyclists travel across them for the duration of the traffic study that year.

All structures are classified as either bridge or culvert type structures according to the criteria contained in the municipal bridge and culvert appraisal manual. The definition is as follows:

> "Box or open type structure … and which has more than 600mm of cover shall be appraised as a culvert, and those with less than 600mm of cover shall be appraised as a bridge".

Figure 12 that follows, identifies the bridge and structural culvert assets in the Town of Pelham:

Figure 12. Town of Pelham map of core structure assets: bridges and structural culverts



Replacement cost for Bridges and Structural Culverts

The combined replacement cost for the bridges and structural culverts is: $12,977,750.

Structural culverts: The replacement cost for Pelham's structural culverts is $6,583,750.

Bridges: The replacement cost for the Town of Pelham's bridges is $6,394,000.

**Replacement cost is for replacing like for like structure-wise.*

Condition

The condition for the Town of Pelham's bridges and structural culverts is shown below in Figure 13 according to the bridge condition index values from the most recent inspection in 2020.

Figure 13. Condition for bridges and structural culverts

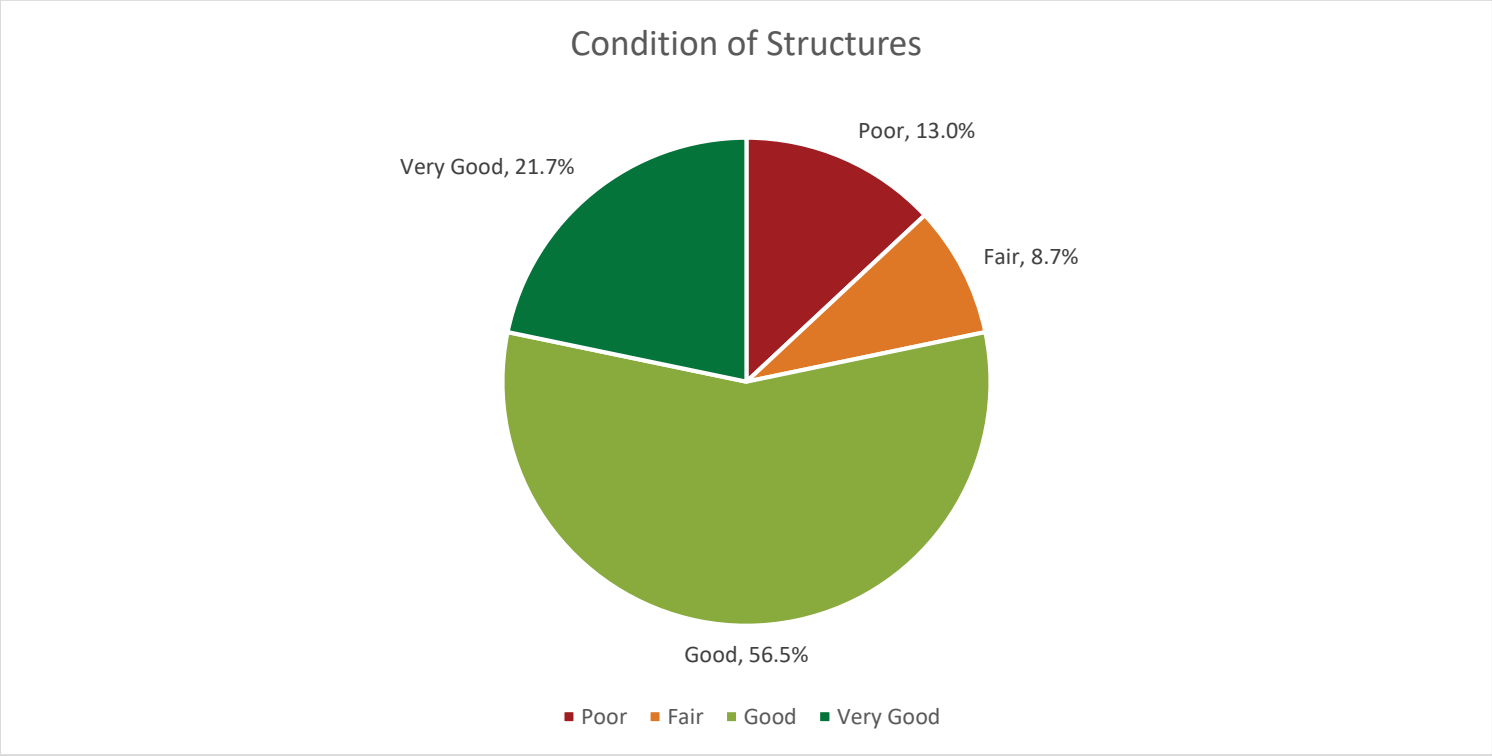


Figure 13 shows that approximately 78% of Pelham's bridges and structural culverts are in good or very good condition and approximately 22% are in fair or poor condition.

Bridges

Average Age

The average age of the Town of Pelham's bridges is 43.1 years.

Condition

The average bridge condition index for bridges in 2020 was: 73.5/100

Overall the Town of Pelham's bridges are good in condition with only one bridge in fair condition which is BR_1 on Cream St. The bridges in good or very good condition have

no change in their use with respect to their condition levels. The descriptions of the bridge in the worst condition (BR_01 Cream Street) and the bridge in the best condition (BR_20 Sawmill Road) from the most recent inspection report in 2020 are detailed below:

Cream Street BR_01 – fair condition:

The surface treated roadway is in good condition. There is a transverse crack north of the structure. The structure is in fair to good condition with some light cracking on the east side. Some cracks are evident at both ends with efflorescent staining. There is an area of medium efflorescent staining on the exterior side wall and fascia at the south east corner. There are wide (1-4mm) horizontal cracks through the structure side wall at all four corners of the structure. Two narrow cracks on the north inside wall are evident midway through the structure; there is evidence of moisture migrating through the wall. Utility conduits are attached to the structure at both ends. Footings are covered with rip rap.

Issues identified in the inspection report have been documented in photographs and included below for reference:

Figure 14. Surface treated roadway looking south.

Figure 15. East end of structure.

Figure 16. Wide horizontal crack at south east corner.

Figure 17. Interior looking east.

Sawmill Road BR_20 – very good condition:
The asphalt paved roadway is in good condition. There is steel beam guide rail over both sides of the structure in good condition. There are extruders at the north east and south west corners. There are leaving-end terminal sections at the northwest and southeast corners. The precast concrete box units are in good condition. The cast-in-place concrete wing walls and headwalls are in good condition. There are areas of light leakage and efflorescent staining on the vertical faces of the northwest, northeast, and southwest corners between the fascia and the first precast box unit. There are two small spalls along the east interior wall. Some granular fill is spilling over the tops of the wing walls at all four corners. There is light erosion at the northeast corner. Issues identified in the inspection report have been documented in photographs and included below for reference:

Figure 18. Roadway looking east.

Figure 19. Interior of structure, looking north.

Figure 20. Leakage and efflorescent staining at northwest corner.

Figure 21. South elevation.

