

# Municipality of Dufferin

October 2022

## Asset Management Plan

Version 1.0

Edited on Sept 18, 2022

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## Introduction

In 2021, the Municipality of Dufferin started working toward a new way to guide their decision-making process for the sustainability of its owned assets. In 2022, the Municipality supported an Asset Management Policy by resolution. The Municipalities Policy defines 3 major objectives:

1. Consistent standards and guidelines for management of the Municipalities assets
2. Apply sound technical, social, and economic principals that consider present and future needs of users
3. Provide the services expected from the assets.

In October 2021, after the approval of an Asset Management Development Grant from The Federation of Canadian Municipalities the municipality of Dufferin started working with Way To Go Consulting Inc to develop its maturity in Asset Management and to develop a comprehensive Asset Management Plan focussing on its water distribution, transportation, and fleet and equipment infrastructure. In February of 2022 Way To GO Consulting Inc. brought on Buhlin Asset Management to start working with the municipality and develop this maturity and Plan.

This plan contains the following standard sections: Introduction, State of Local Infrastructure, Expected Levels of Service, Asset Management Strategy and Financial Strategy. The Asset Management Plan will outline the services provided by the municipality and the assets that provide, maintain, replace, and dispose of these assets. Plans are set out to ensure these assets are providing the expected level of service, and financial strategies are provided to allow the planned actions to be implemented. It is expected that this Asset Management Plan will be used to help determine when specific individual assets need to be replaced and when to allocate funds within the overall capital budget.

This Asset Management Plan was developed by Buhlin Asset Management, who worked closely with the municipality of Dufferin. This Asset Management Plan sets out a plan for the next ten years; however, it is recommended that the plan be updated on a regular basis and expanded to include all the municipalities owned assets.

The creation of this Asset Management Plan will further refine the municipalities long term capital planning and funding and bring a focus to maintaining a consistent level of service for the community that is user defined and sustainable.

# State of Local Infrastructure

## Asset Inventory

This section of the Asset Management Plan will cover water distribution, transportation, and fleet and equipment infrastructure assets owned by the municipality. Data was gathered by Public Works Staff and collated by administration. The asset inventory has been consolidated into a spreadsheet called the Asset Register.

## Transportation

The Transportation portion of the Asset Management Program includes assets related to the conveyance of both vehicular and pedestrian traffic and other related services throughout the municipality. This asset class includes road surface, road base and subbase, curb and gutter and sidewalk assets. This class does not include bridges, ford crossings or active transportation paths.

The Municipality of Dufferin owns approximately 1, 022, 400 meters of road surface infrastructure. The current material types found on the road surfaces are dirt, gravel, a shale/gravel combination, and undeveloped road rights-of-way. Figure 1 shows the distribution of road surface lengths by construction year and road surface material.

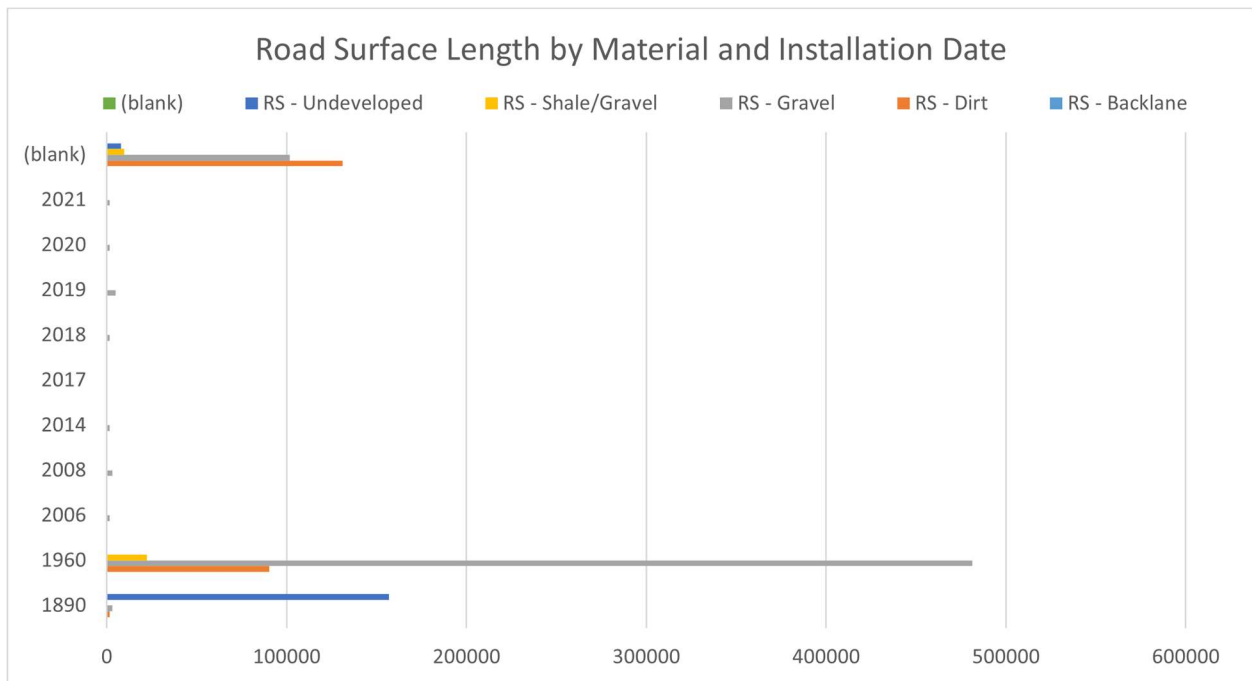


Figure 1 - Road Surface Length by Material and Installation Date

A large portion of the gravel road network was constructed in 1960 or earlier. Some roads have been rebuilt since they were first constructed to upgrade the level of service being provided. With rural roads we need to put less stock on the year of construction and concentrate more on the maintenance management of the asset to ensure sustainable service delivery. There is also a large portion of road surfaces that did not have all the required information to fill the Asset Register. This will be rectified as the Asset Management Program matures.

The Current Replacement Costs for all the of assets currently stored in the Transportation asset class is \$12,888,000. The replacement cost numbers were generated by the Municipality of Dufferin Public Works staff and will be updated on an annual basis and adapted into the Life Cycle Management portion of this Plan.

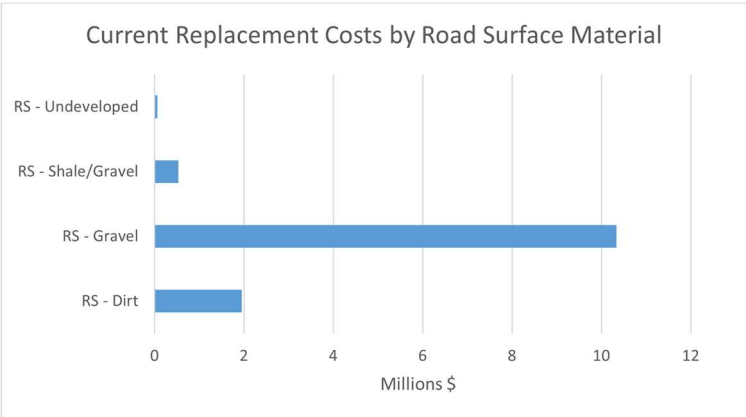


Figure 2 - Current Replacement Costs by Road Surface Material

### Water Distribution

The Water Distribution portion of the Asset Management System includes all the assets underground for the distribution of clean drinking water and related services. This asset class includes water mains, valves, flush-outs, curbstops, water meters, meter chambers and pressure reducing valves but not the above ground structures and buildings that house reservoirs or pump buildings.

