Asset Management Plan

June 30, 2025

The TOWNSHIP of NORTH DUMFRIES

Contents

Executive Summary

The Asset Management Plan ("AMP") has been developed to manage the strategies by which the Township of North Dumfries (the "Township") governs its capital assets. The Township's plan is consistent with the requirements under Ontario Regulation 588/17 (O. Reg. 588/17) Asset Management Planning for Municipal Infrastructure including the requirements related to proposed level of service. The 2025 version of the Township's AMP includes the current level of service for all core and non-core assets and set outs the proposed level of services over a ten-year period. The AMP is a critical step in managing the appropriate level of service against the cost of maintaining and improving the Township's assets. The following is a highlight of some of the key results from the plan:

- Total Replacement Costs for the Township assets are $297,655,653

	Replacement Costs
Road Network	151,334,560
Bridges and Culverts	41,645,433
Stormwater	29,248,400
Facilities	51,306,807
Park and Amenities	9,637,876
Rolling Stock	12,222,046
Equipment and Other	2,260,531
Total Replacement Costs	297,655,653

- Overall, the Township's assets are considered to be in fair condition.
- The Township has a funding gap of $30.3 million over the next 10 years.

1. Introduction

This Asset Management Plan ("AMP") documents the Township of North Dumfries' (the "Township") capital assets and the related strategy to maintain the assets with a medium to long-term focus. The AMP serves as a comprehensive framework that encompasses both core assets and non-core assets within the Township. Core assets include essential infrastructure components such as roads, bridges, culverts, and stormwater management. Non-core assets, encompass all other assets owned by the Township, such as parks, facilities, municipal fleet, etc.

This iteration of the AMP builds upon the existing core assets aspect by integrating it with the non-core assets. It brings the plan into compliance with Ontario Regulation 588/17 (O. Reg. 588/17). It defines the Current Service Level and proposed future service levels with financial strategies. The initial purchase price of an asset is only a small fraction of the costs associated with owning the asset and consideration needs to be given to the cost of operating and maintaining assets each year. As assets naturally deteriorate over time, investment in the asset becomes necessary to maintain or improve their condition and extend their useful life in order to maintain the desired level of service provided by the asset. The AMP provides a roadmap for Council and Staff that will inform and guide the decision-making processes related but not limited to budgeting, contribution to Reserves, maintenance, and long-term fiscal planning.

1.1 Overview

Asset management is the process of making the best possible decisions in relation to the creation, maintenance, renewal, rehabilitation, and disposal of infrastructure assets. The overall objective of asset management is to maximize the benefits the asset provides, minimize overall risk, and to provide satisfactory levels of service (LOS).

Asset management considers risks related to the overall lifecycle of the assets, and requires a multi-disciplinary team of planning, finance, engineering, technology, maintenance, and operations. Asset Management considers the full lifecycle of the infrastructure, not just the initial cost for designing and constructing the asset, but the operations and maintenance every year. Asset management is a comprehensive

methodology employed by municipalities to make well-informed choices regarding their infrastructure. At its essence, asset management revolves around providing sustainable services to communities. At the core of asset management, these fundamental questions exist and must be answered as described in the Infrastructure Guide: Managing Infrastructure Assets (October 2005).

1. What assets are currently in your possession, and where are they located?
2. How much are the assets worth now?
3. What is the condition of these assets, and how much longer can these assets be expected to serve?
4. What level of service do you require from these assets, and what maintenance or improvements are necessary?
5. When do you anticipate needing to address these asset-related matters?
6. What are the associated costs, and how do you evaluate acceptable risks?
7. How do you ensure that these assets remain affordable over the long term?

These seven essential questions align to the four (4) phases of asset management, asset inventory, condition, levels of service (LOS), and strategy development. These questions align with Ontario Regulation (O. Reg.) 588/17.

1.2 Scope of the Asset Management Plan

The Asset Management Plan serves as a strategic tool for overseeing the complete lifecycle of physical assets that underpin the Township of North Dumfries' service delivery. It ensures that these assets consistently meet the essential levels of service required. The AMP takes a medium to long-term perspective, aiding decision-making related to asset repairs, rehabilitation, replacement, and risk management.

The **Core Assets** owned by the Township of North Dumfries and included in the AMP are as follows:

- Roads (includes streetlights and sidewalks, where applicable)
- Stormwater Management
- Bridges and Major Culverts (greater than 3 m span)

The **Non-Core Assets** are all other assets owned and operated by the Township that are categorized as follows:

- Parks and Land Improvements
- Facilities
- Fleet
- IT and Communications Software
- Machinery and Equipment

The plan has complied an inventory of all assets owned and operated by the Township, including relevant attributes and replacement costs. The current condition of the assets was set using a combination of staff knowledge, background reports and studies, and age-based condition analysis. Current service levels have been defined with relevant performance measures. The plan develops lifecycle management strategies that are required to sustain the proposed level of services. The AMP also includes a financial strategy to support the lifecycle management strategy. The AMP is a living document and needs to be reviewed and updated on a regular basis.

1.3 State of the Local Infrastructure

Each section of the State of Local Infrastructure for both the Core and Non-Core assets sets out the following information.

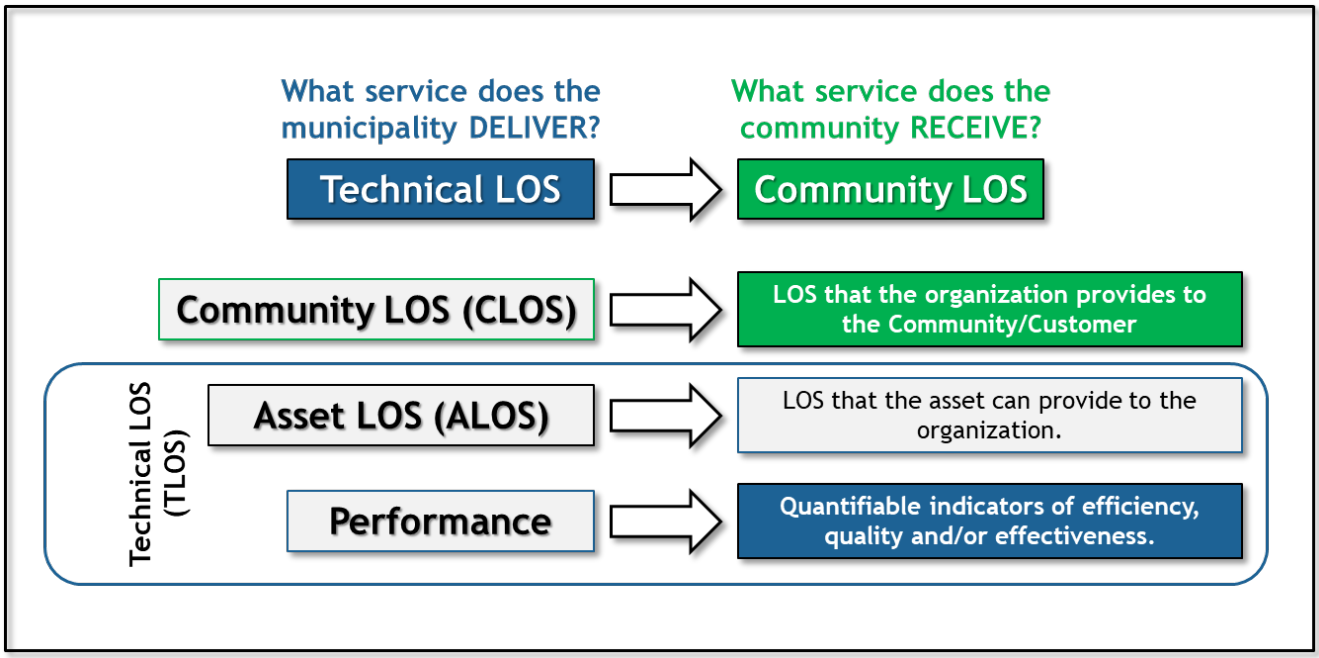
- A summary of the assets in the category.
- The replacement cost of the assets in the category.
- The average age of the assets in the category, determined by assessing the average age of the components of the assets.
- The information available on the condition of the assets in the category.
- A description of the Townships approach to assessing the condition of the assets in the category, based on recognized and accepted engineering practices where appropriate.

1.4 Levels of Service

The current and proposed Levels of Service (LOS) are described in terms of technical metrics and qualitative descriptions for each asset type. These measures are prescribed for core/non-core assets within O. Reg. 588/17. LOS are presented in Figure 1 and are defined as follows.

- ***Community Levels of Service (CLOS):*** LOS that the organization provides to the community, intended to be customer-focused, providing a qualitative description of scope and quality.
- ***Technical Levels of Service (TLOS):*** LOS that the asset can provide to the Township which is further measured by the performance of the asset, providing technical metrics that support the delivery of LOS.

Figure 1 - Levels of Service



1.5 Asset Management Strategy

Asset Management Strategies need to consider a set of actions that will maintain the Township's assets to meet the proposed level of services. Municipalities can no longer only consider the initial cost of an asset but must identify and consider the full cost of all asset lifecycle activities. The term 'lifecycle activities' encompasses a range of actions that can be conducted throughout an asset's useful life. These activities, as defined by O. Reg. 588/17, include construction, maintenance, renewal, operation, and decommissioning of assets, along with all associated engineering and design work. Additionally, the 'Building Together – Guide for Municipal Asset Management Plans' (issued by the Ministry of Infrastructure) classifies lifecycle activities into several distinct categories: non-infrastructure solutions, maintenance, renewal/rehabilitation,

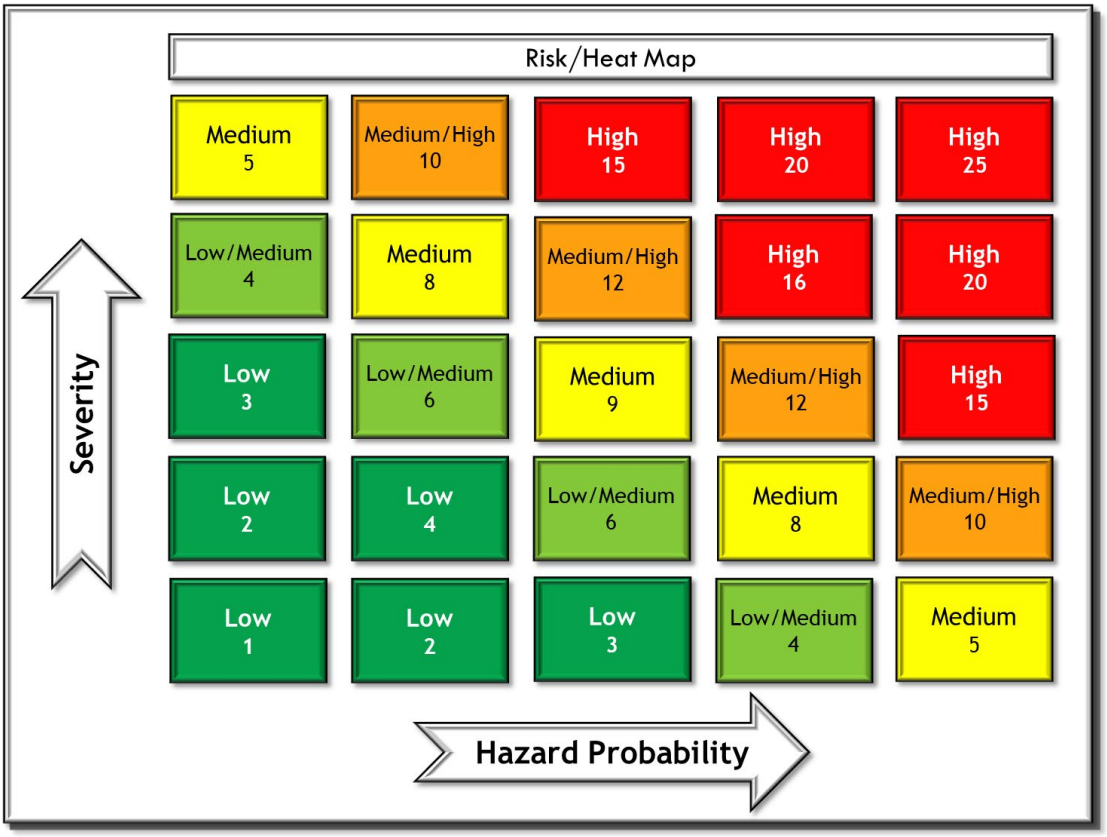
replacement, disposal, and expansion. For each asset category considered within this Asset Management Plan (AMP), specific lifecycle activities have been identified.