Structural Culverts

Average Age

The average age for structural culverts is 35 years.

Condition

The average BCI for culverts in 2020 was: 68.6/100.
There are 8 structural culverts in the Municipality of Pelham which range in condition levels. 4 out of 8 culverts are in good or better condition with 3 of those culverts in very good condition. 4 out of 8 culverts are in fair or worse condition with 3 of those in poor condition. The condition of the culverts appears to be correlated to their age. The oldest culverts generally appear to be in the worst condition and were installed around the 1970s. The newest culverts were constructed in 2016, 2018 and 2019 and are all in very good condition.

Descriptions for culverts in very good condition and poor condition are detailed below from the latest inspection in 2020:

Balfour Street BR_14 - poor condition:

The surface treated roadway is in good condition. The steel multi-plate structures are in poor condition with medium to severe corrosion and perforations throughout both cells at the waterline. Extensive perforations at the waterline are causing the cell 'walls' to break off and settle behind the bottoms of each cell. The perforations along the water line are more severe in the north cell. Light deformation is evident in the tops of both cells. There is minimal fill over the pipes, approximately 300mm. There are no roadside markers at this location.

Figure 22. Roadway over structure looking south.

Figure 23. East end of pipes.

Figure 24. Interior of south cell, looking west.

Figure 25. Interior of north cell, looking east.

Sawmill Road BR_10 – very good condition:
The asphalt paved roadway is in good condition. There is granular material on the roadway at the northeast corner. There is steel beam guide rail over the structure on both sides, in good condition. There are extruder end treatments installed at all four corners of the structure. One green/white diamond hazard marker is damaged at the end of the northeast extruder. One green/white diamond hazard marker is missing at the end of the south east extruder. There is one area of light erosion in each of the granular side slopes, extending past the guide rail at approximately center span. The cast-in-place reinforced concrete abutment sidewalls, soffit, headwalls, and wing walls are in good condition. There is medium erosion at all four corners of the structure.

Figure 26. Roadway looking west.

Figure 27. South elevation.

Figure 28. Interior looking northeast.

Figure 29. Erosion at southeast corner.

Life Cycle Activities

Construction

After a new bridge or structural culvert is installed, it is inspected every 2 years to evaluate its condition and identify any issues. Pelham is legislated to complete these inspections in accordance with O. Reg. 472/10, s. 2.

Rehabilitation

Over time the condition of a bridge or structural culvert will decrease. Minor issues may include scaling, cracking, erosion, etc. in various degrees of severity and require corrective action.

Replacement

Eventually the condition of a bridge will decline significantly and it will need to be replaced with a new asset. Inspections and recommendations for bridges and culverts are also categorized by importance. For example, there may be a bridge with an overall good rating with a recommendation for immediate work to be done such as minor scour and erosion mitigation work.

The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service

The options for life cycle activities that can be undertake for the lowest cost to maintain the levels of service are detailed below in Table 9:

Table 9. 2022 Structure assets 10-year capital forecast

Budget By Strategy	2022	2023	2024	2025	2026	2027	2028	2029	2030
Re-construction	$2,403,500		$90,000		$707,250				
Rehabilitation	$99,050	$723,350	$1,311,000	$33,250	$24,850			$460,650	
Total	$2,502,550	$723,350	$1,401,000	$33,250	$732,100			$460,650	
Average RLE	68.7	42.8	49.1	74	83.5			78.7	

Lifecycle activities that can be undertaken for the lowest cost to maintain the current levels of service

The options for life cycle activities that can be undertake for the lowest cost to maintain the levels of service are detailed below in Table 10:

Table 10. Life cycle activity cost

BCI	Life Cycle Activity	Life Expectancy Gain (year)	Cost ($)	Units
40	Replace	75	5750	m^2
60	Major Rehabilitation	35	3000	m^2
70	Minor Rehabilitation	15	1200	m^2

Current Performance of Structural Assets According to Metrics Established by the Town of Pelham:

See Table 20 in the Appendix.

Sanitary Sewer System

Overview:

Pelham is responsible for the collecting wastewater discharged into its sanitary system and transferring the wastewater to the Niagara Region's sanitary sewer system which conveys the wastewater to the Welland Wastewater Treatment Plant with the aid of 5 Regional sewage pumping stations: Park Lane S.P.S., Hurricane Rd. S.P.S., Daimler Woods S.P.S., Foss Rd. S.P.S., and Timmsdale S.P.S.

Pelham's sanitary sewer system contains approximately 66 km of municipal mains and provides service across the municipality to approximately 4873 accounts and 7441 properties. Pelham's sanitary sewer system services approximately 65% of the

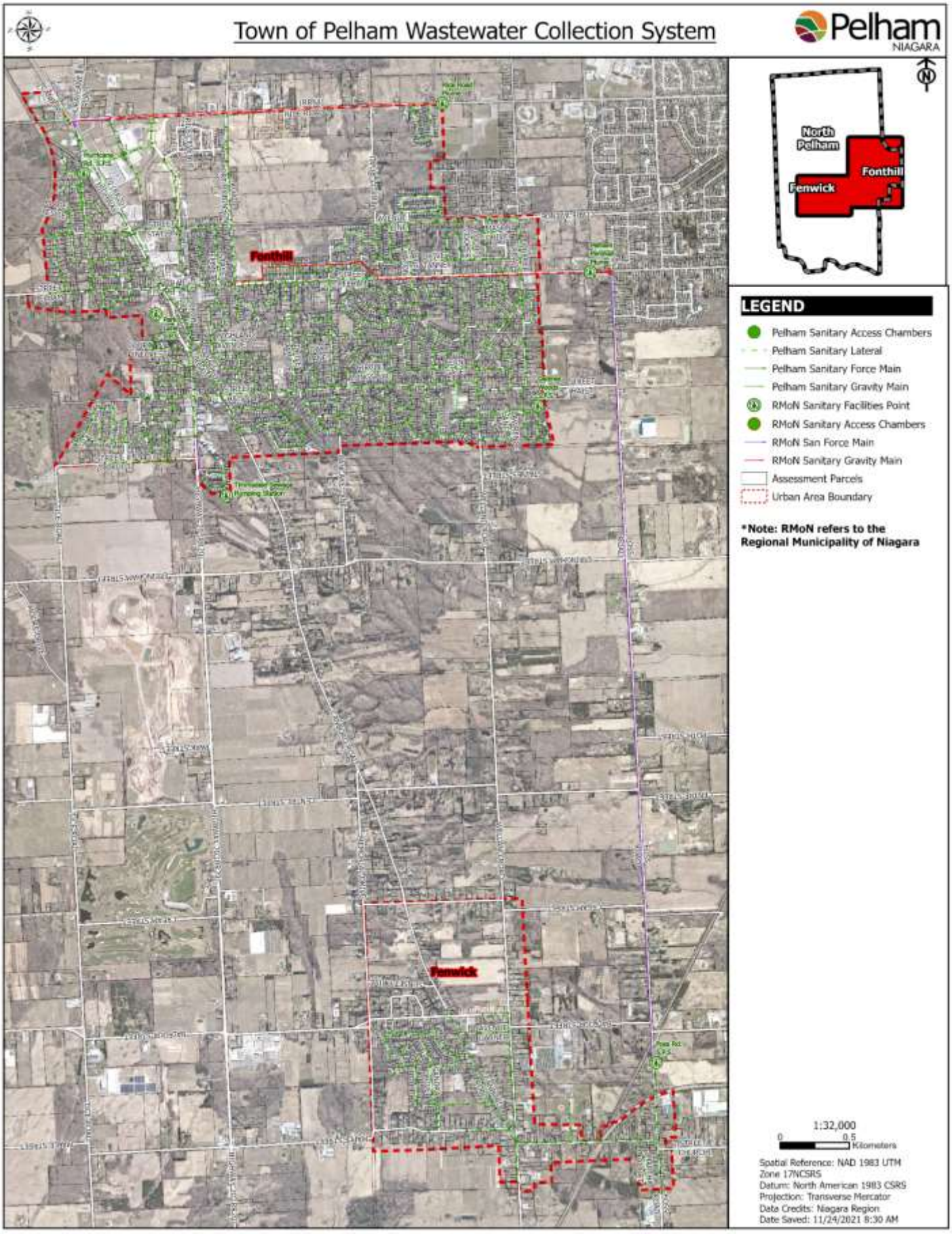
properties in the Town of Pelham in areas such as Fonthill, Ridgeville and Fenwick. Pelham's sanitary sewer mains vary in size from 150 mm – 500 mm diameter for the gravity mains and from 40 mm – 75 mm diameter for the force mains. Pelham's sanitary system does not include overflows or combined sewers.