The Municipality of Dufferin has approximately 388,700 meters of underground water main infrastructure. The current water main material types are PVC, HDPE, and LDPE with an average life expectancy of 160 years, 160 years and 150 years respectively. Currently the average water main pipe age is 22 years with the oldest pipe installed in 1996 and makes up 3.2% of the entire system in the municipality. A distribution of water main lengths by installation year and water main material is shown in Figure 3.

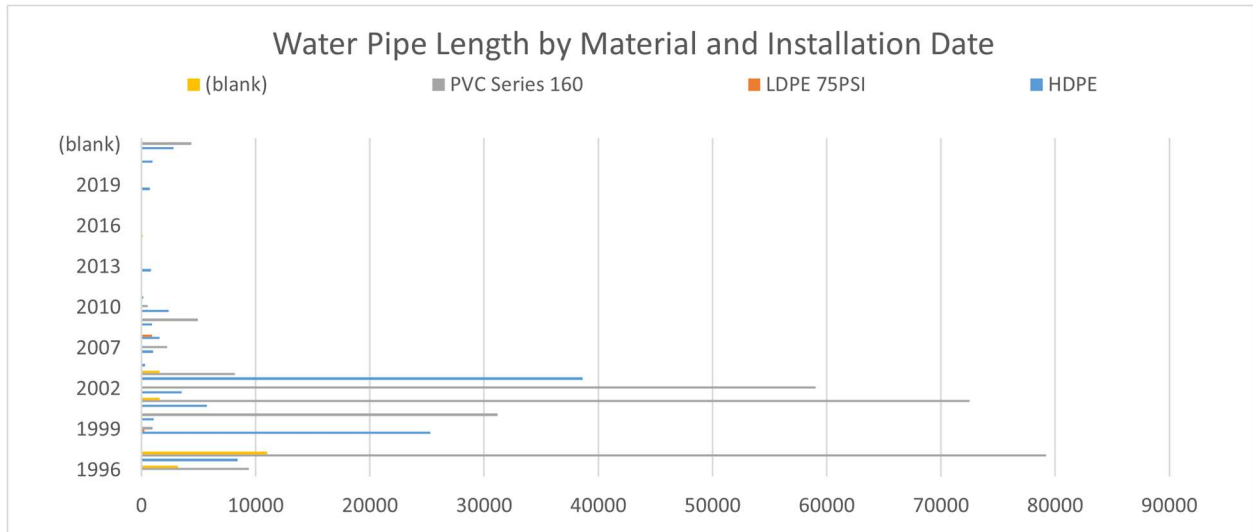


Figure 3 - Water Pipe Length by Material and Installation Date

A large portion of the system was installed between 1996 and 2003 with phased extensions to the system for the next 2 decades. A large portion of the system is PVC and in the 50mm and 75mm pipe sizes as we can see in Figure 4.

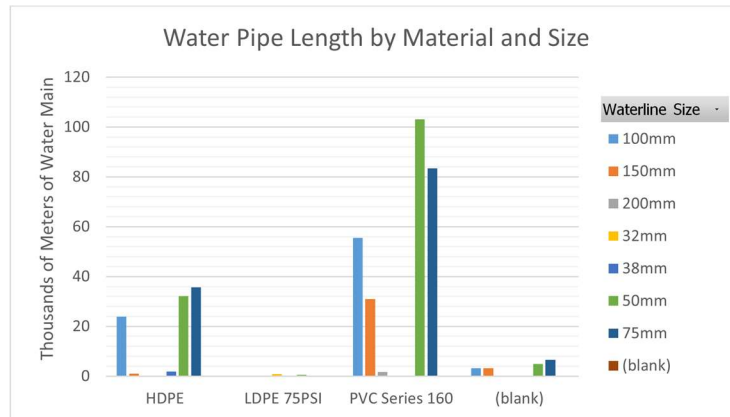


Figure 4 - Water Pipe Length by Material and Size

Some assets in the Asset Register did not have the correct information as seen at the end of the chart. Gaps like this will be rectified in future versions of this Asset Management Plan.

The Current Replacement Costs of all Water Distribution assets is \$15, 907, 141. A distribution of the replacement costs for each of the Water Distribution Sub Classes is shown below in Figure 5.

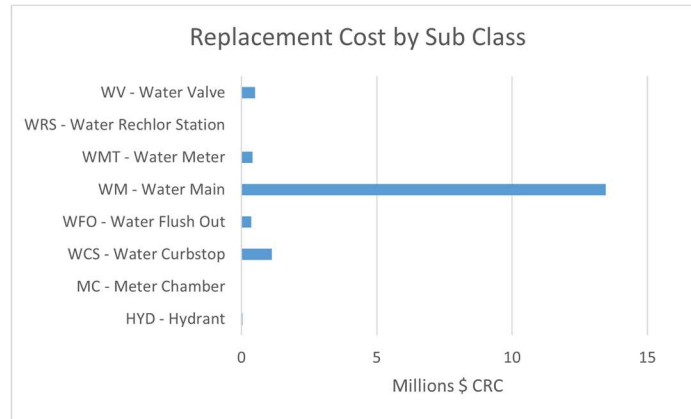


Figure 5 - Water Distribution Replacement Costs by Sub Class

### Fleet and Equipment

The Fleet and Equipment portion of the Asset Management System includes all assets used to ensure that assets are maintained and meet performance targets for all services provided by the Municipality of Dufferin. This includes light, medium, and heavy equipment and vehicles used by the public works department, utility department and recreation services. There are currently 76 assets in this class, which some include shared assets with the Town of Carmen. As the Asset Management Program develops in maturity more assets will be added to this class to ensure that all equipment required to sustain current service levels.

The average in service age for the assets listed in the Fleet and Equipment class is 14 years. With the oldest being in service since 1985 which is the Fire – Van-old Rescue Van, to the newest in-service asset being the MG - 2 Cat Motor Grader put into service in 2022. A distribution of asset in service dates by asset sub class is shown below in Figure 6.