In the process of determining lifecycle activities for each asset category and identifying priority actions, it is essential to consider the associated risks. Evaluating the risk rating for each individual asset within the category contributes to generating a comprehensive risk profile for the entire asset category. The assets with the most significant risk rating play a crucial role in determining priorities for the Township. In the process of risk assessment, this methodology considers factors that contribute to the likelihood of hazards occurring (or non-delivery of service) and the associated consequences to go along with.

In the comprehensive risk assessment framework, Township staff have utilized a priority rating system that correlates directly with the calculated risk ratings. This system is visually represented in **Figure 2**, which features a five-by-five matrix.

- ***High Risks** (Red Zones):* These are scenarios with risk ratings falling between 15 and 25. These represent critical vulnerabilities that demand immediate attention. Assets falling into this category require urgent mitigation strategies to prevent service disruptions or adverse impacts.
- ***Medium Risks** (Yellow/Orange Zones):* This zone encompasses risk ratings ranging from 5-12. While these are not severe risks, these situations still warrant initiative-taking management. Assets in this range should be closely monitored, and appropriate measures should be undertaken to reduce the risk profile.
- ***Low Risks** (Green Zones):* Assets with risk ratings between 1 and 6 fall into this category. These are stable and pose minimal threats. However, continuous monitoring and periodic assessments are essential to maintain the favourable risk status.

Figure 2 – Risk Heat Map



The priority rating system serves as a valuable tool for decision-makers, allowing them to allocate resources effectively, prioritize risk mitigation efforts, and ensure the resilience of critical assets.

Risk in the context of asset management, encompasses both the likelihood and magnitude of adverse scenarios or hazards. These risks directly impact an asset's ability to deliver its intended service. When evaluating risk, the Township must consider not only the possibility of asset failure but also the consequences that follow. These consequences involve assessing the severity of the impact, the asset's vulnerability, and its exposure to negative scenarios.

To quantify risk, the Township will employ a methodology that assigns scores based on both probability and severity. On a scale of 1 to 5 for both probability and severity, the Township calculates the risk rating. The maximum risk rating achievable is twenty-five (25), indicating an elevated level of risk. By systematically analyzing risk factors, the

Township can prioritize mitigation efforts and allocate resources effectively to safeguard critical assets and maintain service continuity.

Risk = Likelihood of Occurrence x Consequence

Calculation of Likelihood of Occurrence

The factors that contributed to the likelihood of asset failure include

- ***A*** – Condition of the Asset
- ***B*** – Performance (Reliability)
- ***C*** – Vulnerability to Factors such as Climate Change

In the context of asset management, the separation of condition and performance into distinct factors offers a valuable perspective. By doing so, the Township can carefully evaluate assets that exhibit poor physical condition yet continue to perform effectively, contrasting them with non-performing assets. Additionally, this approach allows the Township to consider well-maintained assets that may lack reliability due to unforeseen issues.

Furthermore, the impact of Climate Change emerges as a critical consideration. Assets susceptible to climate change scenarios such as intense rainfall, rising temperatures, extreme weather events, and prolonged droughts will require special attention. When assessing these assets, it is crucial to incorporate a Climate Change rating, which accounts for any mitigation efforts aimed at reducing risk. To estimate the likelihood of asset failure, there is a combination of three factors (condition, performance, and Climate Change) using a simple average formula:

Likelihood of Asset Failure: (A + B + C) /3

Here, it is assumed equal weighting for each factor. For a more comprehensive understanding, refer to Figure 3 which provides detailed descriptions of these three critical factors.

Figure 3 – Likelihood Factors

Factors	Low (1)	Moderate (3)	High (5)
A - Condition	Very Good (1)	Good (2) or Fair (3)	Poor (4) or Very Poor (5)
B - Performance	Always Reliable	Usually Reliable	Not Reliable
C - Climate Change	No or limited impact, quick recovery or mitigation in place	Limited Impact with slower recovery, mitigation plan not in place	Moderate or high impact, no or limited mitigation plan

Calculation of Consequence

The question to consider when calculating consequence is: *What increases the impact of non-delivery (or failure of the asset)*. The factors that contribute to the consequence rating include.

- ***D*** – Impact or Severity
- ***E*** - Importance of the asset delivering service

Both impact and importance contribute to the consequence and will be multiplied by the likelihood of occurrence. The two ratings are added together for a maximum score of 5. For a detailed breakdown of consequence factors and their descriptions please refer to **Figure 4.** This table provides valuable insights into the nuances of consequence assessment, helping the Township make informed decisions.

Figure 4 – Consequence Factors

Factors	Low	Moderate	High
D – Impact	Low or no impact (0)	Moderate Impact (1)	High Impact (2)
E – Importance of the Asset Delivering Service	Low Importance (1)	Moderate Importance (2)	High Importance (3)

Calculation of Risk

The risk calculation for each of the assets is determined as follows.

Risk = Likelihood of Occurrence x Consequence

Risk = (A + B + C) / 3 * (D + E)

With the following representing,

- ***A*** = Condition
- ***B*** = Performance

- ***C*** = Climate Change
- ***D*** = Impact
- ***E*** = Importance of the Asset

1.6 Financial Strategy

The financial strategy set out in the AMP establishes a plan by which the Township will be able to sustain the lifecycle activities required to maintain the proposed level of service. O. Reg. 588/17 requires a minimum 10-year capital plan. The Township has consistently been reviewing 10-year plans as part of budget and mid-year review processes. The financing strategies within this report focus on maintaining the proposed service levels. Various financing options including reserve funds, debt, grant and tax levy were considered during the process of developing this plan.

1.7 Acknowledgement

The Township of North Dumfries extends its gratitude to Dillon Consulting for their work on “Phase One” of the Asset Management Plan, which focused on the Township’s core assets. Dillon Consulting was instrumental in the development of the state of infrastructure, condition of core assets and lifecycle management related strategies. The work done by Dillion has been updated by Township staff to be included within this version of the AMP. The original report prepared by Dillion Consulting can be viewed on the Township’s website [www.northdumfries.ca]

2. State of Local Infrastructure and Levels of Service

2.1 Road Networks

The Township owns and maintains a road network which includes paved and unpaved road assets, as well as sidewalks and streetlights. The information related to the road assets is based on the Township of North Dumfries Roads State of the Infrastructure Study 2022, completed by Dillon Consulting Limited. This document can be referenced for further information.

2.1.1 Roads

The Township owns and maintains 167.58 km of paved and unpaved road assets. In previously completed road needs studies, the asset inventory was classified as Urban, Semi-Urban, and Rural, with each defined as follows:

a) **Urban:** Roads having curb and gutter and storm sewer drainage

b) **Semi-Urban:** Roads without curb and gutter in built-up urban areas

c) **Rural:** Roads without curb and gutter outside built up urban areas.

Figure 5 - Summary of Road Assets

	Construction Material	Total Lane KM	Average Age (Years)	Replacement Costs (2024$)
Urban	High Class Bituminous (Asphalt)	30.50	18.2	$29,636,171
Semi - Urban	High Class Bituminous (Asphalt)	59.73	24.7	$19,751,024
	Gravel	0.74	23.8	$200,860
Rural	High Class Bituminous (Asphalt)	192.09	23.3	$81,220,784
	Low Class Bituminous (Tar and Chip)	1.20	26.2	$215,986
	Gravel	50.92	20.9	$13,816,401
	Total	335.17	22.2	$144,841,226

The 2024 replacement costs are estimated based on the last calculation from the 2022 costs generated in the State of the Infrastructure Report and inflated by 5% a year. The total replacement cost is estimated to be $144.8 million dollars.

Based on O. Reg. 588/17, the road classifications are:

- ***Arterial Road –*** Class 1 and Class 2 highway,
- ***Collector Road –*** Class 3 and Class 4 highway; and,
- ***Local Road –*** Class 5 and Class 6 highway

These classes of road are determined in the Table under Section 1 of Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) as set out in the *Municipal Act, 2001* based on average daily traffic counts and speed limit. The Township's road network is comprise of collector and local road types. The Township does not have own or operate arterial roads.

The Township has updated its Capital Asset Policy to track the road networks based on component comprised of base and surface. The information is still in progress to split these costs out in the historical database, and thus the AMP uses combined data. For the next full update to the AMP, it is recommended that the inventory assign separate expected useful lives to both the road surface and the road base. This approach will more accurately reflect the operating experience of the road network in the Township. Current data is already being tracked in this manner.

Figure 6 - Average Age of Roads

	Road Classifications	Construction Material	Expected Useful Life (Years)	Average Remaining Useful Life (Years)
Collector	Class 3 and Class 4 Highway	Gravel, High Class Bituminous (Asphalt)	40	18
Local	Class 5 and Class 6 Highway	Gravel, High Class Bituminous (Asphalt), Low Class Bituminous (Tar and Chip)	40	17

2.1.2 Sidewalks

The Township maintains approximately 30,000 m of sidewalks principally within the community of Ayr adjacent to the road network and as walkways. The total length of sidewalk can be categorized by the following:

- 540 m are adjacent to schools,
- 6,290 m are on Regional Roads,
- 1,310 m are adjacent to Township property,
- 285 m are in Centennial Park,
- 340 m are in the Downtown Core; and,
- Remaining 20,605 m on all other Township streets.

It is assumed that the entire sidewalk network consists of concrete segments. Excluding the sidewalk on the Regional Roads (6,920 m) due to a pre-existing agreement with the Region of Waterloo, there is a total of 23,080 m of sidewalk within the Township that, when replaced, would need to be funded by the Township. At an assumed 1.5 m width, this equates to 34,620 m2 of sidewalk.

The replacement cost of each m2 of sidewalk is estimated to $88.20/m2 (2024 dollars). This includes the removals and installation of the concrete surface and granular base. The total estimated replacement cost for all sidewalks that the Township is responsible for funding replacement is **$3,053,484.**

The average age of the existing sidewalk assets within the Township are estimated to be 15 years. The expected useful life of each sidewalk segment within the Township is 40 years for concrete sidewalks.

2.1.3 Streetlights

The Township has a total of 564 streetlights which are comprised of 437 traditional streetlights and 127 decorative streetlights. The majority of the decorative streetlight are located within the Nith River Way neighbourhood, Community of Roseville and the Maple Manor estate subdivision.

The total replacement cost for all the streetlights in the Township in 2024 CAD is **$3,439,850** based on per unit costs of $5,750 for a traditional streetlight and $7,300 for a decorative streetlight.

The expected useful life of traditional streetlight poles is dependent on the material used (80 years for concrete, 70 years for steel, and 30 years for wood). Decorative streetlights have an estimated useful life of 70 years.

The expected useful life of streetlight fixtures and luminaries (traditional or decorative streetlight) is 30 years.

2.1.4 Condition

A road condition assessment was most recently completed by Dillon Consulting Limited in 2022 with results and analysis documented in the Township of North Dumfries Roads State of Infrastructure Study 2022 report. The condition categories used as a part of that study were based on the level of service defined in ASTM manuals relative to the value of the Pavement Condition Index (PCI), as showcased in **Figure 7** below. PCI considers the physical condition of the road (e.g. cracking, potholes) measured by a visual inspection. A new road is assigned a PCI of 100, and over time, as the road ages and through wear and tear, the PCI number drops to 0, which is the worst possible condition.