As a result, in 2020 Pelham has experienced 0 events where combined sewer flow in the municipal wastewater system exceeded system capacity out of 4873 accounts. The Town of Pelham has experienced 0 connection days resulting from wastewater backups during 2020 with 4873 accounts.

> "Connection-days" refers to the number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue.

There is no information regarding effluent discharged from sewage treatment plants or the number of effluent violations per year. The Figure 30 that follows shows the extent of the wastewater collection system:

Figure 30. Town of Pelham wastewater collection system



Average Age:

Sanitary gravity mains:

The average age for Pelham's sanitary gravity mains is 36 years. The average age for sanitary gravity mains according to material is shown below in Table 11:

Table 11. Average Age sanitary force mains

Average Age (year)	Material
26	Polyvinyl Chloride
46	Polyethylene
49	Asbestos Cement

Sanitary force mains:

The average age for Pelham's sanitary force mains is 23 years. The average age for sanitary force mains according to material is shown below in Table 12:

Table 12. Average Age sanitary gravity mains

Average Age (year)	Material
2	Brass
21	High-density Polyethylene
39	Polyethylene

Condition:

A count of the assets according to their condition rating was performed and the results are shown below as a percentage of the total number of assets, shown below in Figure 31:

Figure 31. Sanitary gravity main condition

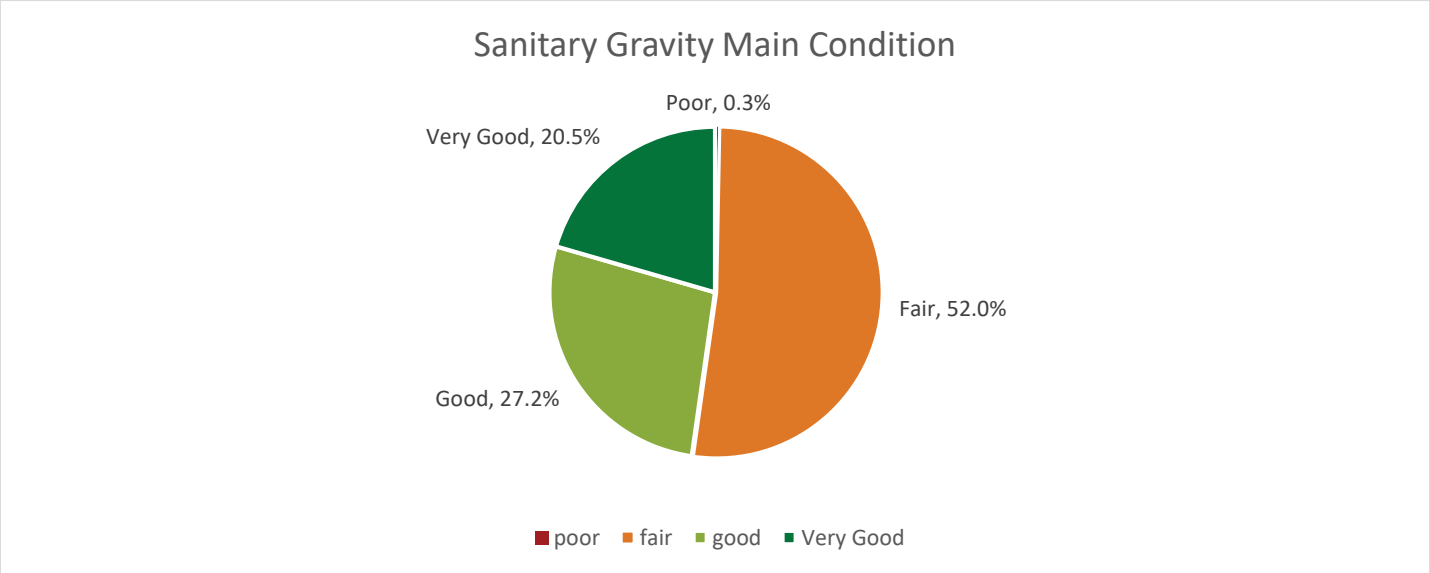


Figure 31 indicates that 47.7% of the sanitary gravity mains are estimated to be in good or very good condition and 52% to be in fair condition. 0.3% of the sanitary gravity mains are estimated to be in poor condition.