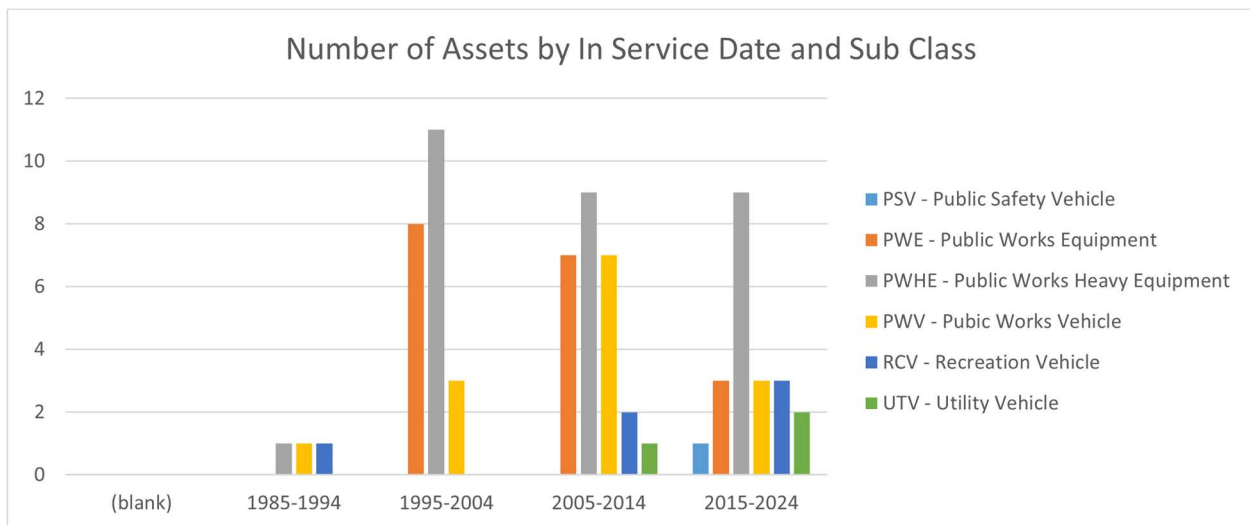


Figure 6 - Number of Assets by In Service Date and Sub Class

The assets currently stored in the Asset Register in the Fleet and Equipment asset class have a Current Replacement Cost of \$4,482,585. Some of this cost is through a shared ownership



agreement with the Town of Carmen. Below in Figure 7 is a distribution of replacement costs by the Fleet and Equipment Sub Classes.

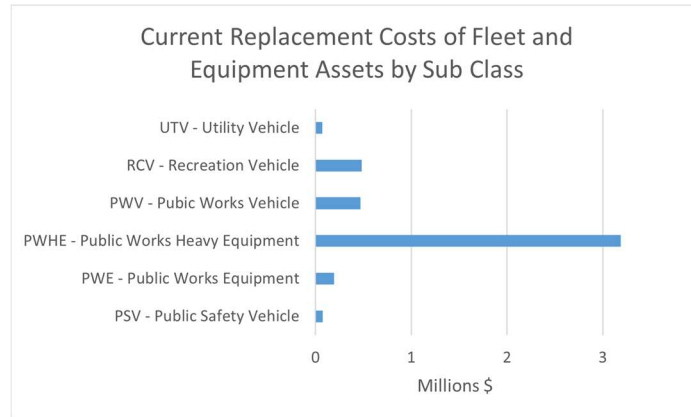


Figure 7 - Current Replacement Costs of Fleet and Equipment Assets by Sub Class

### Asset Valuation

This section outlines the value of the Municipality of Dufferin's current infrastructure and the costs to replace the infrastructure at the end of its life cycle. The following formula are used in these valuations.

Current Replacement Costs (CRC):

$$CRC = \text{cost per meter} * \text{length of pipe or road}$$

Future Replacement Costs (FRC):

$$FRC = CRC * (1 + i)^n$$

Where: *CRC* is the Current Replacement Cost  
*i* is the Current Inflation Rate per Year  
*n* is the Remaining Useful Life in Years

Depreciated Value (DV):

$$DV = CRC - ((\text{age}/i)^n) * CRC$$

Where: *CRC* is Current Replacement Cost  
*i* is Expected Life Cycle in Years  
*n* is 4 for above ground assets or  
*n* is 6 for below ground assets

Investment Required (IR)

$$IR = FRC / (1 + i)^n$$

Where: *FRC* is Future Replacement Cost  
*i* is the Current Rate of Return per Year  
*n* is the Remaining Useful Life in Years

## Transportation

The following information describes the methodology to determine the costing for transportation infrastructure. Some assumptions were made and are:

- Based on information from the PSAB reporting system
- Price does not include engineering fees
- Prices based on current practices, technologies, and materials for similar replacement.

The following tables show the assumed cost to replacement based on historical projects and consultation with local contractors.

*Table 1 - Transportation Road Surface Replacement Costs*

Road Surface Material	Cost per Mile
Dirt	\$8,000
Gravel	\$29,000
Shale/Gravel	\$29,000
Undeveloped	\$8,000

Table 1 shows the Current and Future Replacement Cost, Depreciated Value and the Investment required for the Transportation Asset Class. This table is based on five-year increments relating to the year each asset reaches the end of its useful life cycle. Based on the table, the Municipality of Dufferin's Transportation Asset Class has a current Depreciated Value of approximately \$12,412,190. The assets useful life based on condition of the asset are used to calculate Depreciated Value for Transportation assets.

The following Table 2 also displays the projected cost for the future replacement of assets based on their end-of-life dates. The future replacement costs are built with a constant inflation of 2%. The investment needed today would be the required amount to have in a reserve fund today gaining 1.5% interest. As there is a total of \$13,938,247, this would be the amount needed in the reserve fund as of today to ensure there is enough money to afford the project with no other need of investment.

*Table 2 – Transportation Valuations by Replacement Year*

Year	Current Replacement Cost	Depreciated Value	Future Replacement Cost	Investment Needed Today
2025-2030	\$176,000	\$124,245	\$189,417	\$179,238
2030-2035	\$1,557,000	\$1,445,011	\$1,881,504	\$1,631,889
2035-2040	\$8,117,087	\$7,986,020	\$10,960,440	\$8,745,111
2040-2045	\$692,029	\$692,029	\$1,028,316	\$763,496
2045-2050	\$568,000	\$527,146	\$933,830	\$642,582
2055-2060	\$1,620,000	\$1,608,740	\$3,341,671	\$1,938,855
2070-2075	\$29,000	\$29,000	\$78,056	\$37,077
Totals	\$12,591,116	\$12,412,190	\$184,132,234	\$13,938,247

## Water Distribution

The following information describes the methodology to determine the costing for water distribution infrastructure. Some assumptions were made and are:

- Price includes excavation, supply, and installation of pipe and or manhole structures.
- Price does not include engineering fees
- Assumed water pipe depth based on previous projects; prices could fluctuate depending on actual depth of cut
- Prices based on current practices, technologies, and materials for similar replacement.

The tables below show the cost to replace assets in the Municipality of Dufferin. These costs are estimated on historical project and with consultation with local contractors.