Figure 7 - Condition Categories

Pavement Condition Index (PCI)	Condition Category
85 to 100	Very Good
70 to 85	Good
55 to 70	Fair
40 to 55	Poor
Less than 40	Very Poor

These values should be considered as guidelines for replacement activities which should also consider other needs in the Township's overall capital program. (For example, roads can be improved in conjunction with adjacent segments for a continuous section, or in consideration of other work being one in the roadway, such as replacement of culverts or pipe).

In reference to guideline SP-024 published in August 1989 by the Ministry of Transportation (Manual for Condition Rating of Flexible Pavements – Distress Manifestations), there are eight categories for flexible pavement ratings as presented in Figure 8. Pavement Condition Rating (PCR) is an assessment of overall pavement performance, both functionally and structurally. It is derived from serviceability based on evaluation of pavement riding comfort and of pavement surface distresses.

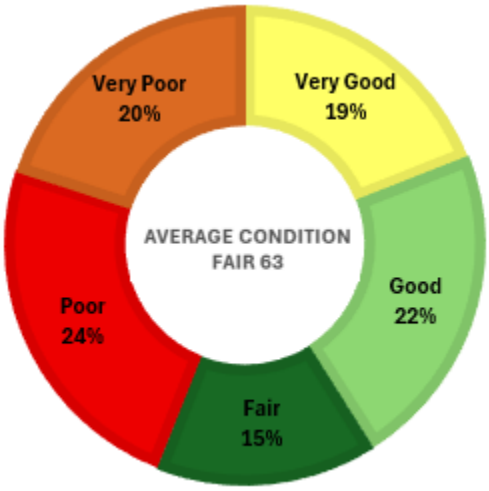
Figure 8 - Pavement Condition Rating

Pavement Condition Rating	Description of Pavement	Rideability Description
90 to 100	Excellent condition with few cracks	Excellent with few areas of slight distortion
75 to 90	Good condition with frequent very slight or slight cracking	Good with few slightly rough and uneven sections
65 to 75	Fairly good condition with slight cracking, slight or very slight dishing and a few areas of slight alligatoring	Fairly good with intermittent rough and uneven sections
50 to 65	Fair condition with intermittent moderate and frequent slight cracking, and with intermittent slight or moderate alligatoring and dishing	Fair and surface is slightly rough and uneven
40 to 50	Poor to fair condition with frequent moderate cracking and dishing, and intermittent moderate alligatoring	Poor to fair and surface is moderately rough and uneven
30 to 40	Poor to fair condition with frequent moderate alligatoring and extensive moderate cracking and dishing	Poor to fair and surface is moderately rough and uneven
20 to 30	Poor condition with moderate alligatoring and extensive severe cracking and dishing	Poor and the surface is very rough and uneven
0 to 20	Poor to very poor condition with extensive sever cracking, alligatoring and dishing	Poor and surface is very rough and uneven

A summary of the Township's overall roadway condition is showcased below in Figure 9. Based on the 2022 roadway evaluations, the average PCI value for the entire road network is 63. This puts the overall road network in the "Fair" category.

Figure 9 - Condition of Road Network

PCI Range	Condition Categories	Length of Road (km)	Percentage of Total Road Network
Greater than 85	Very Good	30.9	19%
70 to 85	Good	37.5	22%
56 to 70	Fair	25.5	15%
40 to 55	Poor	39.7	24%
Less than 40	Very Poor	33.9	20%
	Total	167.5	100%



2.1.5 Road Network Service Levels

Levels of Service (LOS) for road assets are outlined in Table 4 of O. Reg. 588/17. Figure 10 outlines the Township's current Community (CLOS) and Technical (TLOS) Levels of Service for road assets within the Township.

Figure 10 - Community Levels of Service (Roads)

Service Attribute	Community Levels of Service (Qualitative Description)	Community LOS
Scope	Description, which may include maps, of the road network in the Municipality and its level of connectivity.	The roads in the Township are intended to serve local and through traffic in urban and rural settings, throughout the Township. A map of the road network can be found in **Appendix A**.
Quality	Description or images that illustrate the different levels of road class pavement condition.	Pavement condition was assessed in 2022. The road segment surfaces were visually assessed using the TotalPave software and a PCI score which is between 0 and 100 was given to each segment. PCI of 100 is new condition and as the asset ages and the road condition deteriorates, the PCI score gets lower where PCI of 40 is very poor. A map by PCI score can be found in **Appendix A**.

See Figure 11 showcased below for roadway type, length of lane kilometers, and proportion per square kilometer of area.

Figure 11 - Proportion of Lane Kilometres

Street Type	Length of Lane-Kilometers	Lane-Kilometers as Proportion of sq. km of Land Area
Collector	231.4 km	1.2 km per 1 km^2
Local	103.8 km	0.55 km per 1 km^2

Asset performance measures were determined in consultation with Dillon Consulting, which provided relevant metrics against which the Township can gauge the performance of the assets. The performance measures for roads, and their current values are showcased in Figure 12.

Figure 12 - Road Performance Measures

Asset Performance Measures	Current Value
Roads with load restrictions	Seasonal road restrictions across the entire Township
Percentage of roads in Fair or Better condition	53%

The Township has a proposed service level of maintaining roads at an average PCI of 65.

2.2 Bridges and Culverts

2.2.1 State of the Infrastructure

The Township owns five (5) bridges and fourteen (14) structural culverts, for a total of eighteen (18) structures (The Nithvale Bridge is closed to vehicle and pedestrian access with no timeline/plans for restoration/rehabilitation to accommodate pedestrian access).

The inventory of structures are shown below in Figure 13 and Figure 14, including the structure type and name of structure. Bridges and structural culverts are defined as structures providing vehicle or pedestrian passage across an obstruction, gap, or facility that are greater than or equal to 3 metres in span.

Figure 13 - Inventory of Bridges

Structure Type	Quantity	Structure Name
Slab on I-Girder (Steel)	2	Footbridge Road Bridge Shellard Road Bridge
Solid Slab	1	Jedburgh Dam Bridge
Rectangular Voided Slab	1	Piper Street Bridge
Pratt style through truss	1	Nithvale Bridge
TOTAL	**5**	-

Figure 14 – Inventory of Structural Culverts

Structure Type	Quantity	Structure Name
Corrugated steel plate pipe arch	9	Alps Twin Culvert Industrial Road Culvert Kings Road Twin Culvert Reidsville Twin Culvert Sheffield Rd Twin Culvert 2 West Alps Road Twin Culvert Sheffield Rd Three-Cell Culvert 1 GreenField Road Twin Culvert GreenField Road West Twin Culvert
Concrete Rigid Frame	3	Morrison Culvert 1
		Morrison Culvert 2
		Gore Culvert 1
CSP/Concrete Rigid Frame	1	Clyde Road Culvert
Reinforced Concrete Elliptical	1	Gore Culvert 2
TOTAL	**14**	-

The total replacement cost of the majority of the roadway bridges and structural culverts is based on the 2024 OSIM Report which details the replacement values for each structure. The Nithvale Bridge was not included in the 2024 OSIM report, but a separate inspection and report was prepared by Jewell Engineering Inc. in March 2022.

The OSIM report identifies the elements of each structure and the corresponding replacement value for each element. The total replacement value for each bridge and structural culvert was determined to be $41.6 million with the total replacement cost summarized for each structure type which is highlighted below in Figure 15.

Figure 15 – Replacement Costs for Bridges & Structured Culverts

	Quantity	Total Replacement Costs
Bridges	5	$ 39,301,114
Structured Culverts	14	$ 2,344,319
Total	19	$ 41,645,433

The bridge network varies in age distribution from 52 years (constructed in 1970) to 139 years (constructed in 1883) and has an average age of 82 years old. There was no known age or year of construction information available for the structural culvert network. The age distribution for the bridges is shown in Figure 16 below.

Figure 16 - Age Distribution of Bridges

	Year Constructed	Age (Years)
Footbridge Road	1970	55
Jedburgh Dam	1940	85
Piper Street	1967	58
Shellard Road	1940	85
Nithvale	1883	142

The Township has previously undertaken condition assessment for bridge and structural culvert assets, determined through completion of OSIM inspections, the most recent having been completed in 2022 by MEDA Engineering and Technical Services. As mentioned previously, inspection of the Nithvale Bridge was not included in the 2024 OSIM report, but the bridge was inspected separately by Jewell Engineering Inc. in March 2022.

The OSIM provides an overall element condition index that quantifies the elements condition on a scale of 0-100, where 100 is the best and 0 is the worst. The average condition of all elements for a structure is used to determine an overall Bridge Condition Index (BCI). The Ontario Ministry of Transportation (MTO) has developed a general categorization for BCI values, as summarized below in Figure 17.

Figure 17 – Bridge Condition Index

Condition State	BCI
Good	71 to 100
Fair	60 to 70
Poor	Less than 59

Figure 18 and Figure 19 below summarize the BCI values for each bridge and structural culvert, and the corresponding qualitative condition. The average BCI for the four

bridges is 67.5 (fair), and the average of the BCI for the fourteen structural culverts is 68.7 fair.

A BCI value was not determined for the Nithvale Bridge during the most recent OSIM inspection due to it currently being closed. A BCI of 0 is assumed based on information provided by the Township. Due to the severe corrosion of the steel members, it was recommended by Jewell Engineering Inc. that the bridge remain closed in its current condition.

Figure 18 - Bridge Condition Summary

	BCI	Rating
Footbridge Road	66.0	Fair
Jedburgh Dam	48.6	Poor
Piper Street	69.9	Fair
Shellard Road	73.8	Good
Nithvale	-	Poor
Average BCI	51.7	Poor

Figure 19 - Structural Culvert Condition Summary

	BCI	Rating
Alps Twin Culvert	60.2	Fair
Industrial Road Culvert	71.2	Good
Kings Road Culvert	72.3	Good
Morrison #1	70.2	Good
Morrison #2	69.4	Fair
Reidsville Twin Culvert	72.3	Good
Sheffield Twin Ciuvert	70.1	Good
West Alps Road Twin Culvert	65.5	Fair
Sheffield Three-Cell Culvert	68.3	Fair
Clyde Road Culvert	69	Fair
Greenfield Road Twin Culvert	61.2	Fair
Greenfield Road West Twin Culvert	62	Fair
Gore 1	65	Fair
Gore 2	69.1	Fair
Average BCI	68.1	Fair

2.2.2 Level of Service

Levels of Service for bridges and culverts are outlined in Table 5 of *O. Reg. 588/17.* Table 29 and Figure 20 outline the Township's current community and technical levels of service for bridges and culverts.

Figure 20 - Community Levels of Service (Bridges and Culverts)

Service Attribute	Community Levels of Service (Qualitative Description)	Community LOS
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	The Township's bridge and structural culvert network is designed to support various vehicle types, including: • Heavy transport vehicles • Motor vehicles • Emergency vehicles • Agricultural vehicles and equipment • Pedestrians • Cyclists
Quality	Description or images of the condition of bridges and how this would affect use of the bridges.	The condition of bridges and culverts are evaluated routinely (every two years) according to the OSIM requirements. For full descriptions and samples images of bridge and culvert condition classifications refer to the Ministry of Transportation's *Ontario Structure Inspection Manual 2008 and Field Inspection Guide* (April 2008). Bridges and culverts in Good condition typically operate as designed and would not receive any additional restrictions or limitations beyond those designed. Bridges and culverts in Fair to Poor condition may receive load restrictions or be subject to closure as deterioration affects asset capacity to safely and reliably deliver the designed level of service.
Quality	Description or images of the condition of culverts and how this would affect use of the culverts.	