Figure 32. Sanitary force main condition

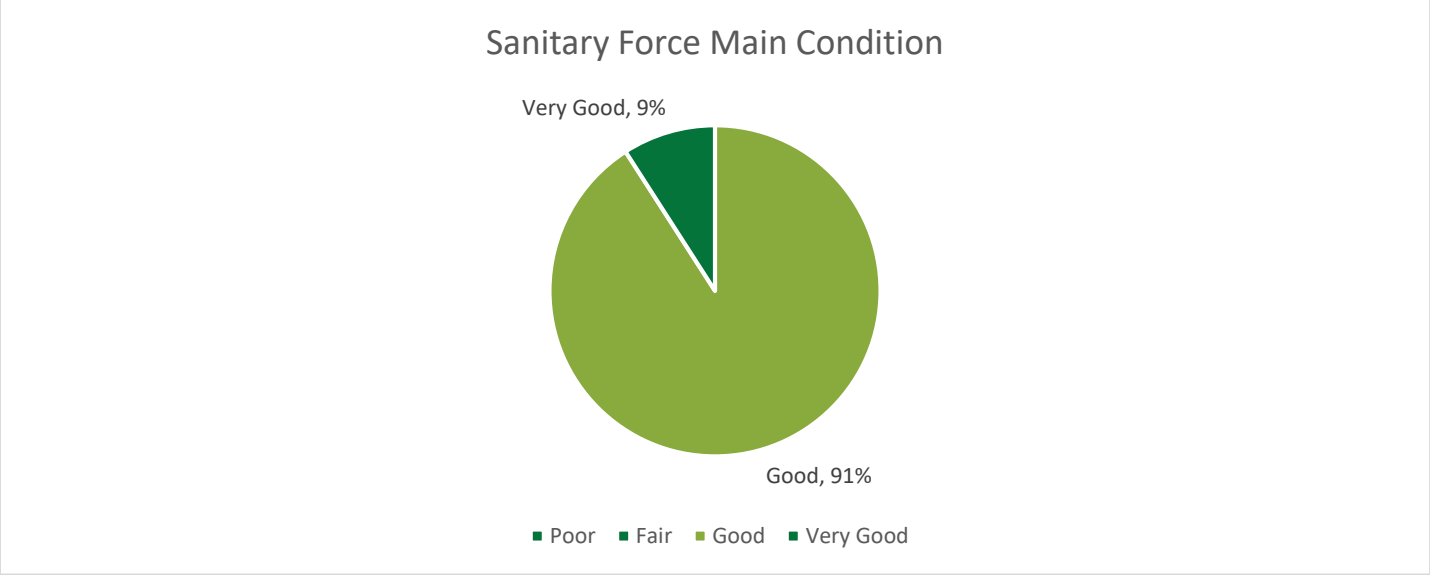


Figure 32 indicates that all of the sanitary force mains are estimated to be in good or very good condition and no sanitary force mains are in fair, or poor condition.

Life Cycle Activities

Construction

Once a new sanitary sewer main is installed, after a period of 1 year the Town of Pelham takes over the responsibility of maintaining the asset. Before the Town of Pelham takes over the responsibility of maintaining the asset a full CCTV inspection is required to show that the asset is in good condition.

Rehabilitation

- **Maintenance:** typically involves activities such as flushing to ensure that the assets are functioning properly
- **Rehabilitation:** When the condition of a sanitary sewer decreases, minor rehabilitation such as small section repairs or relining of the main is required to extend the life of the asset.

Reconstruction

Eventually the condition of a sanitary sewer main will decline significantly and it will need to be replaced with a new asset.

The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service

The options for life cycle activities that can be undertake for the lowest cost to maintain the levels of service are detailed below in Table 13:

Table 13. 2022 sanitary gravity main assets 10-year capital forecast

Budget By Strategy	2022	2023	2024	2025	2026	2027	2028	2029	2030
Re-construction								$90,306	$7,469,459
Rehabilitation									
Total								$90,306	$7,469,459
Average RLE								100	100

Within the next 10-years sanitary force main assets are not expected to require life cycle activities to maintain their levels of service. It is anticipated that lifecycle activities for sanitary force main assets will be required in 2056 when the oldest force main assets reach 75% of their life expectancy and may need to be replaced.

Lifecycle activities that can be undertaken for the lowest cost to maintain the current levels of service

The options for life cycle activities that can be undertake for the lowest cost to maintain the levels of service are detailed below in Table 14 and Table 15:

Table 14. Life cycle activities - sanitary gravity mains

Material	Age	Life Cycle activity	Life Expectancy Gain (year)	Cost ($)	Unit
Asbestos Cement	60	Main Replacement	80	1100	m
Polyvinyl Chloride	75	Main Replacement	100	1100	m
Polyethylene	75	Main Replacement	100	1100	m

Table 15. Life cycle activities - sanitary force mains

Material	Age	Life Cycle Activity	Life Expectancy Gain (year)	Cost ($)	Unit
Brass	75	Main Replacement	100	100	m
High-density polyethylene	75	Main Replacement	100	100	m

Polyethylene	75	Main Replacement	100	100	m

Current Performance of the Wastewater Collection System Assets According to Metrics Established by the Town of Pelham:

See Table 18 in the Appendix.

Water Distribution System: Water Mains

Overview:

The Town of Pelham is responsible for distributing water to local consumers via its own network of distribution pipes, which is a class 2 water distribution subsystem. The system consists of approximately 82 km of water mains varying in size from 50mm to 400mm diameter, providing water to approximately 13,300 residents (December 31st 2020) through 5318 accounts (June 30th 2021). 71% of Pelham's properties are connected to the water distribution system and each connected property is provided with adequate fire flow. The service area for Pelham's water distribution system is approximately 14 km^2 and includes the Villages of Fonthill, Ridgeville and Fenwick. The water distribution system receives treated drinking water from the Welland Water Treatment Plant located on Cross Street in the City of Welland. The treatment plant is owned and operated by the Regional Municipality of Niagara. The plant receives its raw water from the Welland Recreational Canal. Treated water is transmitted to the Town of Pelham by way of a 750mm diameter water main to the Shoalts Drive Reservoir. The reservoir, which includes chlorination, is also Regionally-owned and operated. Water enters Pelham's distribution system at the reservoir outlet.