*Table 3 - Water Distribution Main Line Replacement Costs*

Water Main Pipe Size	Cost per Linear Meter
32mm	\$22
38mm	\$26
50mm	\$30
75mm	\$34
100mm	\$38
150mm	\$47
200mm	\$63

*Table 4 - Water Distribution Valve Replacement Costs*

Water Main Valve Size	Cost per Unit
50mm	\$1780
75mm	\$1900
100mm	\$3850
150mm	\$4825
200mm	\$6250

*Table 5 - Water Distribution Flush Out Replacement Costs*

Water Main Flush Out Size	Cost per Unit
50mm	\$2350
75mm	\$2900
100mm	\$4575
150mm	\$5750
200mm	\$8250

*Table 6 - Water Distribution Curbstop Replacement Costs*

Service Line Curbstop Size	Cost per Unit
32mm	\$1600
38mm	\$1600
50mm	\$1725

*Table 7 - Water Distribution Water Meter Replacement Costs*

Water Meter Size	Cost per Unit
16mm	\$595
19mm	\$647
25mm	\$742
38mm	\$1046
50mm	\$1221

*Table 8 - Water Distribution Hydrant Replacement Costs*

Fire Hydrant Type	Cost per Unit
Self Draining	\$8000
Pump Out	\$7000
Dry Hydrant	\$6000

*Table 9 - Water Distribution Meter Chamber Replacement Costs*

Meter Chamber Size	Cost per Unit	Meter Chamber with PRV
Size 3	\$23,650	\$28,900
Size 4	\$42,895	\$48,145

Table 10 shows the Current and Future Replacement Cost, Depreciated Value and the Investment required in the Water Distribution Asset Class. This table is based on five-year increments relating to the year each asset reaches the end of its useful life cycle. Based on the table, the Municipality of Dufferin's Water Distribution Asset Class has a current Depreciated Value of approximately \$15,271,582. These numbers are also taking in only the assets age into account and not the condition of the asset. With proper maintenance this is where we can gain value from the assets. Once full condition assessments of all the assets are completed a more realistic useful life can be calculated considering condition as well as age.

Table 10 - Water Distribution Valuations by Replacement Year

Year	Current Replacement Cost	Depreciated Value	Future Replacement Cost	Investment Needed Today
<2025	\$586,213	\$0	\$0	\$46
2035-2039	\$594,385	\$562,287	\$808,654	\$641,540
2040-2044	\$671,495	\$658,748	\$987,051	\$738,828
2045-2049	\$214,955	\$212,274	\$356,380	\$243,675
2050-2054	\$174,565	\$173,867	\$313,842	\$201,908
2055-2059	\$62,220	\$62,187	\$126,207	\$74,151
2060-2064	\$19,376	\$19,375	\$41,884	\$23,459
2065-2069	\$3,570	\$3,570	\$8,365	\$4,410
2070-2074	\$595	\$595	\$1,570	\$757
2075-2079	\$146,775	\$146,641	\$437,550	\$192,466
2080-2084	\$165,425	\$165,375	\$537,045	\$221,558
2085-2089	\$9,950	\$9,950	\$36,182	\$13,707
2090-2094	\$4,700	\$4,700	\$18,068	\$6,565
2095-2099	\$9,825	\$9,825	\$43,712	\$14,229
2100-2104	\$6,925	\$6,925	\$33,100	\$10,210
2155-2159	\$4,890,202	\$4,890,134	\$71,230,596	\$9,505,973
2160-2164	\$7,818,624	\$7,818,589	\$123,959,325	\$15,521,423
2165-2169	\$348,840	\$348,840	\$6,305,538	\$715,419
2170-2174	\$121,965	\$121,965	\$2,317,612	\$253,249
2175-2179	\$26,036	\$26,036	\$577,146	\$56,167
2180-2185	\$29,700	\$29,700	\$692,124	\$64,876
Totals	\$15,906,341	\$15,271,582	\$208,831,950	\$28,504,617

### Fleet and Equipment

The following information describes the methodology to determine the costing for fleet and equipment infrastructure. Some assumptions were made and are:

- Each vehicle or equipment sub class will have its own methods for determining replacement costs.
- Costs may be above or below expected levels depending on market fluctuations.
- Trade In Value may differ from year to year depending on market fluctuations.

To get a proper valuation of the Fleet and Equipment Asset Class a more in depth look at the individual asset that are owned and classify them into groups that can have directly relevant life cycles, depreciation curves, and future projections. This section of the Asset Management Plan will be updated in more mature versions of this Plan.

## Asset Condition Report

This section outlines the condition of the Municipality of Dufferin's current infrastructure assets and the scale on which they are assessed. Table 8 below, defines the asset condition ratings that are assigned to the assets in the following subsections.

All assets, whether divided into a sub-class, will be assessed based on the following scale:

Table 11 - Condition Rating Scale

Number Value	Rating	Definition of Rating
1	Very Good	Asset is fit for the future. Only planned maintenance required.
2	Good	Minor maintenance required plus planned maintenance.
3	Fair	Significant maintenance required. Beginning to show signs of deterioration.
4	Poor	Significant renewal/rehabilitation required. Asset approaching end of life.
5	Very Poor	Physically unsound and/or beyond rehabilitation.

## Transportation

There is no current formal inspection program for the assets in the Transportation Asset Class. With the development of a formal program that can be made easily repeatable for all assets, the Asset Register can be populated with the currently missing data. This will allow for a clearer picture of all the assets and their current ability to meet service level targets.

Figure 8 shows the current distribution of condition across the assets in the Transportation Asset Class. As more assets are added to the Asset Register and the development of a maintenance management system come into maturity this portion of the asset management plan will be updated and reflect those changes.

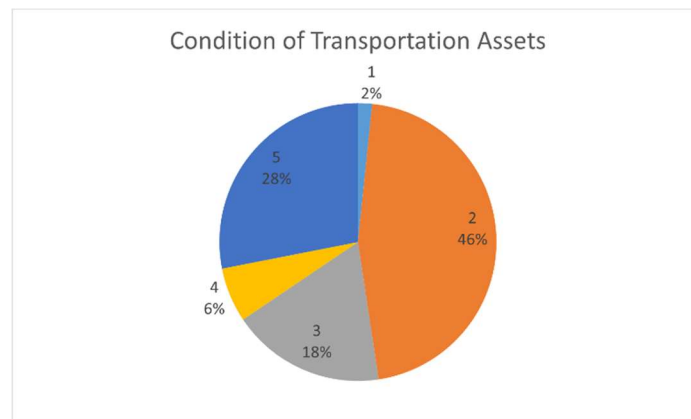


Figure 8 - Condition of Transportation Assets

More information on the assets and their current maintenance schedule is needed before a more inclusive risk analysis can be completed on the Transportation Asset Class. This will be updated in future iterations of this Asset Management Plan.

### Water Distribution

As underground infrastructure is usually not inspected like other above ground assets, we assume condition and will begin to rate condition based on the assets performance. A series of Levels of Service should be developed to begin tracking performance related Key Performance Indicators.

Below in Figure 9 we can see the distribution of condition ratings across the Water Distribution Asset Class. As more assets are added to the Asset Register under this class this portion of the Asset Management Plan will be updated to reflect those additions.