Figure 21 - Technical Levels of Service (Bridges and Culverts)

Service Attribute	Technical Levels of Service (Technical Metrics)	Technical LOS
Scope	Percentage of bridges in the Municipality with loading or dimensional restrictions.	An OSIM bridge inspection report conducted in 2022 by MEDA Engineering and Technical Services identified one bridge that are posted with loading restrictions. This represents 5% of the total 19 bridges and culverts in the network. The 2022 report included the Jedburgh Dam Bridge with a posted loading restriction load restriction of 10 tonnes. In addition, the Nithvale Bridge is also currently closed.
Quality	For bridges in the Municipality, the average bridge condition index value.	The latest bridge condition index (BCI) value for the bridge network is based on 2022 inspections. The average index across the bridge network is 54, Poor.
Quality	For structural culverts in the Municipality, the average bridge condition index value.	The latest bridge condition index (BCI) value for the structural culvert network is based on 2022 inspections. The average index across the culvert network is 68.7, Fair.

Asset performance measures were determined in consultation with the Township, which provide relevant metrics against which the Township can gauge the performance of their assets. The performance measures bridge and culvert assets and their current values shown in **Figure 22**.

Figure 22 - Bridge and Culvert Performance Measures

Asset Performance Measures	Current Value
Annual average daily traffic (AADT) counts over bridges to assess usage	Footbridge Road Bridge – 2,500 Jedburgh Dam Bridge – 1,300 Piper Street Bridge – 2,000 Shellard Road Bridge – 3,800 Nithvale Bridge – 0
Number of bridge or culvert failures/road closures	0
Number of structures with load restrictions	1
Percentage of bridges and culverts in Fair or better condition	60% of Bridges and 100% of Culverts

2.3 Stormwater Assets

2.3.1 State of Infrastructure

The Township owns and maintains a stormwater system which includes a linear storm sewer network, catch basins, manholes and stormwater management facilities. A summary of the quantity of linear storm assets and appurtenances is provided below in Figure 23.

Figure 23 - Inventory of Linear Stormwater Assets

Asset Type	Quantity of Assets	Unit of Measure
Storm Sewer Mains	11,143	Length (m)
Storm Sewer Manholes	150	Quantity
Storm Sewer Catch Basins	625	Quantity

In addition, there are nine stormwater management (SWM) facilities that are currently assumed by the Township. A further breakdown of these SWM facilities and their location is provided below in Figure 24.

Figure 24 - Inventory of Stormwater

Facility ID	Facility Name	Facility Type	Catchment Area (ha)	Location
A	Main Street SWM Pond	Dry Pond	5	201 Main Street
B	Hunt St SWM Pond	Wet Pond	9	19 Hunt Street
C	Robert Simone SWM Pond	Wet Pond	8.6	37 Robert Simone Way
D	Vincent Drive SWM Pond	Wet Pond/ Wetland	61.1	248 Vincent Drive
E	Jenkings SWM Pond	Wet Pond	8.4	23 Jenkings Court
F	Wanless SWM Pond	Dry Pond	40.5	Behind 120 Wanless Court
G	Waydom SWM Pond	Dry Pond	42.1	Rear of 420/500 Waydom Drive
H	Earl Thompson SWM Pond	Dry Pond	17.5	105 Earl Thompson Road
I	Darrell Pond	Dry Pond	40.5	132 Earl Thompson Road

Figure 25 - Replacement Unit Costs for Storm Sewers

Pipe Diameter (mm)	Pipe Material	Replacement Unit Cost ($/Metre)
< 250	PVC	$1,400
250 - 500	PVC	$1,600
500 - 1000	Concrete	$2,400

Figure 26 provides a total estimated replacement cost for the linear storm sewer network including appurtenances. The total estimated replacement cost is $20.8 million.

Figure 26 - Replacement Unit Costs for Storm Sewer Including Appurtenances

Pipe Diameter (mm)	Total Pipe Length (m)	Total Replacement Cost
< 250	178	$249,200
250 - 500	7,138	$11,420,800
500 - 1000	3,827	$9,184,800
Total	11,143	$20,854,800

The replacement cost of the stormwater management facilities is estimated at $8,393,600. This assumes of a unit cost of $34,000 per hectare of drainage area, in reference to a unit cost provided in the City of Barrie's 2020 Stormwater Asset Management Plan inflated to 2024 Dollars assuming a 3% average annual inflation. The total drainage area serviced by the Township's nine stormwater management facilities is 232.7 ha. There is limited available information related to the age of the storm sewers. As such, it is assumed that the storm sewers are the same age as the roadway which they are installed within. Based on this assumption, the average age of the storm sewer mains by linear metre is 18.5 years. It is assumed that the manholes and catch basins were installed at the same time as the storm sewer mains and are of a similar average age. The average age of the existing stormwater management facilities is estimated to be approximately 30 years old.

A summary of the average condition of stormwater management linear assets, weighted by length of pipe, is included in Figure 27. The condition is reported on a scale of 0 to 100, where 100 represents an asset in new condition. The average condition of all linear stormwater assets (by length) is "Very Good."

Figure 27 - Average Condition

Pipe Material	Total Length (m)	Average Condition Score	Average Condition Rating
Concrete	3,827	99.2	Very Good
PVC	7,316	97.9	Very Good
Total	**11,143**	**98.3**	**Very Good**

The condition results summarized in Figure 29. The scoring system evaluates each facility with the lower score indicative of fewer issues. Under the assumption that each criterion is weighted equally, an average condition score has been calculated with all nine facilities with an average score of 3.1 (Attention Required).

Figure 28 - Condition Rating System of SWM Facilities

Condition Rating	Description
1	Excellent (the component has no deterioration)
2	Satisfactory (some wear is noticed, but does not affect the functionality of the component)
3	Attention Required (the component is still functioning but has minor problems that may prevent the component from functioning properly during extreme events – some simple upkeep is required)
4	Non-Functional (the component is no longer functioning as designed)
5	Non-functional and deterioration, but not causing a safety hazard
6	Safety Hazard (the component presents a safety hazard either because it allows access to restricted areas, e.g. a grate on a pipe is not secure, or the component is structurally unsound e.g. erosion of the access road).
N/A	Not observed or does not exist

The results of the condition assessments identify that several of the stormwater facilities require operation and maintenance activities, including sediment removal and vegetation maintenance. Not addressing this backlog of maintenance activities will result in poor water quality and failure to meet regulatory requirements. The Jenkings SWM facility, which scored the highest overall condition score of 3.5, is being cleaned out in 2026.

Figure 29 - SWM Facilities Condition Summary

Criteria	SWM Facility Condition Score								
	A	B	C	D	E	F	G	H	I
General facility appearance	3	3	3	3	3	3	3	2	2
Inlet and outlet structures	3	4	2	3	5	3	3	2	4
Low flow channels	N/A	N/A	2	3	5	N/A	N/A	N/A	5
Emergency overland spillway	4	2	2	3	5	3	3	3	4
Vegetation	5	5	5	5	2	5	5	2	3
Access road and walkway	5	5	5	5	3	4	4	3	3
Perimeter fencing	3	3	3	3	3	4	4	2	N/A
Presence of erosion, unsafe conditions, nuisance issues, encroachments, poor water quality, etc.	3	3	2	2	3	3	3	2	2
Sediment accumulation	4	4	2	3	5	5	5	2	2
Public safety	1	1	1	1	1	1	1	1	1
Total Condition Rating Score	31	30	27	31	35	31	31	19	26
Overall Average Condition	**3.4**	**3.3**	**2.7**	**3.1**	**3.5**	**3.4**	**3.4**	**3.1**	**2.9**

2.3.2 Level of Service

Levels of service for stormwater assets are outlined in Table 3 of the regulation, O. Reg. 588/17. Figure 30 and Figure 31 outline the Township's current community and technical levels of service for stormwater assets.

Figure 30 - Community Levels of Service Stormwater Management

Service Attribute	Community Levels of Service (Qualitative Description)	Community LOS
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.	The stormwater management system in the Municipality is devised of a pipe network and drains, which provide conveyance of stormwater from roadways. The extents of the network are shown in **Appendix A**.

Figure 31 - Technical Levels of Service Stormwater Management

Service Attribute	Technical Levels of Service (Technical Metrics)	Technical LOS
Scope	Percentage of properties in municipality resilient to a 100-year storm.	Approximately 24% of the Ayr Urban Area is resilient to a 100-year storm. This is equivalent to approximately 10% of the properties in the Township.
Scope	Percentage of the municipal stormwater management system resilient to a 5-year storm.	Approximately 24% of the Ayr Urban Area is resilient to a 5-year storm. This is equivalent to approximately 10% of the properties in the Township.

Asset performance measures were determined in consultation with Staff, which provide relevant metrics against which the Township can gauge the performance of their assets. The performance measures for stormwater management assets and their current values are shown in Figure 32 below.

Figure 32 - Stormwater Management Performance Measures

Asset Performance Measures	Current Value
Percentage of the Ayr community with stormwater quality and quantity control	Currently approximately 24% of the area in the Ayr Urban Area has quality and quantity control. This value with continue to increase as the Township undertakes road construction to implement SWM facilities.
Inspection frequency of stormwater ponds and catch basins	Annual inspection (initiated in 2021)

2.4 Facilities

2.4.1 State of Infrastructure

The Township owns and maintains a variety of facilities that support the services provided by the municipality. The Township owns eight (8) facilities with an estimated replacement cost of $51.3 million dollars.

The Township leases office space for the Town Hall Administration. The replacement cost for the Town Hall has not been included within this report as the Township is not responsible for the maintenance of the facility. The leasehold improvements previously

done included space for future operational needs and therefore no further improvements are anticipated to be required during the life of the lease.

Although the Township owns the building in which the library occupies, the Region of Waterloo is responsible for the delivery of library programs and services. The Township is however responsible for the lifecycle replacement and renewal of the major building components (ie: roof, exterior doors & windows, exterior cladding, HVAC, electrical and plumbing, parking lot, etc).

The replacement costs for the buildings owned by the Township come from a 2023 Building Condition Assessment (BCA) that was conducted by Cion Corporation in partnership with the Township and then indexed by the NRBCI rate. The full BCA reports can be found on the Township website [www.northdumfries.ca].

As part of the comprehensive Building Condition Assessment (BCA) conducted by Cion Corporation, a Facility Condition Index (FCI) was established. The FCI serves as a standard benchmark in facility management, providing an objective assessment of the current and projected condition of building assets. The Facility Condition Index (FCI) is calculated using the following formula.

FCI = *Repair and Replacement of Deficiencies / Current Replacement Value*

The resulting FCI percentages fall into specific ranges, that are displayed below.

Figure 33 – FCI Percentages

Condition State	FCI
Very Good	0%
Good	0.1% to 5%
Fair	5% to 10%
Poor	10% to 30%
Very Poor	> 30%

Figure 34 – Summary of Buildings, Replacement Costs and FCI Ratings

	Replacement Cost (2024 dollars)	FCI	Rating
Fire Hall	$ 3,872,245	4.6	Good
Public Works - Vehicle Building	$ 3,623,867	9.9	Fair
Public Works - Administrative Building	$ 1,818,000	0	Very Good
Public Works - Sand Dome	$ 955,000	1.5	Good
Ayr Community Center	$ 8,441,654	28.3	Poor
North Dumfries Community Center	$ 22,780,420	1.7	Good
Roseville Community Center	$ 1,771,159	2.5	Good
Library	$ 8,044,462	1.9	Good
Total Replacement Cost	$ 51,306,807	6.3	Average Rating Fair

The new administrative building for public works was assessed at very good as it was constructed in 2024.

2.4.2 Level of Service

The Levels of Service (LOS) framework encompasses both community/customer-level service (CLOS) and technical-level service (TLOS). These distinct service levels provide guidance for specific services, serving as benchmarks against which performance is evaluated. In the context of township management, Figures 35 and 36 highlight the community/customer and technical levels of service, ensuring that service delivery aligns with established standards. Levels of Service guide decision making, optimize resource allocation, and help contribute to a thriving community by ensuring well-maintained infrastructure and responsive services on both a technical and community/customer level.

Figure 35 –Facility Customer/Community LOS

Service Attribute	Community Level of Service
Quality	The Township strives to maintain facilities in a reliable state of repair
Functional	The Township provides facilities that are clean, safe and available for use.