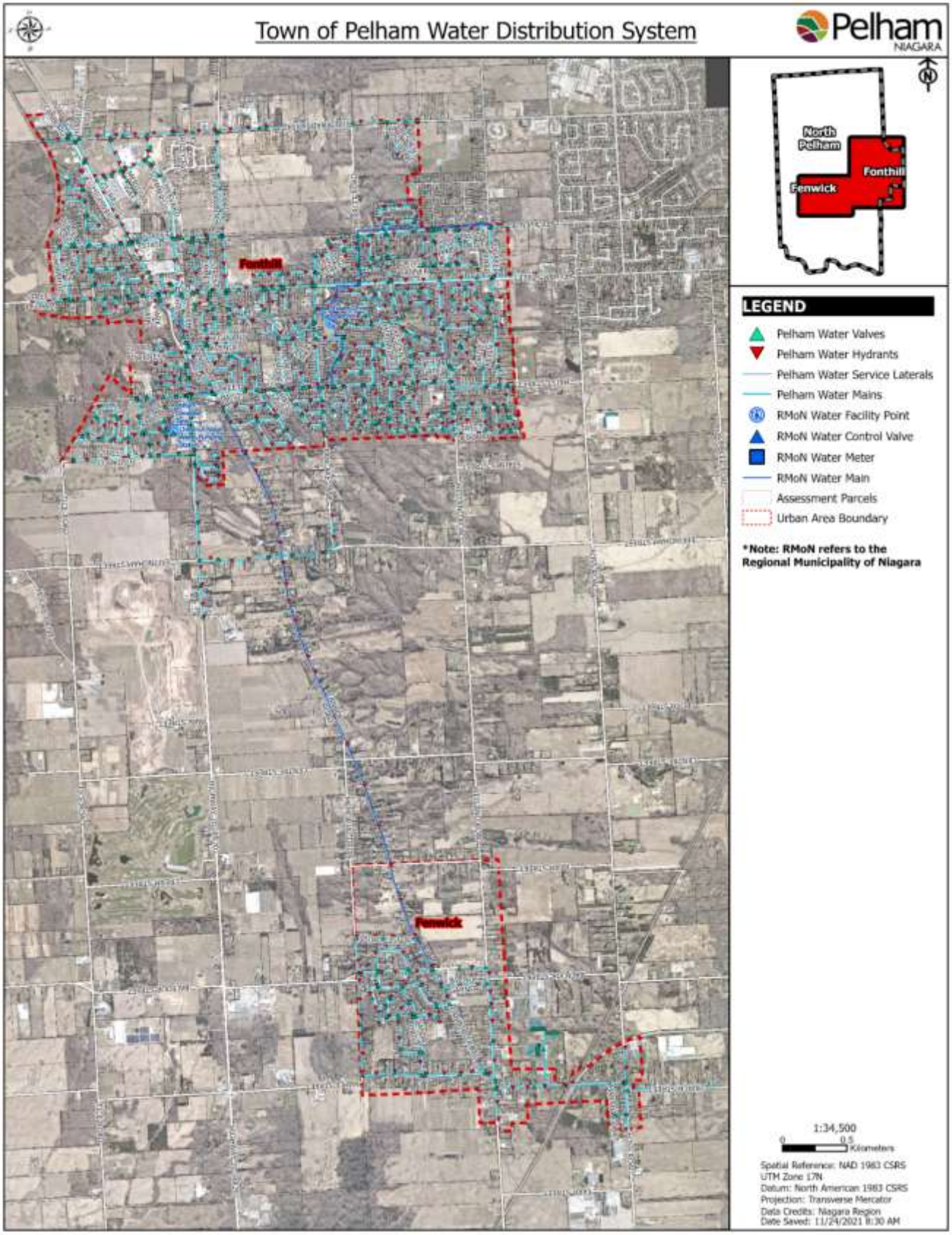
The Town of Pelham owns and operates a water filling station with side-fill and a backflow prevention device to serve consumers outside of the urban boundary who do not have direct access to the distribution system. Water haulers must obtain approval from the Niagara Region before being permitted to use the station. The Town of Pelham owns a small pressure booster pump station which is located on the Niagara Region's Elevated Tank Property. This pumping station is used to improve water pressure in the Chestnut Ridge development area. The normal operating pressure in the area is low due to its geographic location in relation to the elevated tank that supplies distribution supply and pressure by way of gravity.

The Town of Pelham's water distribution system is well maintained and has experienced few issues in the past several years. Pelham has had 0 connection-days during 2020 out of 5318 accounts.

> "Connection-days" refers to the number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue.

During 2020 only 2 water main breaks occurred in Pelham's water distribution system and over the past 2 years, Pelham has had 0 water boil advisories.

Figure 33. Town of Pelham water distribution system



Average Age:

The average age for Pelham's water main assets is: 27 years. The average age by material is shown in Table 16 below:

Table 16. Water main condition according to asset material

Age (year)	Material
47.7	Asbestos Cement
67.1	Cast Iron
22.9	Copper
20.0	High-density Polyethylene
20.9	Hyprescon
15.9	Polyethylene
18.1	Polyvinyl Chloride

Condition:

A count of the assets according to their condition rating was performed and the results are shown in Figure 34 below as a percentage of the total assets:

Figure 34. Water Main Condition

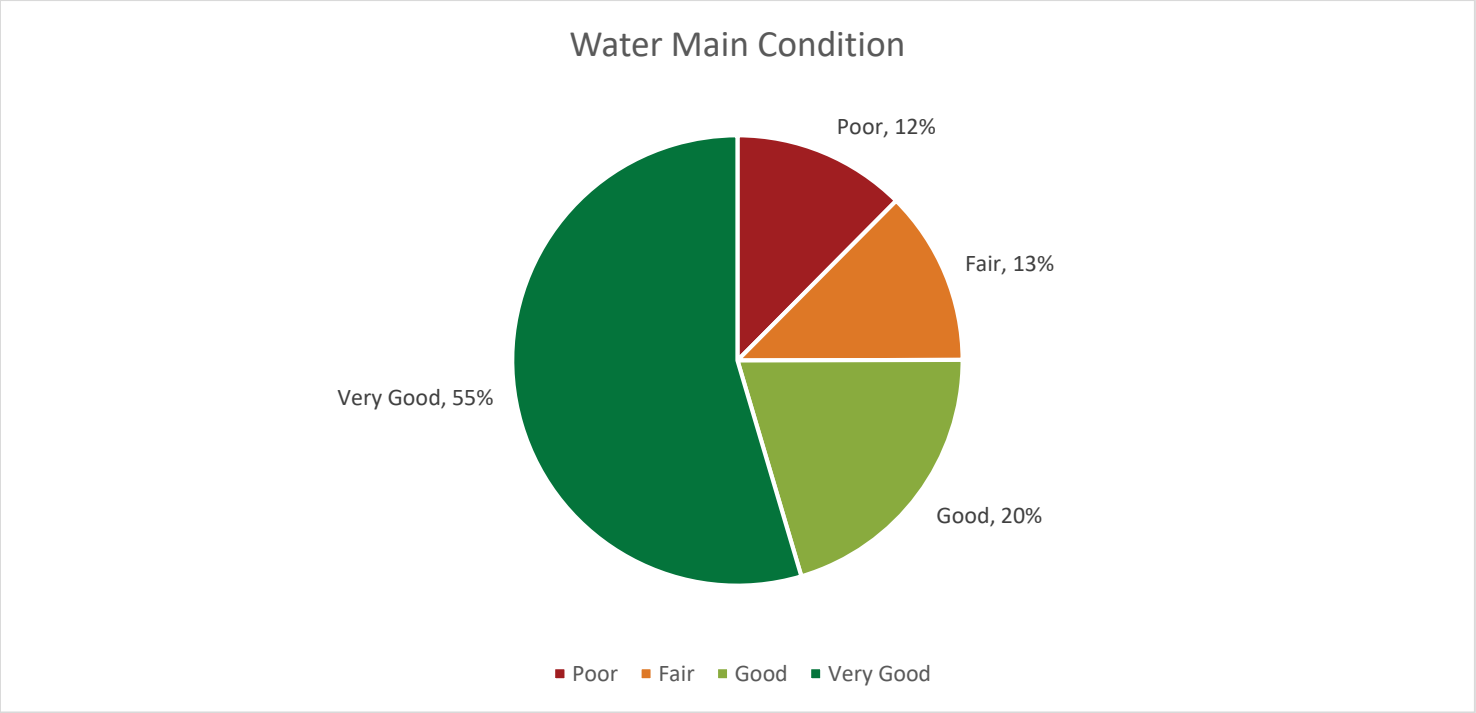


Figure 34 indicates that the 75% of the water main assets are estimated to be in good or very good condition and 25% of Pelham's water mains to be in fair or poor condition.

Life Cycle Activities

Construction

Once the water main is installed, after a period of 1 year, the Town of Pelham takes over the maintenance of the asset. Pelham requires a new water main to undergo flushing, swabbing, and a chlorination treatment.