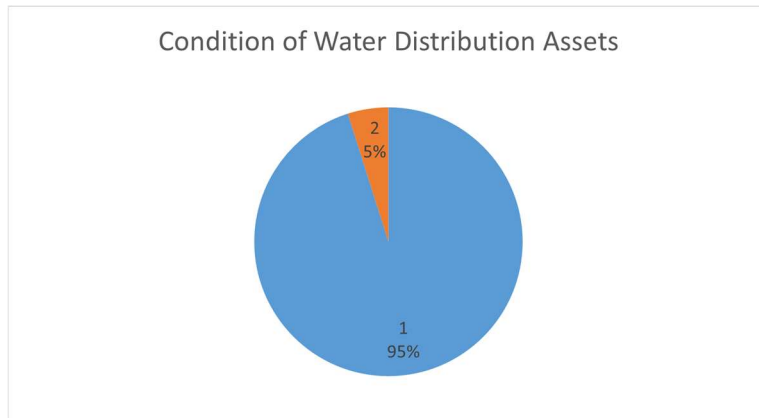


Figure 9 - Condition of Water Distribution Assets

When reviewing the condition of an asset we must also look at its likelihood of failure based on the age and expected life. Figure 5 below shows the likelihood of failure of a water pipe based on its diameter. Figure 10 shows that the older a pipe is and the greater the size of a wastewater pipe the greater the impact to service should the pipe fail. This means that the assets in the “Moderate” risk section should be monitored for signs of failure more frequently to ensure the sustainability of the services being provided.

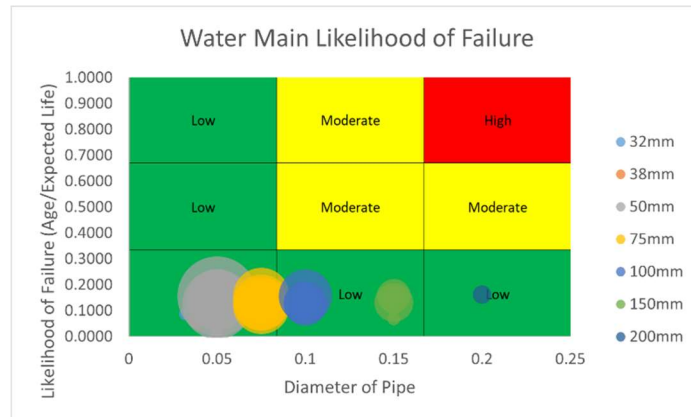


Figure 10 - Water Main Likelihood of Failure

## Fleet and Equipment

Condition ratings for the Fleet and Equipment Asset Class are dependant on the asset. Each Asset Subclass and even assets under certain Asset Descriptions may have different rating systems depending on the asset. Below, Figure 11 shows the distribution of condition rating across all the assets in the Fleet and Equipment Asset Class.

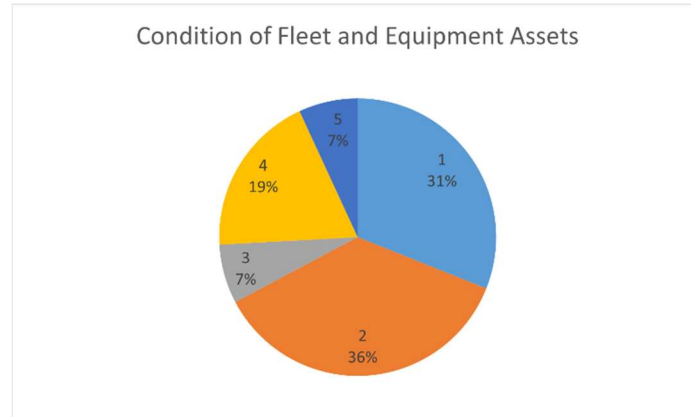


Figure 11 - Condition of Fleet and Equipment Assets

Once a maintenance management program has been developed for these assets a more in depth look at the likelihood of failure and risks of these assets can be assessed and added to this Asset Management Plan.

## Overall Infrastructure Report

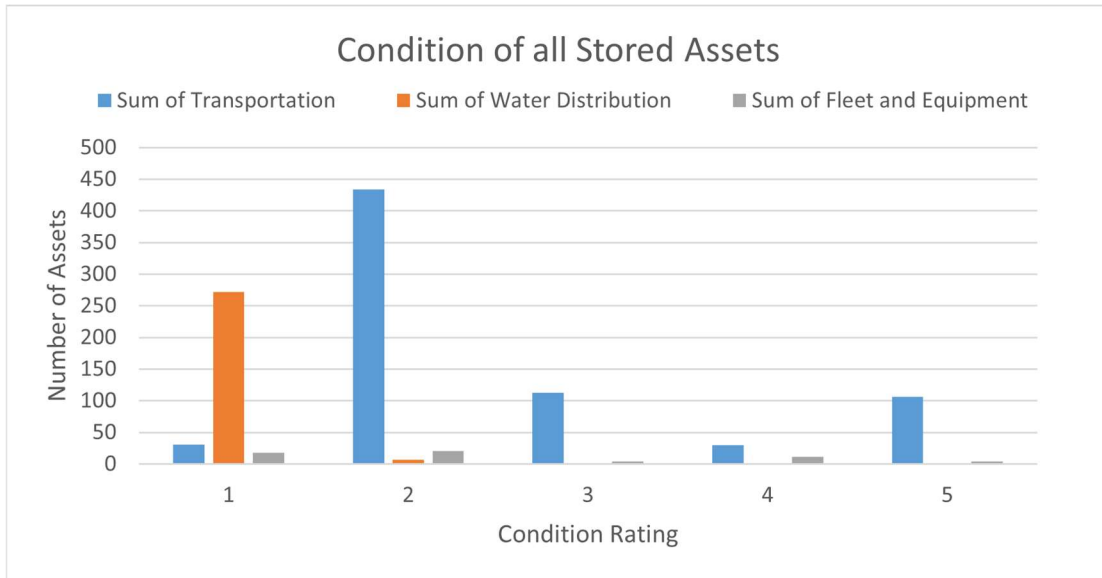
In summary, the infrastructure report for the Municipality of Dufferin is as follows:

Table 12 - Overall Condition Rating

Asset Class or Sub Class	Rating	Grade
Transportation	2.64	Fair
Water Distribution	1.03	Very Good
Fleet and Equipment	2.34	Good

The condition ratings for the assets currently in the Asset Register in a Good Rating overall. Although the rating averages are pretty good there is still a need to ensure we have maintenance plans in place to gain the most value out of the owned assets. With the installation of a maintenance management plan the Municipality of Dufferin can see a high level of condition which leads to good asset performance which leads to sustainable service delivery.





*Figure 12 - Condition Rating of All Asset Classes*

There are very few assets with poor or very poor condition rating, and these have been placed onto a repair or renewal schedule. All other assets are in a fair, good, or very good condition and the Municipality of Dufferin should continue to complete routine maintenance to these assets to maintain service levels and receive the most amount of value out of its owned infrastructure.

## Levels of Service

Buhlin Asset Management performed a presentation for key Municipal staff on April 28<sup>th</sup>, 2022, on Levels of Service. The presentation focused on the need, purpose, and responsibilities of Levels of Service and the role of elected officials in gathering the correct information to ensure that the services that the municipality currently delivers can be managed in a sustainable and efficient fashion that is easy to monitor and maintain.