Figure 36 –Facility Technical LOS

Service Attribute	Technical Level of Service	Current Level of Service	Proposed Level of Service
Quality	Average weighted condition assessment based on FCI	Fair	Fair
Functional	Number of facilities with security cameras	63%	63%
Functional	Monthly Health and Safety Inspections occur with any found issues being addressed within a reasonable time.	100%	100%

2.5 Parks and Amenities

2.5.1 State of Infrastructure

The Township of North Dumfries boasts an extensive park system. The system encompasses trail networks through urban settings and natural areas as well as active parks and related amenities. The Township's parks contain a wide variety of amenities including washroom facilities, spray pads, tennis/pickleball courts, a skate park, ball diamonds, soccer fields and playgrounds.

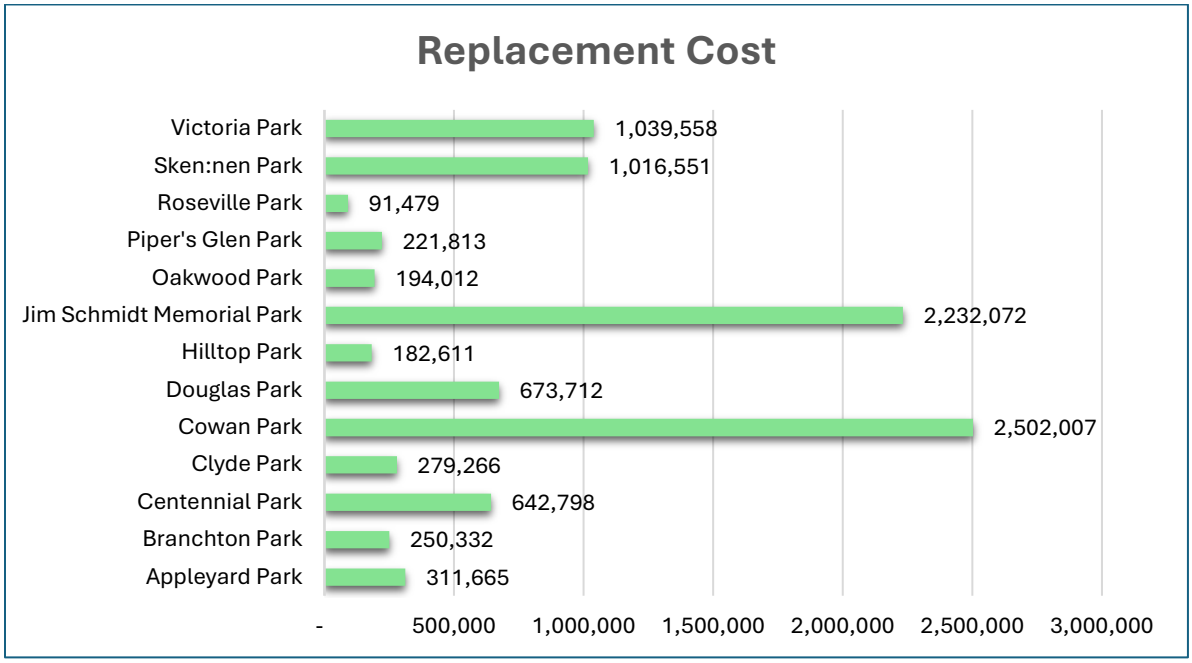
The Township's parks include Victoria Park, Centennial Park, Jim Schmidt Memorial Park, Branchton Park, Clyde Park, Cowan Park, Appleyard Park, Skén:nen Park, Oakwoods Park, Roseville Park, Hilltop Park, Douglas Park, and Piper's Glen Park. Figure 37 displayed below highlights all park assets within the Township of North Dumfries and displays what each park has to offer to Township residents

Figure 37 – Park Assets within the Township

Township Park	Park Assets
Victoria Park – 75 Rose Street	2 Tennis/Pickleball Courts (Lit), 2 Baseball Diamonds (Lit), Playground Equipment, Pavilion & Washrooms
Centennial Park – 31 Northumberland Street	Pavilion Building, Lit Pedestrian Trail, Pedestrian Bridge, Adjacent to Municipal Parking Lot.
Jim Schmidt Memorial Park – 53 Hilltop Drive	3 Tennis/Pickleball Courts (Lit), 2 Baseball Diamonds (Lit), Pavilion, Playground Equipment, Washroom Building, Walking Trail, Shade Structure
Branchton Park – 30 Mary Street	Playground Equipment, Pavilion, Soccer Field, Baseball Diamond
Clyde Park – 1220 Village Road	Playground Equipment, Pavilion, Baseball Diamond, Soccer Field, Basketball Court, Outdoor Fitness Equipment.
Cowan Park – 2958 Greenfield Road	Playground Equipment, Pavilion, 4 Soccer Fields (1 Lit), 3 Beach Volleyball Courts, Skatepark, Outdoor Fitness Equipment, Spray/Splash Pad, Washroom Complex, Walking Trail, Community Garden
Appleyard Park – 23 Challenger Drive	Playground Equipment, Multipurpose Half Court, Shade Structure
Skén:nen Park – 271 Robert Woolner Street	Playground Equipment, Multipurpose Court, Shade Structure, Splash Pad, Junior Baseball Diamond
Browns Park – 24 Oakwood Drive	Playgroup Equipment, Soccer Field, Walking Trail
Roseville Park – 3195 Roseville Road	Basketball Court, Junior Baseball Diamond, Soccer Field, Playground Equipment
Hilltop Park – 153 Hilltop Drive	Playground Equipment
Douglas Park – 39 Douglas Drive	Playground Equipment
Piper's Glen Park – 86 Nith River Way	Playground Equipment, Baseball Diamond, Soccer Field

The replacement costs for the park and land improvements within the Township are derived from a 2023 BCA that was conducted by Cion Corporation. Figure 38 as presented below highlights the park assets owned by the Township, and the respective replacement cost for each asset. Six of the Township's parks were included within the BCA study. Two parks were constructed in 2024 and thus have current values that are appropriate to use as replacement costs. The remaining five parks have estimated replacement costs based on historical values and inflation rates. Total Replacement costs for the Township parks and amenities is approximately $9.4 million dollars.

Figure 38 – Replacement Cost of Park Assets



It should be noted that Oakwoods Park is undergoing rehabilitation in 2025 which has not been reflected in this version of the AMP.

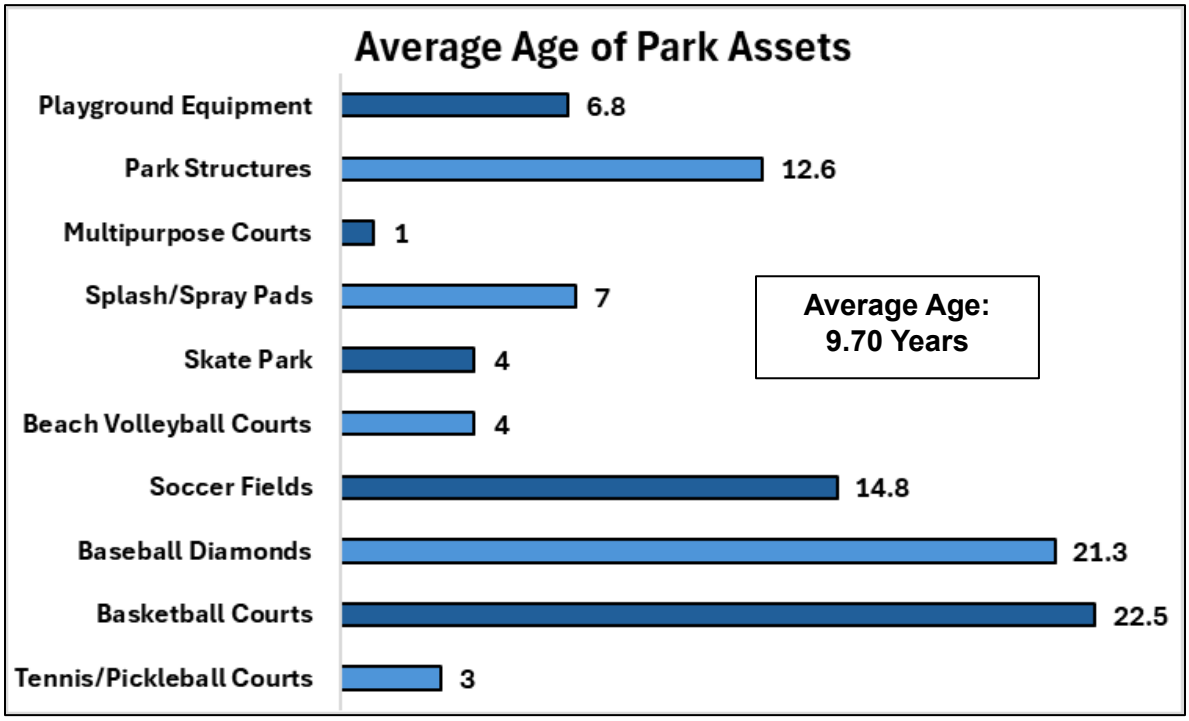
Figure 39 displayed below presents the overall Facility Condition Index (FCI) for each respective park asset, along with its corresponding FCI percentage and a rating that spans from “good” to “critical.” Additionally, the table highlights the average Facility Condition Index (FCI) across all Township of North Dumfries Park assets. It should be noted that since the 2023 BCA rating study was completed, upgrades and repair work was undertaken at Victoria Park. This results in an improvement to the FCI Percentage and related Rate. The chart below reflects the improvement.

Figure 39 – Parks Condition Index

Park	FCI Percentage	Rating
Cowan Park	1.0%	Good
Branchton Park	12.5%	Poor
Centennial Park	15.1%	Poor
Clyde Park	0.5%	Good
Schmidt Park	1.3%	Good
Victoria Park	1.5%	Good
Appleyard Park	0.0%	Good
Skén:nen Park	0.0%	Good
Oakwood Park	4.8%	Good
Roseville Park	5.4%	Fair
Hilltop Park	3.6%	Good
Douglas Park	2.2%	Good
Piper's Glen Park	1.9%	Good
Average Ratings	**3.8%**	**Good**

The determination of the estimated useful life for Township Park assets involves a judicious blend of established industry standards and the expertise of Township staff. Regular reviews of the estimated useful life are essential. These assessments ensure alignment with the observed service duration for each asset type. If necessary, adjustments are made to optimize asset management practices. As depicted in Figure 40 below, which highlights the average age of all park assets.

Figure 40 – Average Age of Park Assets



2.5.2 Level of Service

The Level of Service (LOS) framework encompasses two distinct but interconnected dimensions: community/customer-level service (CLOS) and technical-level service (TLOS). These service levels serve as essential benchmarks, guiding the delivery of specific services within the context of township management. By adhering to these Levels of Service, the Township makes informed decisions, allocates resources effectively, and contributes to a thriving community. The Township's commitment extends to maintaining well-functioning infrastructure and providing responsive services at both the technical and community/customer levels.

In Figures 41 and 42, displayed below it highlights both the community/customer and technical LOS for Township parks, and the assets occupying the park space. These tables serve as reference points, allowing the Township to gauge overall performance against a predefined criterion. When the delivery of Township services aligns with established industry standards, it creates a balance between community satisfaction and technical excellence. The LOS framework is not purely a set of guidelines, it is a

compass guiding the Township towards a vibrant, resilient, and interconnected community.

Figure 41 – Park Assets Community/Customer LOS

Service Attribute	Community Level of Service
Quality	The Township strives to maintain the parks and amenities in a reliable state of repair
Functional	The Township provides parks that are clean, safe and available for everyone to use.
Capacity	The Township strives to maintain the capacity of parks and amenities.