Rehabilitation

- **Maintenance:** such as cleaning and relining is performed to ensure the asset is functioning properly.
- **Rehabilitation:** Over time the condition of a water main will decrease. Minor issues such as leaks can be repaired by patches or by replacing small sections of water main.

Replacement

Eventually the condition of a water main will decline significantly and it will need to be replaced with a new asset.

Current Performance of Water Distribution System Assets According to Metrics Established by the Town of Pelham

See Table 17 in the Appendix.

Storm Water System

Overview

Pelham's storm water system encompasses the majority of the urban boundaries. The old village sections of Fonthill and Fenwick are not fully supported by the storm water system and are undergoing construction efforts to add storm water infrastructure. Pelham has 3% of its properties constructed to be resilient to a 100-year storm however 100% of the storm water system in the Town of Pelham is resilient to a 5-year storm.

Average age, Condition, and Replacement cost

The information regarding the average age, condition, and replacement cost for the storm water system is pending the completion of the storm water main asset inventory.

Life Cycle Activities:

Construction

Once the storm water main is installed, after a period of 1 year, the Town of Pelham takes over the maintenance of the asset. The Town of Pelham requires an inspection with full CCVT footage showing that the asset is in good condition.

Rehabilitation

If a storm water main experiences minor issues, minor repairs may be required.

Replacement:
Eventually the condition of a storm water main will decline significantly and it will need to be replaced with a new asset.

Current Performance of Storm Water Assets According to Metrics Established by the Town of Pelham

See Table 19 in the Appendix.

Appendix

Appendix 1: Requirements of O.Reg 588/17

Asset management plans, current levels of service

5. (1) Every municipality shall prepare an asset management plan in respect of its core municipal infrastructure assets by July 1, 2022, and in respect of all of its other municipal infrastructure assets by July 1, 2024.

(2) A municipality's asset management plan must include the following:

1. For each asset category, the current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at most the two calendar years prior to the year in which all information required under this section is included in the asset management plan:

i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.

ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.

2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency, and based on data from at most two calendar years prior to the year in which all information required under this section is included in the asset management plan.

3. For each asset category,

i. a summary of the assets in the category,

ii. the replacement cost of the assets in the category,

iii. the average age of the assets in the category, determined by assessing the average age of the components of the assets,

iv. the information available on the condition of the assets in the category, and

v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.

4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:

i. The full lifecycle of the assets.

ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.

iii. The risks associated with the options referred to in subparagraph ii.

iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, the following:

i. A description of assumptions regarding future changes in population or economic activity.

ii. How the assumptions referred to in subparagraph i relate to the information required by paragraph 4.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census, the following:

i. With respect to municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are set out in Schedule 3 or 7 to the 2017 Growth Plan, those forecasts.

ii. With respect to lower-tier municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are not set out in Schedule 7 to the 2017 Growth Plan, the portion of the forecasts allocated to the lower-tier municipality in the official plan of the upper-tier municipality of which it is a part.

iii. With respect to upper-tier municipalities or single-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the municipality that are set out in its official plan.

iv. With respect to lower-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the lower-tier municipality that are set out in the official plan of the upper-tier municipality of which it is a part.

v. If, with respect to any municipality referred to in subparagraph iii or iv, the population and employment forecasts for the municipality cannot be determined as set out in those subparagraphs, a description of assumptions regarding future changes in population or economic activity.

vi. For each of the 10 years following the year for which the current levels of service under paragraph 1 are determined, the estimated capital expenditures and significant operating costs

related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets.

(3) Every asset management plan must indicate how all background information and reports upon which the information required by paragraph 3 of subsection (2) is based will be made available to the public.

(4) In this section, "2017 Growth Plan" means the Growth Plan for the Greater Golden Horseshoe, 2017 that was approved under subsection 7 (6) of the *Places to Grow Act, 2005* on May 16, 2017 and came into effect on July 1, 2017; ("Plan de croissance de 2017") "Greater Golden Horseshoe growth plan area" means the area designated by section 2 of Ontario Regulation 416/05 (Growth Plan Areas) made under the *Places to Grow Act, 2005*. ("zone de croissance planifiée de la région élargie du Golden Horseshoe")

Asset management plans, proposed levels of service

6. (1) Subject to subsection (2), by July 1, 2025, every asset management plan prepared under section 5 must include the following additional information:

1. For each asset category, the levels of service that the municipality proposes to provide for each of the 10 years following the year in which all information required under section 5 and this section is included in the asset management plan, determined in accordance with the following qualitative descriptions and technical metrics:

i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.

ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.

2. An explanation of why the proposed levels of service under paragraph 1 are appropriate for the municipality, based on an assessment of the following:

i. The options for the proposed levels of service and the risks associated with those options to the long-term sustainability of the municipality.

ii. How the proposed levels of service differ from the current levels of service set out under paragraph 1 of subsection 5 (2).

iii. Whether the proposed levels of service are achievable.

iv. The municipality's ability to afford the proposed levels of service.

3. The proposed performance of each asset category for each year of the 10-year period referred to in paragraph 1, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency.

4. A lifecycle management and financial strategy that sets out the following information with respect to the assets in each asset category for the 10-year period referred to in paragraph 1:

i. An identification of the lifecycle activities that would need to be undertaken to provide the proposed levels of service described in paragraph 1, based on an assessment of the following:

A. The full lifecycle of the assets.

B. The options for which lifecycle activities could potentially be undertaken to achieve the proposed levels of service.

C. The risks associated with the options referred to in sub-subparagraph B.

D. The lifecycle activities referred to in sub-subparagraph B that can be undertaken for the lowest cost to achieve the proposed levels of service.

ii. An estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities identified in subparagraph i, separated into capital expenditures and significant operating costs.

iii. An identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.

iv. If, based on the funding projected to be available, the municipality identifies a funding shortfall for the lifecycle activities identified in subparagraph i,

A. an identification of the lifecycle activities, whether set out in subparagraph i or otherwise, that the municipality will undertake, and

B. if applicable, an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities identified in subparagraph i.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, a discussion of how the assumptions regarding future changes in population and economic activity, set out in subparagraph 5 i of subsection 5 (2), informed the preparation of the lifecycle management and financial strategy referred to in paragraph 4 of this subsection.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census,

i. the estimated capital expenditures and significant operating costs to achieve the proposed levels of service as described in paragraph 1 in order to accommodate projected increases in demand caused by population and employment growth, as set out in the forecasts or assumptions referred to in paragraph 6 of subsection 5 (2), including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets,

ii. the funding projected to be available, by source, as a result of increased population and economic activity, and

iii. an overview of the risks associated with implementation of the asset management plan and any actions that would be proposed in response to those risks.

7. An explanation of any other key assumptions underlying the plan that have not previously been explained.

(2) With respect to an asset management plan prepared under section 5 on or before July 1, 2022, if the additional information required under this section is not included before July 1, 2024, the municipality shall, before including the additional information, update the current levels of service set out under paragraph 1 of subsection 5 (2) and the current performance measures set out under paragraph 2 of subsection 5 (2) based on data from the two most recent calendar years.