The following table represents both Key Performance Indicators selected by the Municipality of Dufferin and ones suggested by Buhlin Asset Management based on best practices. Key Performance Indicators can differ depending on asset class as performance for each asset is based on separate metrics and factors—for example, BCI for bridges or CCTV grades for wastewater infrastructure.

*Table 13 - Key Performance Indicators*

Asset Class	KPI	Measured By	Comments
Transportation	Condition 1-3	Visual Inspection with Inspection Notes	Visual inspections are completed with inspection aids and common inspection forms
	Cost 3x Normal	Annual maintenance costs (scheduled and reactive)	No surface should incur more than 3 times its expected annual maintenance costs
	Performance <1	Number of service interruptions due to transportation asset failures	See record keeping for information required
Water Distribution	Performance <1	Number of breaks per year	See record keeping for information required
	Performance <1	Number of water quality incidents per year	See record keeping for information required
	Performance >30PSI	Fire flow / Available pressure	See record keeping for information required
	Condition 1-3	Age and Material	
Bridges	Condition 1-3	Bridge Condition Index (BCI) as provided by a registered bridge inspector	Inspection frequency based on a five-year rotation
	Collision <1	Number of Vehicle impacts per year	Any vehicle impact damage to structure
Fleet and Equipment	Performance <10%	Unscheduled Downtime	Unscheduled maintenance time vs scheduled maintenance time
	Condition 1-3	Each asset sub class will have a customized condition scale available	Each asset sub class will have a customized inspection schedule

## Data Collection

To record, track and monitor KPIs it is recommended that the Municipality of Dufferin collect the information listed below. As the information is collected it is important that the identifier for the affected asset or assets be collected as part of the new record on the appropriate inspection forms.

These forms can be found in the Asset Management central repository. A long-term recommendation would be to consolidate all asset and KPI information in a centralized Asset Registry database.

### Transportation

1. Road or sidewalk name inclusive of from/to
2. Physical road characteristics (material, last renewal date)
3. Road classification
4. Maintenance performed on road or sidewalk, inclusive of year and the year most recently resurfaced
5. Cause of service interruption (if applicable)
6. Time to respond to service interruption (if applicable)
7. Time taken to perform maintenance or bring asset back to service

### Water Distribution

1. Date of break or water quality incident
2. Location of break or water quality incident
3. Cause of break or water quality incident
4. Pipe characteristics (diameter, material, installation year)
5. Time taken to respond to incident
6. Time taken to return water main back to service

### Fleet and Equipment

1. Vehicle or equipment make serial number, hours or odometer reading
2. Physical asset characteristics (model, department, tonnage)
3. Vehicle or equipment classification
4. Maintenance performed on vehicle or equipment, inclusive of date
5. Scheduled or unscheduled maintenance
6. Time taken to return vehicle or equipment back to service

## Life Cycle Management

It is recommended that the Municipality of Dufferin adopt a Life Cycle Management Policy that outlines and provides guidance to Administration on the practices and standards the Municipality shall use to maintain, operate, renew, and decommission the Municipality's Capital Assets.

### Maintenance

The Municipality of Dufferin shall implement maintenance strategies for each asset class to ensure asset reliability while maximizing the life cycle of an asset. Each asset belonging to the Fleet & Equipment Asset Class shall have a customized maintenance program

Each asset in the Municipality of Dufferin Asset Register shall be inspected on a scheduled basis. Based on the results of the scheduled inspections, the appropriate maintenance activity will be considered subject to the availability of resources.

Each asset subclass in the Asset Register shall receive routine maintenance activities to maximize the service life of each asset. Maintenance activities for each asset subclass are listed below in Table 14.

*Table 14 - Maintenance Activities by Asset Class*

Asset Sub Class	Scheduled Maintenance Activities	Reactionary Maintenance Activities
<b>Facilities</b>	Each asset belonging to the Facilities Asset Class shall have a customized maintenance program	
<b>Fleet and Equipment</b>	Each asset belonging to the Fleet Asset Class shall have a customized maintenance program	
<b>Land &amp; Land Improvements:</b> Gravel Parking Lots	Add Gravel Reshape	Spot Repairs – Gravel Fill
<b>Transportation:</b> Gravel Road Surface	Add Gravel Reshape	Spot Repairs – Gravel Fill
<b>Transportation:</b> Road Base	Repack	
<b>Transportation:</b> Road Subbase	N/A	
<b>Water Distribution:</b> Water Main	Pipe Relining	Section Cut Out Replacement Saddle Clamp (small leak repair)

### Preferred Asset Characteristics

When acquiring a new asset, the Municipality shall give preference to these assets that have preferred characteristics. The table below outlines the preferred asset characteristics for each Asset Class in the Municipality of Dufferin Asset Register.

Table 15 - Preferred Asset Characteristics by Asset Class

Asset Class	Asset Subclass	Preferred Asset Characteristics
<b>Facilities</b>		
	<ul style="list-style-type: none"> <li>• Recreation and Culture Buildings</li> <li>• Water Distribution Buildings</li> <li>• Civic Buildings</li> <li>• Library</li> <li>• Heritage Buildings</li> <li>• Storage Buildings</li> <li>• Community Halls</li> </ul>	<ul style="list-style-type: none"> <li>• Renewable Energy Heat Source (Fossil Fuel Free)</li> </ul>
<b>Fleet and Equipment</b>		
	Fire Trucks	<ul style="list-style-type: none"> <li>• Manufacturing must be a current member of the Fire Apparatus Manufacturers Association (FAMA)</li> <li>• Manufacturer must be registered with Transport Canada to the National Safety Mark Standards</li> </ul>
	<ul style="list-style-type: none"> <li>• Truck (1 Ton)</li> <li>• Truck (Under 1 Ton)</li> </ul>	<ul style="list-style-type: none"> <li>• 2 Wheel Drive</li> <li>• 8 Foot Box</li> <li>• Electric/Hybrid/Low GHG</li> </ul>
	Road Equipment	<ul style="list-style-type: none"> <li>• Certified ROPS to meet requirements of SAE-J1040 and ISP 3471</li> <li>• Certified FOPS to meet requirements of SAE-J1043 and ISO 3449, Level II</li> <li>• Units shall be standard production models in the latest design current production</li> <li>• Diesel engine capable of developing no less than 60 SAE Horsepower</li> <li>• Block Heater</li> </ul>
	<ul style="list-style-type: none"> <li>• Cleaning Equipment</li> <li>• Fuel Tank</li> <li>• Grass Equipment</li> <li>• Ice Resurfacing</li> <li>• Pumps</li> </ul>	Unique to Each Equipment Type
<b>Land and Land Improvements</b>		
	Parking Lot Surface	<ul style="list-style-type: none"> <li>• Crushed Gravel (3/4" down)</li> </ul>
	Parking Lot Base	<ul style="list-style-type: none"> <li>• Crushed Gravel (3/4" down)</li> </ul>
	Parking Lot Subbase	<ul style="list-style-type: none"> <li>• Crushed Gravel (2" – 6" down)</li> </ul>
<b>Transportation</b>		
	Road Base	<ul style="list-style-type: none"> <li>• Crushed Gravel (3/4" down)</li> </ul>
	Road Subbase	<ul style="list-style-type: none"> <li>• Crushed Gravel (2" – 6" down)</li> </ul>
	Road Surface	<ul style="list-style-type: none"> <li>• Crushed Gravel (3/4" down)</li> </ul>
<b>Water Distribution</b>		
	Water Main	<ul style="list-style-type: none"> <li>• PVC (Polyvinyl Chloride)</li> <li>• HDPE (High Density Polyethylene)</li> </ul>

## Asset Operation

The Municipality of Dufferin shall maintain a yearly schedule, outlining the per unit cost of all operating activities.