Figure 42 – Park Assets Technical LOS

Service Attribute	Technical Level of Service	Current Level of Service	Proposed Level of Service
Quality	Average weighted condition assessment based on FCI	Good	Good
Functional	Frequency of garbage cleanup (May to October) - Urban Parks - 3 times per week - Rural Parks - once per week	100%	100%
Functional	Frequency of grass cutting (May to October) - Once per Week	100%	100%
Functional	Percentage of playgrounds that passed the most recent Compliance, Safety, Accountability (CSA) safety inspection.	100%	100%
Functional	Number of Parks that contain one or more features that complies with Accessibility for Ontarians with Disabilities Act	92%	100%
Capacity	Number of Hectares of parkland per 1,000 residents	2.40	2.40

2.6 Rolling Stock

2.6.1 State of Infrastructure

The Township manages a diverse fleet of rolling stock, approximately forty-eight (48) “vehicles” with an estimated replacement value of approximately $12.2 million dollars. The fleet ranges from small passenger vehicles to heavy equipment for snow removal. There are also specialized items such as fire trucks and ice resurfacers. Forty-one (41%) percent of the replacement costs relates to the Fire Department. Forty-nine (49%) percent of the replacement costs relates to the Public Works Departments. The Township has been witnessing large increases in market price regarding the cost of fire trucks and large equipment such as graders and tandem axle dump trucks.

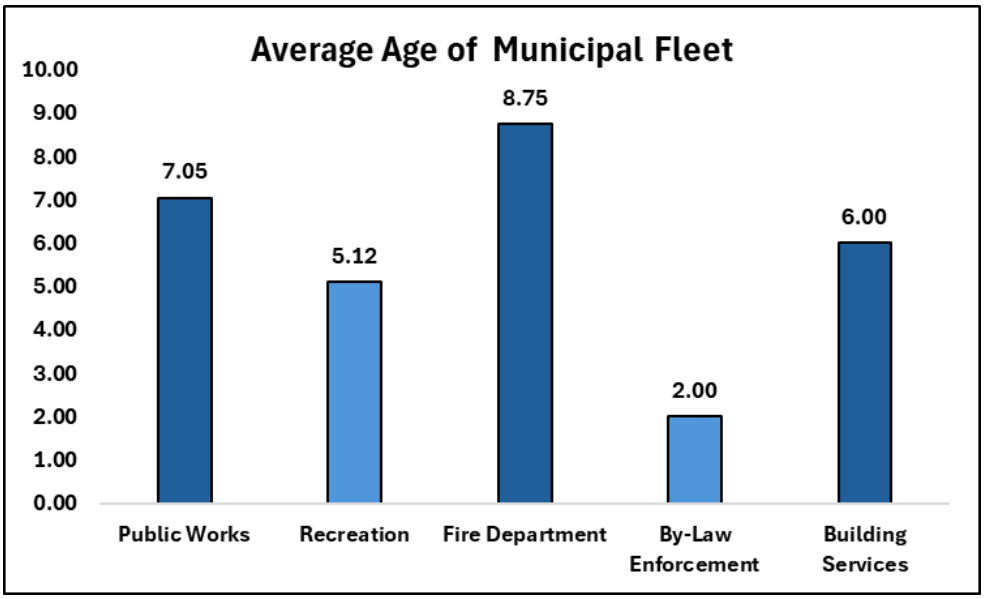
Figure 43 – Fleet Replacement Cost by Department

Department	Quantity	Total Replacement Cost
By - Law	1	$55,713
Building	2	$111,427
Fire	8	$5,060,048
Public Works	19	$5,940,724
Recreation	18	$1,054,133
Total Replacement Cost		**$12,222,046**

The Township does not possess a condition assessment for its rolling stock. Instead a modified age based methodology was used for this version of the AMP. This method implies a lower confidence in understanding the true condition of each asset. All Fire

Apparatus are assessed at good condition, due to the regular maintenance and inspection / certification program. Public Works large equipment are assessed at fair condition. Passenger vehicles have been assessed at fair to good condition dependent upon the age of the vehicle.

Figure 44 – Average Age of Municipal Fleet



2.6.2 Level of Service

The Levels of Service (LOS) consists of both a community/customer level of service (CLOS), and a technical level of service (TLOS). These service levels are a direction for a particular service which the performance will be measured. The community and technical levels of service are highlighted below in Figures 45 and 46.

Figure 45 – Rolling Stock Customer Levels of Service

Service Attribute	Community Level of Service
Quality	The Township strives to ensure that its rolling stock function as intended.
Reliability	The Township strives to minimize failures of its rolling stock such that items are available as required.
Sustainability	The Township is in the process of converting its rolling stock to hybrid or electric alternatives where possible.

Figure 46 – Rolling Stock Technical Levels of Service

Service Attribute	Technical Level of Service	Current Level of Service	Proposed Level of Service
Quality	Percentage of vehicles with assessed conditions of fair or better	83%	90%
Reliability	% of inspections completed, as required under the Highway Traffic Act	100%	100%
Reliability	% of Fire Trucks that are less than 20 years	100%	100%
Sustainability	Number of vehicles using hybrid or electric technology	3	11

2.7 Equipment and Other Assets

2.7.1 State of Infrastructure

In the meticulous evaluation of the Township's non-core assets, staff encountered a diverse array of IT-equipment, smaller-scale tools and equipment, machinery, and other assets. These unassuming components often stored in utility closets or maintenance sheds play an indispensable role in the seamless functioning of the community. While they might not command the spotlight like major infrastructure projects, the significance of these assets cannot be overstated. IT-Assets play a large role in the services provided by the Township from computers, to in the field devices, IT equipment is crucial to a well functioning municipality.

Figure 47 – Non-core Assets Replacement Costs by Department

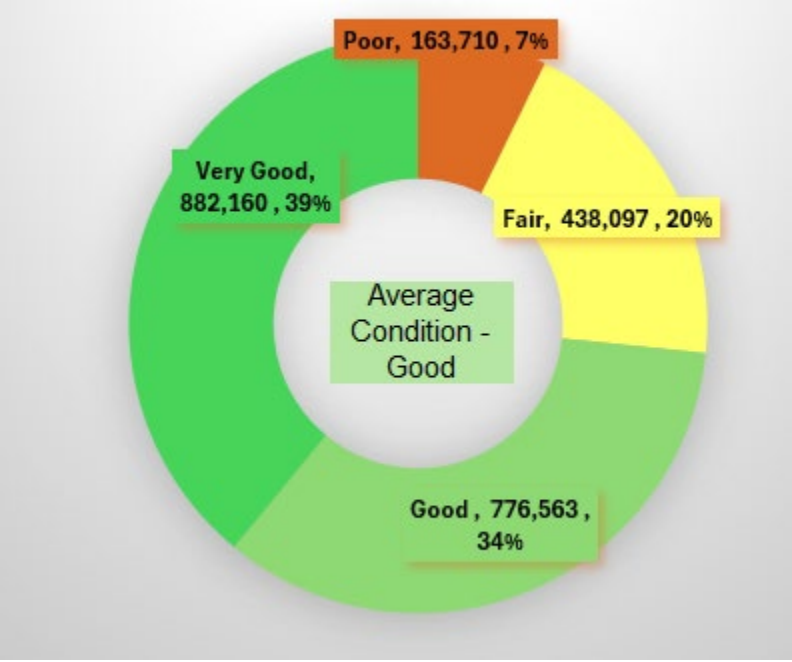
	Replacement Cost
Recreation	$321,161
Public Works	$314,936
Fire	$887,671
Other	$736,763
Total Replacement Costs	$2,260,551

The condition of the Township's equipment was assessed by staff on the basis of percentage of remaining useful life of the asset. Conditions were assigned based on percentage of remaining useful life from Very Good to Very Poor. The following table sets out the criteria for assessment.

Figure 48 – Condition State

Condition State	Percentage of Remaining Useful Life
Very Good	80% - 100%
Good	60% - 80%
Fair	40% - 60%
Poor	20% - 40%
Very Poor	Less than 20%

Figure 49 – Condition State Pie Chart



2.7.2 Level of Service

The Levels of Service (LOS) framework encompasses two distinct but interconnected dimensions: community/customer-level service (CLOS) and technical-level service (TLOS). These service levels serve as essential benchmarks, guiding the delivery of

specific services within the context of township management. By adhering to these Levels of Service, the Township makes informed decisions, allocates resources effectively, and contributes to a thriving community. The Township's commitment extends to maintaining well-functioning infrastructure and providing responsive services at both the technical and community/customer levels. In Figures 50 and 51, displayed below it highlights both the community/customer and technical LOS for Township equipment and other assets.

Figure 50 – Equipment and Other Assets Community/Customer LOS

Service Attribute	Community Level of Service
Quality	The Township strives to ensure that its equipment function as intended.
Reliability	The Township strives to minimize failures of its equipment such that items are available as required.

Figure 51 – Equipment and Other Assets Technical LOS

Service Attribute	Technical Level of Service	Current Level of Service	Proposed Level of Service
Quality	Percentage of equipment with assessed conditions of fair or better	93%	90%
Reliability	IT - Equipment - Server uptime as a percentage	99%	99%

3. Asset Lifecycle Management Strategy

This Section sets out an action plan that will assist the Township in maintaining assets to meet the proposed level of service objectives as set out in Section 2 of the AMP. Lifecycle management strategies identify the specific activities that should be performed on an asset in order to ensure it is performing at an appropriate level and/or to extend its service life.

Lifecycle activities, as defined by O. Reg. 588/17, include construction, maintenance, renewal, operation, and decommissioning of assets, along with all associated engineering and design work. Additionally, the 'Building Together – Guide for Municipal Asset Management Plans' (issued by the Ministry of Infrastructure) classifies lifecycle activities into several distinct categories: non-infrastructure solutions, maintenance, renewal/rehabilitation, replacement, disposal, and expansion. For each asset category considered within this Asset Management Plan (AMP), specific lifecycle activities have been identified. The Township has historically undertaken all the activities listed within the lifecycle activities to various degrees based on asset type. Non-infrastructure solutions and maintenance activities have been funded within the operating budget. Renewal/Rehabilitation, replacement, disposal and expansion activities have been included in the capital budget.

The AMP sets out the cost of required activities over the next 10-years for each lifecycle activity. Also included in this section is a risk analysis, which outlines a summary of assets that can be prioritized for repair/replacement if needed.

3.1 Impact of Growth

Growth in population is expected to result in incremental service demands that may impact both current and proposed levels of service. The Township of North Dumfries population as set out in the 2021 Census was 10,619, which places the Township in the "less than 25,000" as established in O. Reg. 588/17. In reference to the Region of Waterloo Official Plan in October 2024, the population and employment forecasts for the Township are as follows:

- As of 2024, the Township had approximately 11,300 residents and the Township should plan to accommodate 19,600 residents by year end 2051.
- As of 2024, the Township had an employment population of 7,000 and the Township should plan to accommodate an employment population of 12,200 by year end 2051.

Growth-related assumptions and its impact on the lifecycle of both the core and non-core assets are outlined in Figure 52.

Figure 52 – Growth

Asset Category	Growth Impact Assumptions	How Assumptions Relate to Lifecycle of Assets
Road Network	Increased in traffic resulting from new developments	Potential to increase in road maintenance costs, changes in road classifications may require upgrades to assets
Bridges & Culverts	Increased usage of bridge crossings by vehicles in the area	Potential traffic volume delays and mitigation required. Load considerations and regularly scheduled maintenance checks.
Stormwater	Increased service demands & expansion of network. Increased storm runoff volumes from urbanization	Potential increase in capital budget due to increase in service network size and capacity.
Parks & Amenities	With forecasted population growth, increased demand for parks, playgrounds, and trails	More frequent inspections and maintenance of parks, playgrounds, and trails, potential for new parks and amenities
Facilities	Increased demand for programming may lead to capacity constraints and more competition for facility or room rentals	Greater usage of facilities will require increased frequency of maintenance activities
Rolling Stock	Higher population density will place more demand on Fire service vehicles. Potential for more demand on snowplows as new development results in additional roads	Increased frequency of maintenance activities for some vehicles, may require additional equipment and/or specialized fire vehicles

Equipment and other assets	Larger population will result in more demand for services	Increased maintenance for equipment will be required, potential for need to increase number of items available.