Update of asset management plans

7. (1) Every municipality shall review and update its asset management plan at least five years after the year in which the plan is completed under section 6 and at least every five years thereafter.

(2) The updated asset management plan must comply with the requirements set out under paragraphs 1, 2 and 3 and subparagraphs 5 i and 6 i, ii, iii, iv and v of subsection 5 (2), subsection 5 (3) and paragraphs 1 to 7 of subsection 6 (1).

Endorsement and approval required

8. Every asset management plan prepared under section 5 or 6, or updated under section 7, must be,

(a) endorsed by the executive lead of the municipality; and

(b) approved by a resolution passed by the municipal council.

Annual review of asset management planning progress

9. (1) Every municipal council shall conduct an annual review of its asset management progress on or before July 1 in each year, starting the year after the municipality's asset management plan is completed under section 6.

(2) The annual review must address,

(a) the municipality's progress in implementing its asset management plan;

(b) any factors impeding the municipality's ability to implement its asset management plan; and

(c) a strategy to address the factors described in clause (b).

Public availability:

10. Every municipality shall post its current strategic asset management policy and asset management plan on a website that is available to the public, and shall provide a copy of the policy and plan to any person who requests it.

Table 1
Water assets

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system. 2. Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	1. Percentage of properties connected to the municipal water system. 2. Percentage of properties where fire flow is available.
Reliability	Description of boil water advisories and service interruptions.	1. The number 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. 2. The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.

Table 2
Wastewater assets

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	Percentage of properties connected to the municipal wastewater system.
Reliability	1. Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes. 2. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches. 3. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into	1. The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system. 2. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system. 3. The number of effluent

	streets or backup into homes. 4. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in paragraph 3. 5. Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.

Table 3
Stormwater management assets

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	1. Percentage of properties in municipality resilient to a 100-year storm. 2. Percentage of the municipal stormwater management system resilient to a 5-year storm.

Table 4
roads

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres

		of land area of the municipality.
Quality	Description or images that illustrate the different levels of road class pavement condition.	1. For paved roads in the municipality, the average pavement condition index value. 2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).

Table 5
bridges and Culverts

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Percentage of bridges in the municipality with loading or dimensional restrictions.
Quality	1. Description or images of the condition of bridges and how this would affect use of the bridges. 2. Description or images of the condition of culverts and how this would affect use of the culverts.	1. For bridges in the municipality, the average bridge condition index value. 2. For structural culverts in the municipality, the average bridge condition index value.

Water Distribution System

Table 17. Water distribution system levels of service metrics as determined by the Town of Pelham

Customer/Council Focused					**Technical Focused**				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide safe, clean and efficient drinking water distribution system with adequate pressure and flow with minimal interruptions.	Safe	Number of Boil Water Advisories per year	0 in 2020	0	Water mains	Condition	All applicable water quality regulations	Pelham has met all applicable water quality regulations.	Abide by all applicable water regulations.
					Water mains	Condition	% of system susceptible to intrusion of contaminated water	0%	0%
		% of system with adequate fire flow coverage	100% of the system has adequate fire flow coverage	100%	Water mains	Capacity	Number of water mains attributed to causing areas where there is inadequate fire flow @ 20 PSI	0 water mains have been attributed to causing areas of inadequate fire flow in 2020.	0 water mains

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide safe, clean and efficient drinking water distribution system with adequate pressure and flow with minimal interruptions.	Efficient	Operational cost as % of replacement value of system	Information is pending the completion of the water distribution system asset inventories.	2%	Water mains	Condition	% of unaccounted for water loss	8.4%	<12%
	Adequate Pressure and Flow	Number of customer complaints about pressure or flow	In 2020 9 people complained about pressure	0	Water mains	Capacity	% of serviced population with pressure < 40 psi or > 100 psi	100% Town wide pressure is within range.	100%
					Water mains	Capacity	Number of water mains attributed to causing areas where there is inadequate flow available	0 water mains are causing inadequate flow	0

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide safe, clean and efficient drinking water distribution system with adequate pressure and flow with minimal interruptions.	Minimal Interruptions				Water mains	Condition	Length of local water mains in poor or worse condition and length of transmission water main in fair or worse condition	Length of local water mains in poor or worse condition: 9.8 km The Niagara Region maintains the transmission water mains.	0 water mains past expected life
					Water mains	Condition	Number of breaks per km of water main per year.	2 breaks/82km of water main in 2020	Less than 10 breaks/km/ year
					Water mains	Capacity	Average time to repair water main breaks.	Information will be available to determine current performance within 1 to 5 years	6 hours

Wastewater Collection System

Table 18. Wastewater Collection system levels of service metrics as determined by the Town of Pelham

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
To provide an efficient, reliable sanitary sewer collection system that minimizes environmental impacts and is capable of accommodating growth.	Efficient	Information is pending the completion of the Wastewater distribution system asset inventories.	Information will be available to determine current performance within 1 to 5 years	2%	Sanitary Sewers	Corporate	See Operational Cost per km of sanitary sewer	Information will be available to determine current performance within 1 to 5 years	TBD
					Sanitary Sewers	Corporate	Volume of wet weather flow treated by RMON (paid by Welland)	**Existing design peak wet weather flow *Current as of Niagara Region's 2016 Master Servicing Plan*** **Welland (WWTP)** • 1,667.1 (L/s) **Timmsdale (SPS)** • 3.1 (L/s) **Hurricane Road SPS** • 45.6 (L/s) **Foss Road SPS** • 43.3 (L/s) **Park Lane SPS** • 3.0 (L/s) **Daimler Woods SPS** • 3.3 (L/s)	TBD

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
To provide an efficient, reliable sanitary sewer collection system that minimizes environmental impacts and is capable of accommodating growth.	Reliable	# of sewer backups attributed to blockages in sanitary sewer	2 sewer backups attributed to blockages in 2020	0	Sanitary Sewers	Condition	# of pipes with PACP Operating and Structural Rating >= 4 (or in poor or worse condition)	Information will be available to determine current performance within 1 to 5 years	TBD
					Sanitary Sewers	Condition	Average PACP Operating and Structural Rating (or average condition)	Information will be available to determine current performance within 1 to 5 years	TBD
					Sanitary Sewers	Condition	% of required improvements to improve the condition of the sewers that will be able to be completed by the recommended date	Information will be available to determine current performance within 1 to 5 years	TBD
	Minimal impact to environment	Overflows (# or volume - arethere flow meters on the overflows?)	2020 – 0 overflows	0	Sanitary Sewers	Capacity	Number of sewers with insufficient capacity	Information will be available to determine current performance will be available within 1 to 5 years.	0
					Sanitary Sewers	Capacity	Number of overflow occurrences	0	0

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
To provide an efficient, reliable sanitary sewer collection system that minimizes environmental impacts and is capable of accommodating growth.	Able to accommodate growth	% of urban area with sufficient infrastructure to accommodate population increase	Information will be available to determine current performance within 1 to 5 years	%100	Sanitary Sewers	Growth	% of system with D actual vs. D design > target	Information will be available to determine current performance will be available within 1 to 5 years.	65% estimate