## Facilities

Each asset belonging to the Facilities Asset Class shall have a customized schedule for routine operational activities.

## Fleet and Equipment

Each asset belonging to the Fleet and Equipment Asset Class shall have a customized schedule for routine operational activities.

## Land & Land Improvements

### *Parking Lots (Gravel)*

Each gravel parking lot will be subject to the following scheduled operational activities.

*Table 16 - Asset Operation - Parking Lots (Gravel)*

<b>Operational Activities</b>	<b>Schedule</b>	<b>Unit of Measurement</b>
Grading	Annually (1)	Linear Meter
Snow Clearing	As Required	Linear Meter

## Transportation

### *Gravel Road Surface*

*Table 17 - Asset Operation - Gravel Road Surface*

<b>Operational Activities</b>	<b>Schedule</b>	<b>Unit of Measurement</b>
Dust Control	As Required	Linear Meter
Snow Clearing	As Required	Linear Meter
Sanding	As Required	Linear Meter

## Water Distribution

### *Water Main*

*Table 18 - Asset Operation - Water Main*

<b>Operational Activities</b>	<b>Schedule</b>	<b>Unit of Measurement</b>
Flushing	Annually (Fall)	Linear Meter
Swabbing	As Required	Linear Meter

### *Water Valve*

*Table 19 - Asset Operation - Water Valve*

<b>Operational Activities</b>	<b>Schedule</b>	<b>Unit of Measurement</b>
Operate Valve Open to Close to Open	Annually	Per Valve

## Asset Renewal and Maintenance Schedule

Each asset class in the Municipality of Dufferin's Asset Register shall have a maintenance program developed that includes a schedule of routine maintenance strategies as well as capital interventions.

## Facilities

Each asset belonging to the Facilities Asset Class shall have a customized renewal and maintenance schedule, and asset deterioration curves.

## Fleet and Equipment

Each asset belonging to the Fleet and Equipment will have a customized renewal and maintenance schedule and asset deterioration curve.

## Land and Land Improvements

*Table 20 - Renewal and Maintenance - Parking Lots (Gravel)*

Parking Lots (Gravel)							
Treatment	Maintenance/ Renewal	Max # of Treatments	Trigger Condition	Max Condition Gain	Threshold (Best Achievable Condition)	Anticipated Asset Age	Units of Costs
Add Gravel	Renewal	50	3	1	2	Annually	Square Meter
Reshape	Maintenance	50	3	1	2	Annually	Square Meter
Replace	Renewal	N/A	5	4	1	50 Years	Square Meter

## Transportation

*Table 21 - Renewal and Maintenance - Road Surface - Paved Roads (Gravel)*

Road Surface – Paved Roads (Gravel)							
Treatment	Maintenance/ Renewal	Max # of Treatments	Trigger Condition	Max Condition Gain	Threshold (Best Achievable Condition)	Anticipated Asset Age	Units of Costs
Grade/Reshape	Maintenance	1	2	1	1	Annually	Linear Meter
Add Gravel	Renewal	1	3	1	2	Annually	Linear Meter
Reshape	Maintenance	1	3 (At time of adding gravel)	1	2	Annually	Linear Meter
Replace	Renewal	N/A	5	4	1	50 Years	Linear Meter

*Table 22 - Renewal and Maintenance - Road Base*

Road Base							
Treatment	Maintenance/ Renewal	Max # of Treatments	Trigger Condition	Max Condition Gain	Threshold (Best Achievable Condition)	Anticipated Asset Age	Units of Costs
Repack	Renewal	1	Time of Asphalt Resurfacing		1	40 Years	Linear Meter
Asset Replacement	Renewal	N/A	Time of Second Asphalt Resurfacing		1	80 Years	Linear Meters

Table 23 - Renewal and Maintenance - Road Subbase

Road Subbase							
Treatment	Maintenance/ Renewal	Max # of Treatments	Trigger Condition	Max Condition Gain	Threshold (Best Achievable Condition)	Anticipated Asset Age	Units of Costs
Asset Replacement	Renewal	N/A	Same Time as Scheduled Road Base replacement, & Second Road Surface Replacement		1	80 Years	Linear Meter

## Water Distribution

Table 24 - Renewal and Maintenance - Water Main Valve

Water Main Valve							
Treatment	Maintenance/ Renewal	Max # of Treatments	Trigger Condition	Max Condit ion Gain	Threshold (Best Achievable Condition)	Anticipated Asset Age	Units of Costs
Asset Replacement	Renewal	N/A	3 (at same time as water main replacement	2	1	60 Years	Per Valve

## Asset Decommissioning

When an asset has reached the end of its service life for the Municipality of Dufferin, it shall dispose of the asset as outlined in the Asset Register Policy.



# Asset Planning Strategy

## Non-infrastructure solutions

Non-infrastructure solutions are actions, plans, procedures, or policies that can lower the cost or extend the life of an asset. It is recommended that the Municipality of Dufferin develop a Maintenance Management Plan to be able to plan and budget yearly maintenance activities to ensure the sustainability of its assets. It is also recommended that the Municipality of Dufferin develop a comprehensive Life Cycle Management Plan to ensure the sustainability of its owned infrastructure long into the future by planning for the entire life cycle of an asset.

The Municipality currently updates their 10-year Capital Budget Forecast annually as part of the overall municipal budget process. Staff should begin to align the 10-year Capital Budget Forecast with the proposed maintenance, renewal/rehabilitation, and replacement activities outlined below, wherever feasible.

## Maintenance Activities

Maintenance activities include regularly scheduled inspections and maintenance, or more significant repair and activities associated with unexpected events.

It is recommended that the Municipality of Dufferin consolidate all asset information for Transportation, Water Distribution, Water Control, Drainage, Fleet and Equipment, Facilities, Land and Land Improvements into an asset register. This information should include such items as location, replacement costs, condition, function, capacity, installation or in-service dates, dimensions, etc., which can be easily searchable and usable for the future. It is important that the asset register be updated on an annual or semi-annual basis to ensure the asset register is current.

## Transportation

With the development of a Maintenance Management Plan the municipality will be able to plan its maintenance activities well in advance to ensure funding is appropriately allocated. The need to plan the activity and the cost associated to keep that asset performing at functioning to be able to deliver the services it is required for.

As this plan develops a 5-year plan for maintenance on the Transportation Asset Class can be developed and incorporated into future iterations.

## Water Distribution

As the vast majority of the Water Distribution Asset Class is underground routine maintenance activities do not happen much.