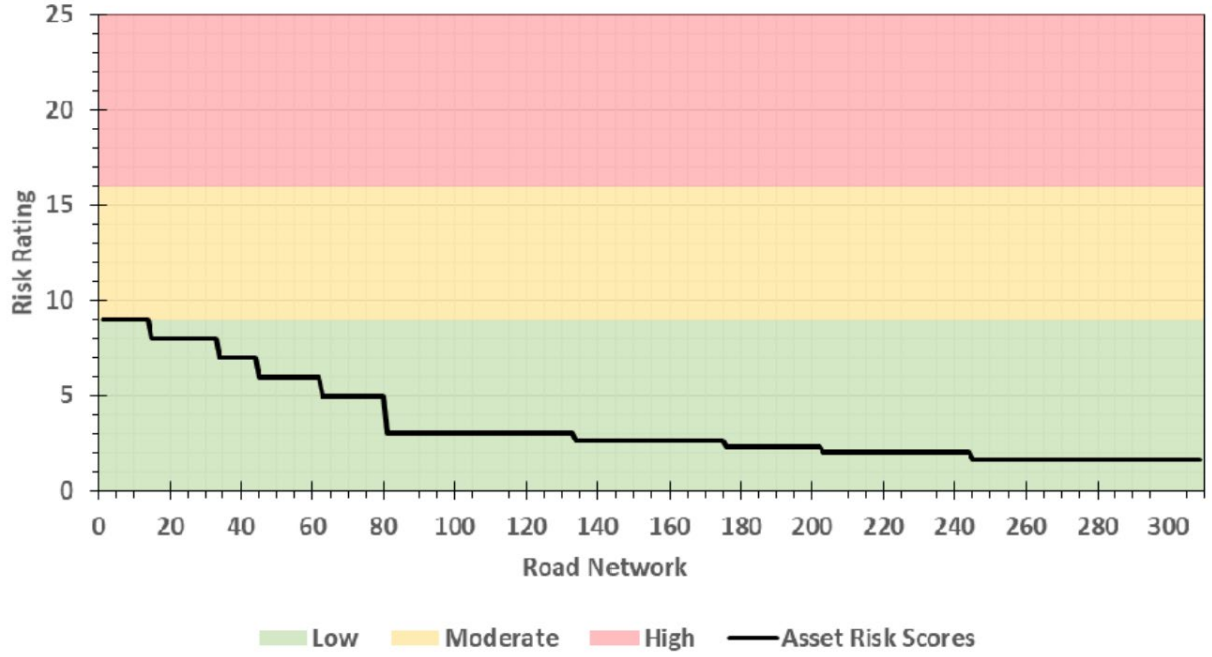
Growth related infrastructure and assets are reflected in the proposed level of services identified in Section 2. Typically, these assets are funded fully or partially through development charges. However, as they can impact level of service, the costs are included within the 10-year expenditures and the related financial strategy in Section 4.

3.2 Risk Assessment

In analyzing the different road segments based on age and the performance condition index, it was shown that there are no road segments with the moderate risk score (9-16) or the highest risk rating (above 16). All 309 road segments currently are in the lowest risk score (0-9).

It is important to highlight that the risk rating is used to inform the capital plan and the development of the capital plan considers other factors in addition to risk rating, such as scheduling, accessibility during construction, and availability of funding. The road Risk Profile can be seen below in Figure 53.

Figure 53 - Road Risk Profile



The road performance rating for individual asset were assumed to be “Always Reliable” as there were no roads indicated otherwise. Road segment importance was determined based on the street type. Moderate (2) importance roads are collector roads, and low (1) importance roads are local roads.

The condition and usage of the road assets is a key driver in the determination of lifecycle activities to use. The condition was determined in 2022 as part of this State of the Infrastructure Study for North Dumfries’ Road network and should continue to be updated by the Township. Condition of the roads can be completed on scheduled basis wherein the entirety of the network is reviewed in annual portions over a defined duration (example five years). A variety of methods can be implemented for undertaking condition assessment of roads, including visual inspection and street scan technology. A condition rating program can also be implemented that considers the importance or risk of a road segment and prioritizes frequency and timing of condition assessments to higher usage or higher importance roads. A condition assessment program is recommended for the Township.

Maintenance works should be undertaken throughout the lifecycle of an asset. Selection of the appropriate maintenance activity will depend on the type of deterioration being

experienced on the asset, and the condition of the asset. Some activities, such as crack sealing, are best utilized on a road segment that is generally in “Good” condition. As the road segment continues to deteriorate, maintenance activities may become a less preferred option.

Rehabilitation activities should be undertaken on an asset when it has deteriorated past the point where maintenance activities would be adequate to address condition issues. Selection of the appropriate rehabilitation activity will depend on the road surface material, stage in lifecycle, and severity and type of deterioration.

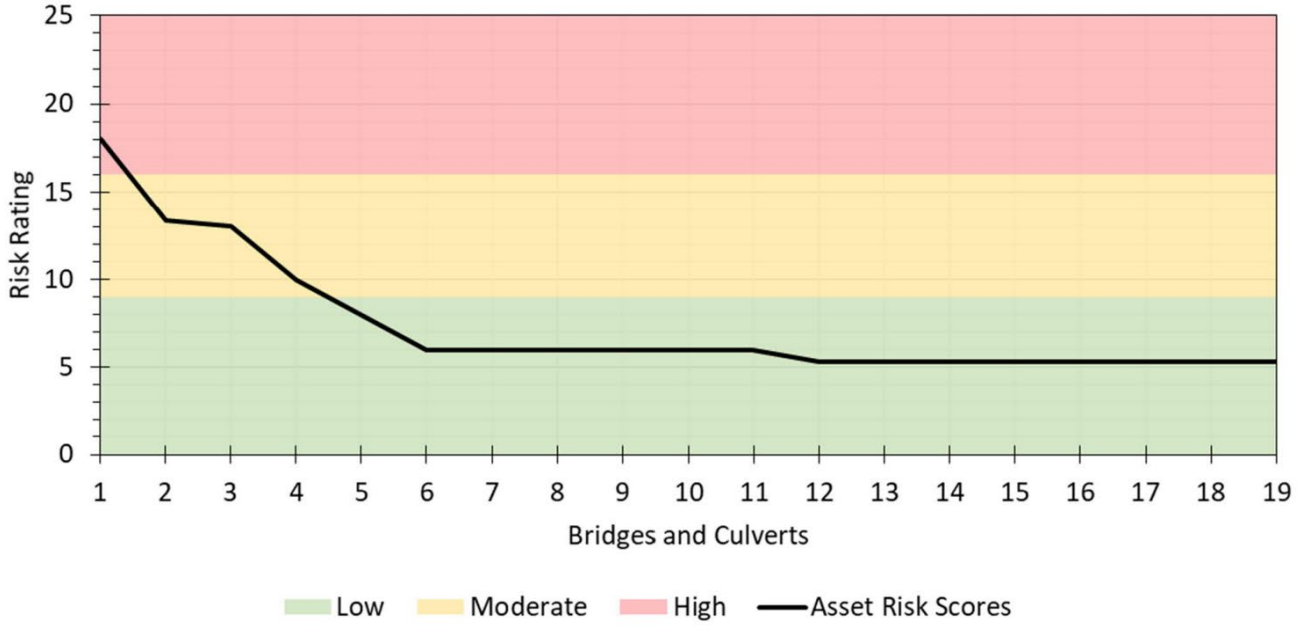
In general, the current strategy for the road assets at the Township is to allow the road surface asset to degrade near to the end of its expected lifecycle and reconstruct the road surface when required. The road base has a much longer expected useful life than the road surface and is dealt with as required during road works. The requirement for reconstruction of the road base is determined through a combination of staff knowledge of the road condition and conducting boreholes to assess the viability of the road base. The Township does not currently undertake boreholes for every road segment to be reconstructed.

As for gravel roads, it is recommended that the gravel roads be graded regularly, and gravel applied annually. Localized repairs and maintenance should also be completed where required. Reconstruction of these roads may be required if condition is found to have deteriorated, however the expected lifespan is long.

The risk profile for bridges and culverts are shown in **Figure 54.**

The bridges have a range of risk scores and fit into all of the risk ratings. The Footbridge Road Bridge is classified as High Risk, the Piper Steet Road and Nithvale Bridge are classified as Moderate Risk, and the Jedburgh Dam Bridge and the Shellard Road Bridge are classified as Low Risk.

Figure 54 – Bridge and Culvert Risk Profile



Performance rating for individual assets were assumed to be “Always Reliable” for all bridges other than those with load restrictions. As there were no road restrictions, the bridges were deemed always reliable.

Bridge and culvert importance was based on their proximity to densely populated areas and traffic levels as shown in **Figure 55.** Piper Street Bridge is rated of high importance as it is the main route from Ayr to a Regional Road, and Footbridge Road Bridge is the only bridge across the Grand River within the Township and leads to a Provincial Highway. The Jedburgh Dam Bridge is rated of moderate importance as there are alternative routes located conveniently within Ayr. Although the Shellard Road Bridge has higher traffic volumes, it is located within a rural portion of the Township and is also rated of moderate importance. All culverts were deemed to be of low importance due to their mostly rural locations and the Nithvale Bridge is currently closed to vehicular and pedestrian traffic.

Figure 55 - Importance Ratings Bridges and Culverts

Importance Rating	Bridges and Culverts
High (3)	Footbridge Road Bridge Piper Street Bridge
Moderate (2)	Shellard Road Bridge Jedburgh Dam Bridge
Low (1)	Nithvale Bridge All Culverts

A summary of recommended storm sewer pipe condition and associated lifecycle activity is provided in **Figure 56.** Note that condition assessment should be undertaken on a routine basis throughout the lifecycle of the asset, and other factors should be considered when selecting a lifecycle activity.

Figure 56 - Storm Sewer Lifecycle Activities and Condition Ranges

Condition Range	Condition Description	Lifecycle Activity Category	Lifecycle Activity
1.0 to 0.60	Very Good to Good	Maintenance	Maintenance Works (cleaning, flushing) Manhole repairs Small pipe section repairs
0.60 to 0.35	Good to Fair	Rehabilitation	Localized repairs Structural relining
0.35 to 0.0	Poor to Very Poor	Reconstruction	Pipe replacement or abandonment

Current best practices suggest that reconstruction and new construction works on the assets will be done using PVC material pipes that are 400 mm in diameter or less, and concrete material for sizes larger than 400 mm diameter.

The Township's facilities were assessed by Cion Corporation in 2023. The forecast provided 10-year maintenance, repair and rehabilitation list for the major facilities within the Township. The Township was also a partner with its insurance company in 2024 to

review facilities from a risk based perspective. No major issues were raised in the inspection program. Over the past decade, the Township has fallen behind in routine maintenance and rehabilitation at some of its facilities. This posses an increase risk to the reliability and availability of the Township's facilities. In addition, as Ontario continues to experience extreme weather event, our facilities may be more vulnerable.