Storm Water System

Table 19. Storm water system levels of service metrics as determined by the Town of Pelham

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide an efficient, reliable storm water system that minimizes impacts to the environment and public/ private property.	Efficient	Operational cost as % of replacement value of system	Information will be available to determine current performance within 1 to 5 years	2%	Storm Sewers	Corporate	Operational Cost per km of storm sewer	Information will be available to determine current performance within 1 to 5 years	TBD
					Storm Ponds	Corporate	Operational Cost per storm pond	Information will be available to determine current performance within 1 to 5 years	TBD
	Reliable	Number of complaints of flooding during typical wet weather events	4	0	Storm Sewers	Capacity	Percent of system with sufficient capacity to convey 1:5-year, minor storm	100%	100%
					Storm Sewers	Condition	Average condition of storm water mains	Information will be available to determine current performance within 1 to 5 years	PACP <=4

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide an efficient, reliable storm water system that minimizes impacts to the environment and public/ private property.	Reliable				Storm Sewers	Condition	Length of storm water mains that are in poor or very poor condition	Information will be available to determine current performance within 1 to 5 years	TBD
					Hydraulic Structures	Capacity	Number of culverts/bridges with inadequate capacity to safely convey 1:5-year, minor storm	0	0
					Storm Ponds	Condition	Number of ponds in poor or very poor condition	0	0
	Minimal impact to the environment	Water quality in the surrounding water bodies	Information is currently pending a storm water pond inspection report	70% suspended solids	Storm Ponds	Capacity	Number of ponds where sediment volume exceeds level required for proper treatment to occur.	Information is currently pending a storm water pond inspection report.	0
					Storm Ponds	Capacity	Number of ponds where effluent water quality exceeds target level	No combined sewers.	TBD

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide an efficient, reliable storm water system that minimizes impacts to the environment and public/ private property.	Minimal impact to the environment				Storm Sewers	Capacity	Length of combined sewers in system	There are 0 combined sewers in Pelham's system.	TBD
	Minimal impact to property	Number of locations in the City prone to flooding during wet weather events	Information will be available to determine current performance within 1 to 5 years	TBD	Storm Ponds/ Storm Sewers	Capacity	Number of areas with flooding issues impeded by non-related items	Information will be available to determine current performance within 1 to 5 years	0
					Storm Sewers	Capacity	Number of critical roads where flooding exceeds 100 mm during Regulatory Storm (assuming 5-year storm)	All roads can accommodate 100mm rainfall	0
					Water Bodies	Capacity	Number of locations near rivers/streams where flood elevations impact private property during wet weather events	Information is not currently available.	TBD

Transportation (Roads/Bridges)

Table 20. Transportation system levels of service metrics as determined by the Town of Pelham

Customer/Council Focused					**Technical Focused**				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide a safe, efficient, accessible, well maintained transportation system that provides choices while meeting the needs and expectations of users.	Safe transportation network	Number of incidents per 1,000 cars/ pedestrians/ cyclists	Information will be available to determine current performance will be available within 1 to 5 years.	TBD	Bridges	Condition	% of bridges in fair or worse condition	There are 4/23 bridges/large culverts in fair or worse condition = 5.75%.	0%
					Roads	Condition	Length of roads with PCI < 50	9.5 km	TBD
						Condition	Average PCI of roads	69	TBD
						Capacity	Number of complaints about unsafe roads for vehicles/ cyclists/ pedestrians	In 2020 there were 19 complaints about unsafe roads for vehicles/ cyclists/ pedestrians	0
	Efficient	Operational cost as % of replacement value of system	Information is pending the completion of the transportation system asset inventories.	5%	Bridges	Corporate	Operational cost per bridge	TBD	TBD
					Roads	Corporate	Operational cost per km of road	TBD	TBD

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide a safe, efficient, accessible, well maintained transportation system that provides choices while meeting the needs and expectations of users	Accessible	% of transportation system that is fully accessible	Everything with exception of Orchard Hill beginning Dec – end of April	100%	Roads	Corporate	% of roads that can accommodate 1.5 m sidewalks	All urban settings – possible – 18m right of way	100%
	Well maintained transportation network	Number of complaints regarding condition of transportation network	There have been 103 complaints regarding the condition of the transportation network in 2020.	0	Bridges	Condition	Number of bridges will outstanding work orders	0	0
						Condition	average time to address bridge work order	Information is not currently available.	10 days major restoration/1years minor restoration
					Roads	Condition	Number of outstanding work orders fall out of mms guidelines	0 in 2020	0
						Condition	average time to address road work orders	Information is not currently available/	Abide by the MMS

Customer/Council Focused					**Technical Focused**				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide a safe, efficient, accessible, well maintained transportation system that provides choices while meeting the needs and expectations of users	Provide choices	Length of cycling and pedestrian network	The cycling and pedestrian network totals 180 km	TBD	Bridges	Capacity	Number of bridges WITHOUT sufficient width/span to accommodate all forms of transportation	0	0
					Roads	Capacity	km of roads NOT designed to accommodate all forms of transportation	All urban roads can accommodate all forms of traffic. Additionally, for Sulphur Springs, Luffman Drive, and Orchard Hill, the right-of-way is less than standard but can still accommodate all vehicles.	0

Customer/Council Focused					**Technical Focused**				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide a safe, efficient, accessible, well maintained transportation system that provides choices while meeting the needs and expectations of users	Provide choices	Modal split for trips to work/others?	Survey results from 2016 PATC Master Plan: (113 people surveyed) **Walking:** Health/fitness – 72% Recreation – 57% Errands – 26% Work – 31% **Cycling:** Health/fitness – 65% Recreation – 35% Errands – 12% Work – 7%	TBD	All	Capacity	percentage of trips to work completed by cycling	Information will be available to determine current performance within 1 to 5 years	TBD
					All	Capacity	Percentage of trips to work completed by walking	Information will be available to determine current performance within 1 to 5 years	TBD
					All	Capacity	Percentage of trips to work completed by transit	Information will be available to determine current performance within 1 to 5 years	TBD
					All	Capacity	Percentage of trips to work completed by car	Information will be available to determine current performance within 1 to 5 years	TBD

Customer/Council Focused					Technical Focused				
Customer Service Statement	Service Provided	Performance Measure (Indicator)	Current Performance	Target	Assets Impacting Service	Driver	Technical KPI	Current Performance	Target
Provide a safe, efficient, accessible, well maintained transportation system that provides choices while meeting the needs and expectations of users	Meets the needs and expectations of users	Percentage of residents whose needs and expectations are met in transportation system	Approximately 0.67% of the population filed a complaint about the transportation system in 2020 and 99.33% of the residents had their expectations met.	100%	Roads	Capacity	Number of complaints about traffic delays	There have been 0 complaints about traffic delays in 2020	0
					Roads	Condition	Number of complaints about road condition	There were 63 complaints about road condition in 2020	TBD

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