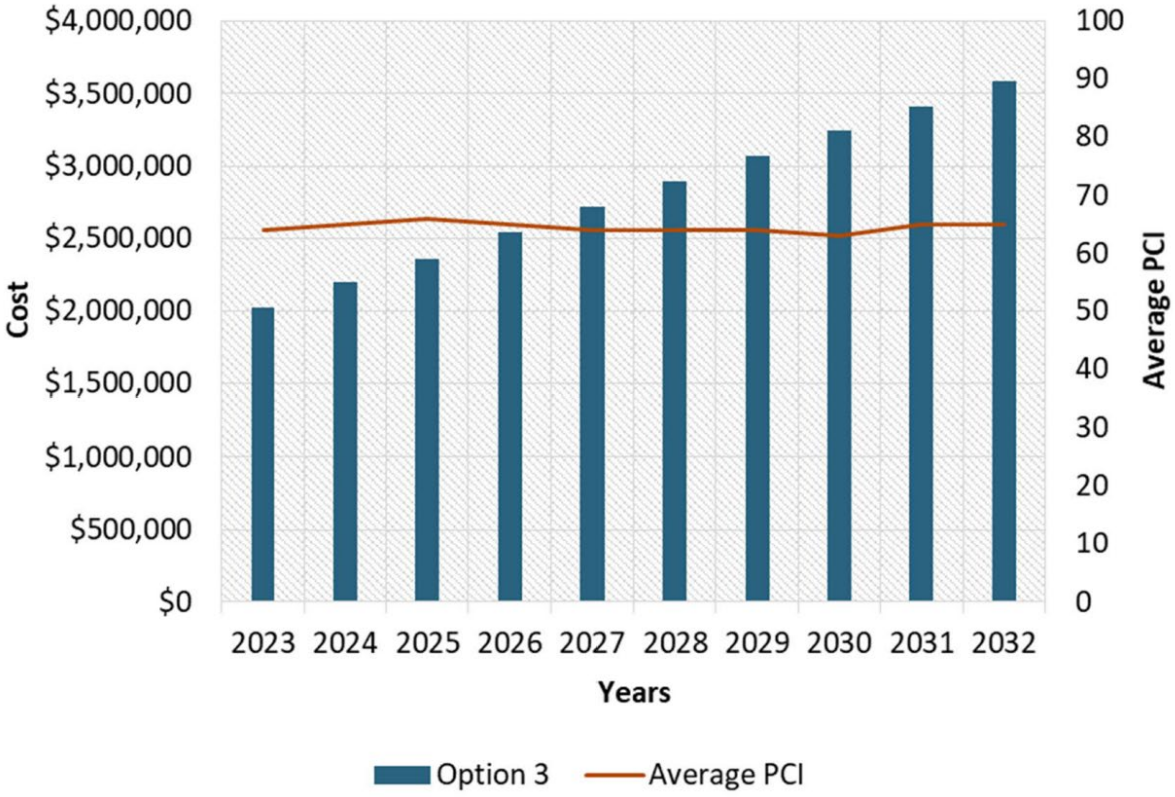
The Township's parks and amenities are routinely inspected. No issues has been raised as to general maintenance and repair of the assets. The Township has successfully implemented staggered replacement of playground equipment which has helped to mitigate the risk of reliability and provides for a more even cost-effective rehabilitation program.

The Township's rolling stock is subject to two main risks, Climate Change/Extreme Weather events and the adoption of new technology in terms of electric or hybrid alternatives. The Township's current maintenance program has been successful in maintaining the rolling stock in a reliable condition. No concerns have been raised over the need to change the maintenance program.

3.3 Cost Analysis

As part of the previous version of the AMP, analysis was undertaken on the core assets. Out of that analysis, it was determined that to achieve the average PCI of 65 for the road network within 10 years, annual average costs should be increased to $2.8 million dollars. This would allow for $28 million to be spent on the network over the next 10 years.

Figure 57- Average PCI of 65



The 2024 draft OSIM and peer review require $4.5 million to be spent on bridge rehabilitation in the next 5 years and $1.6 million on Culvert repair and maintenance. There is no over work required within the 10-year period. This results in an annual cost of $616,328. The Nithvale Bridge was not included in the 2024 OSIM report as it is closed. The Township still needs to determine the next steps in dealing with an asset that has exceeded its useful life. As there is not defined project or timeline, no costs have been included as part of this section of analysis.

Regarding Stormwater assets, best practice recommends maintaining an average condition index of 0.6 across the system. Note that the overall condition of the assets is such that if no budget is spent on the system, after the 20- year timeframe the average condition would be within the acceptable range, with the average condition still in a 'Very Good' range.

The storm sewer assets were assessed to be in Very Good condition, with no immediate needs for the system. In the 20-year timeframe, there were no identified investments with the network maintaining an average condition index of 0.9 across the network. An analysis was also undertaken to understand impacts of relining activities on the overall condition of the network, and associated costs.

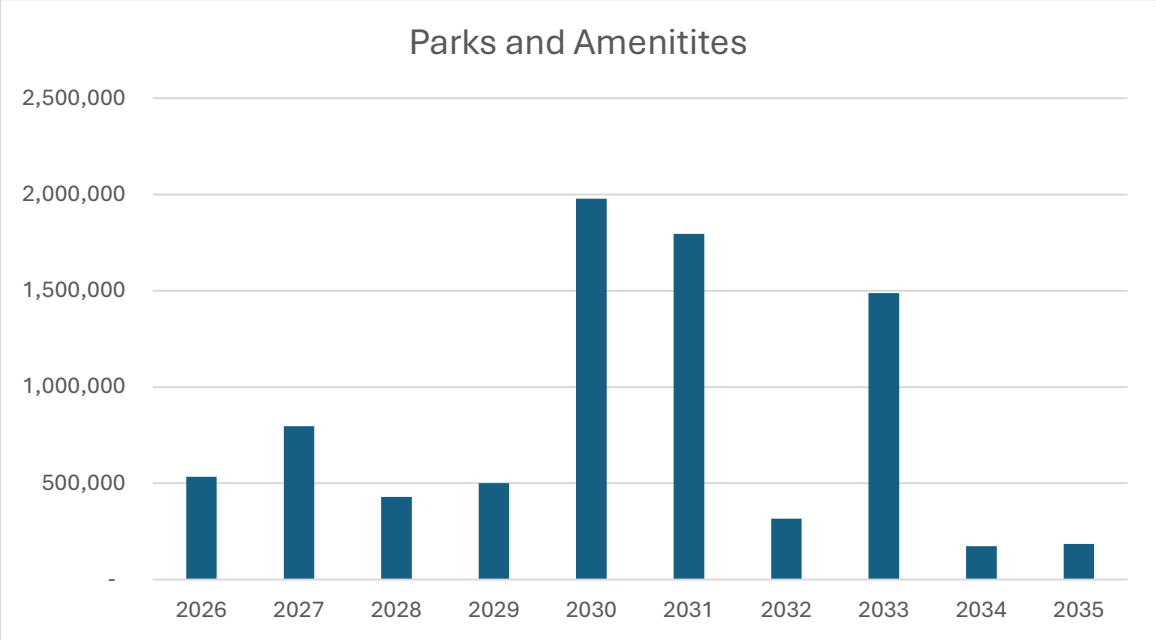
The Township is in the process of building a new twin pad arena attached to the current North Dumfries Community Complex. In addition, the Ayr Community Center needs significant repairs to maintain the functionality of the building. Total estimated costs for facilities over the next 10-years are $42,131,706 or $4.2 million a year. The figure below shows the uneven expenditures required over the next 10-years due to the timing of these projects.

Figure 58 – Facilities Costs

The Township parks and amenities require $8.19 million over the next 10 years, or $819,455 annually. The large increases in costs in 2030 and 2031 relate to growth

related projects to build new amenities and parks within new subdivisions. These costs are fully funded by development charges.

Figure 59 – Parks and Amenities



The Township's rolling stock requires annual contributions of $1,113,933 for a total of $11.1 million over the next 10-years. The Township has experienced increased costs in specialized vehicles, such as fire apparatus. The Township has also experienced longer than normal lead times to acquire new vehicles which has resulted in early planning and procurement procedures than has traditionally been necessary.

Finally, the Township's equipment and other assets require minimal annual contributions of $79,468.

The total cost associated with achieving the PLOS as per the AMP is as follows:

Figure 60 – Total cost associated with achieving PLOS

	10-Year Needs	Annual Contribution
Road network	87,995,260.00	8,799,526
Bridges and Culverts	6,163,285.00	616,328
Stormwater	-	-
Facilities	42,131,706.00	4,213,171
Park and Amenitiies	8,194,555.00	819,456
Rolling Stock	11,139,326.00	1,113,933
Equipment and Other	794,678.00	79,468

4. Financial Strategy

Asset management plans will only be successful if attention is paid to the full cost of the asset lifecycle. It is critical that the Township develop a clear financial strategy to fund the asset management plan. This strategy needs to be monitored annually to ensure that the Township is staying within the strategy as it develops the annual budget.

O. Reg 588/17 requires, at a minimum, a 10-year capital plan that forecasts the cost of implementing the lifecycle management strategy and the lifecycle activities required. The Township has traditionally completed a 10-year forecast as it relates to its capital plan. This AMP continues that process by updating the 10-year forecast to include all lifecycle management costs.

Various options have been consider, including the potential for future government grants, utilization of reserves and reserve funds, and the issuance of debt.

4.1 Annual Contribution and Lifecycle Funding Target

An annual lifecycle funding target represents the amount of funding that would be required annually to fully finance the full lifecycle management strategy. This target would theoretically allow the Township to fund costs as they arise. In fact, capital costs may fluctuate significantly from year to year. If the annual limit was maintained, it allows for reserves to be built up in a year with limited capital costs and reserves to be utilized in years where costs exceed the target. The Township already applies a version of this long-term strategy as the Township prefers to set-aside funds in reserves to fund future capital. However, there are costs identified in Section 3 that are not in the current 10-year forecast. This results in a different target than previously utilized.

The annual lifecycle funding target is $7.3 million. In contrast, the Township budget contributes approximately $2.8 million from the tax levy, and other external revenue sources towards capital reserves. The difference between this benched marked target and the actual funding is defined as the funding gap. Based on the analysis, the Township is currently facing an annual lifecycle funding gap of approximately $4.5 million.

A contributing factor the funding gap is the end of useful life of the Ayr Community Center. Significant components require upgrading to maintain functionality of the building. In addition, within the next ten-year forecast is plans to convert the ice arena into another purpose. The Township did not previously set aside enough funds to cover the cost of the major rehabilitation. This contributes to a larger funding gap.

Another contributing factor to the funding gap, is the lack of funds set aside for bridge and culvert repairs. The cost of these maintenance projects and major rehabilitation

projects has significantly increased in the 2024 OSIM report. Finally, the 2022 version of the AMP recommended increasing annual spending on road projects in order to obtain the proposed service level. For the past three years, the Township has spent less than the target amount. This has also contributed to the funding gap.

4.2 Funding

Over the next 10-years to meet PLOS and growth-related projects, the Township requires $73.4 million in funding. At the same time, there is only $43.1 million available. Leaving a funding gap of $30.3 million.

It is unrealistic to be able to close the funding gap through tax levy increases alone in the short-term. The required capital contribution needed to eliminate the funding gap will necessitate an increase in property taxes beyond a reasonable amount. Given the large costs expected to be incurred in the next two years, raising the capital contribution level to completely close the funding gap will result in excess funding than is required to maintain the proposed level of service.

The Township needs to implement more robust maintenance programs to extend the life of its assets. For instance, the Township does not currently have a program to patch cracks and perform sealing. Implementing a more comprehensive maintenance program would be a cost-effective way to extend the life of the road network and which should result in the reduction in the amount of funding required within the 10-year period.

Staff continuously monitor other grant opportunities and other funding opportunities. Growth-related projects which are not fully funded by development charges may be delayed in order to maintain existing assets.

The Township is currently undertaking a State of the Infrastructure Study for the road network in 2025, and is in the process of finalizing the 2024 OSIM report. It is recommended that this AMP plan be reviewed in the Winter of 2026 once more accurate and up to date information is available.

5. Monitoring and Improvement Plan

The AMP is a living document that requires regular review and updating. Available information is seldom complete across all classifications at the same time. For instance, State of Infrastructure – Roads Needs Studies and Facility Condition Reviews are seldom undertaken in the same year. O. Reg 588/17 requires the AMP to be updated once every five years. In addition, the plan should be reviewed annually as part of budget process. A culture of continuous improvement will assist the Township in managing its assets efficiently.

As new information becomes available staff will review the plan to ensure it remains accurate. The Township will continue to review the 10-year capital forecast at budget time and as part of a mid-year review. Steps will be taken to ensure that it reflects the lifecycle management strategies that formed part of the AMP.