## Fleet and Equipment

Each asset in the Fleet and Equipment Asset Class shall have a customized maintenance schedule. With the development of the Maintenance Management Plan the Municipality of Dufferin will be able to produce a detailed schedule of maintenance over the next 3 years and be able to incorporate that schedule into this Asset Management Plan.

## Renewal and Rehabilitation Activities

Renewal and Rehabilitation activities are significant repairs designed to extend the life of an asset. The following are suggested for the Municipality of Dufferin:

There are no current large renewal projects in the current 5 Year Capital Expenditure Plan and as this plan's maturity and the maturity of the maintenance management plan increase, a better forecast of the planned renewal activities can be developed and incorporated into this Asset management Plan.

With the information gathered in the Asset Register the Municipality of Dufferin will be able to quickly review assets with poor or very poor condition ratings and develop a working plan to renew or replace these assets.

## Replacement Activities

Replacement activities are activities that are expected to occur once an asset has reached the end of its useful life and renewal, or rehabilitation is no longer an option. The following are suggested for the Municipality of Dufferin:

### Transportation

There are no current replacement activities scheduled in the 5-year Capital Expenditure Plan. As the Asset Register is developed and populated with more of the Transportation assets a more detailed Replacement schedule can be developed.

### Water Distribution

Currently the closest asset needing to be replacement by the age and not of condition of the asset is not scheduled until 2036. The Municipality will ensure maintained levels of service to gather the most value from its underground assets.

### Fleet and Equipment

The Fleet and Equipment Asset Class has a lot of assets that are either due for replacement or are well past the point of needing to be replaced.

## Disposal Activities

Disposal activities are activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality. There are currently no recommended disposal activities for the Municipality of Dufferin in the Bridge or Wastewater Collection Asset Classes.

## Procurement Methods

It is recommended that the Municipality of Dufferin examine several methods of developing their capital infrastructure program going forward. This includes considering pooling projects, joint projects with neighbouring municipalities and the Provincial or Federal Governments. These methods of project planning can help the municipality optimize its capital planning process and create a better atmosphere for effective allocation of funding going forward. It may also be beneficial to add or consider including infrastructure adjacent to a planned capital infrastructure projects to reduce costs associated with mobilization and de-mobilization.

## Risks

With the execution of any plan there always comes risks. There are risks associated with this Asset Management Plan that include, limited budget, knowledge gaps and staffing capacity issues.

With a limited budget it becomes an issue of making the right decision at the right time in the areas of rehabilitation and replacement. A limited budget can also create issues maintaining the expected level of service for the community.

Knowledge gaps, although not uncommon for many municipalities, can create issues for effective decision making and collecting the appropriate data to support levels of service and their respective key performance indicators. An effective way to mitigate this risk is for the Municipality of Dufferin to retain subject matter experts from outside of the organization. These experts could be retained to complete work or to take a role of key advisor or reviewer for certain capital infrastructure projects.

Staffing capacity is also a common risk for many municipalities and ties into the risk of knowledge gaps as well. A vast majority of municipalities have finite human and financial resources and there is no expectation of this changing. The overloading of staff may result in the collection of Key Performance Indicator data becoming a lower priority than other more urgent projects. Without the KPI data being gathered in a timely manner staff will be less effective at making decisions on the most appropriate areas for rehabilitation and replacement.

This plan will be more effective if the above-mentioned risks are reviewed, addressed, and mitigated through a system of planning of projects and staffing needs to meet the capital planning needs.

## Financial Strategy

The Municipality of Dufferin provides funding for assets through 3 main sources of revenue: Utility Funding, Provincial Funding and Municipal Tax Levies. Note that this strategy assumes that there will be no change to the existing funding received through the Federal Gas Tax Program.

This Asset Management Plan has been created knowing that not all asset classes are present and only the portion of the budget pertaining to the Bridge and Wastewater asset classes have been included to the best available information. As the Asset Management Plan grows in maturity and depth other portions of the Budget will be included to reflect those additions.

### Short-Term Financial Strategy 2023-2032

For this Asset Management Plan a short-term 10 Year timeline will be used.

#### Transportation

Table 25 show the revenue and capital expenditures for Transportation Asset Class over the next 10 years.

*Table 25 - Transportation Short Term Financial Strategy*

Transportation Short Term Financial Strategy (10 Year)										Estimated Budget Increase		2.0%
Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
<b>Expenditure Data</b>												
<b>Operations</b>												
Operations Budget	\$40,000	\$40,000	\$40,800	\$41,616	\$42,448	\$43,297	\$44,163	\$45,046	\$45,947	\$46,866	\$47,804	
Management Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Operations Budget</b>	<b>\$40,000</b>	<b>\$40,000</b>	<b>\$40,800</b>	<b>\$41,616</b>	<b>\$42,448</b>	<b>\$43,297</b>	<b>\$44,163</b>	<b>\$45,046</b>	<b>\$45,947</b>	<b>\$46,866</b>	<b>\$47,804</b>	
<b>Maintenance</b>												
Reactive Maintenance Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Planned Maintenance Budget	\$678,670	\$699,000	\$712,980	\$727,240	\$741,784	\$756,620	\$771,752	\$787,188	\$802,931	\$818,990	\$835,370	
<b>Total Maintenance Budget</b>	<b>\$678,670</b>	<b>\$699,000</b>	<b>\$712,980</b>	<b>\$727,240</b>	<b>\$741,784</b>	<b>\$756,620</b>	<b>\$771,752</b>	<b>\$787,188</b>	<b>\$802,931</b>	<b>\$818,990</b>	<b>\$835,370</b>	
<b>Capital Works</b>												
Renewal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Rehabilitation	\$211,500	\$151,500	\$18,300	\$24,420	\$189,417	\$0	\$0	\$0	\$0	\$0	\$0	
Replacement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,881,504	
Disposal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Capital Works Budget</b>	<b>\$211,500</b>	<b>\$151,500</b>	<b>\$18,300</b>	<b>\$24,420</b>	<b>\$189,417</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,881,504</b>	
<b>Total Expenditure Budget</b>	<b>\$930,170</b>	<b>\$890,500</b>	<b>\$772,080</b>	<b>\$793,276</b>	<b>\$973,650</b>	<b>\$799,917</b>	<b>\$815,916</b>	<b>\$832,234</b>	<b>\$848,879</b>	<b>\$865,856</b>	<b>\$2,764,677</b>	
<b>Revenue Data</b>												
Municipal Tax Levies	\$748,641	\$739,000	\$753,780	\$768,856	\$784,233	\$799,917	\$815,916	\$832,234	\$848,879	\$865,856	\$883,173	
Provincial Funding	\$181,529	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	
Utility Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Other Sources	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Revenue</b>	<b>\$930,170</b>	<b>\$890,500</b>	<b>\$905,280</b>	<b>\$920,356</b>	<b>\$935,733</b>	<b>\$951,417</b>	<b>\$967,416</b>	<b>\$983,734</b>	<b>\$1,000,379</b>	<b>\$1,017,356</b>	<b>\$1,034,673</b>	
<b>Total Deficit or Surplus</b>	<b>\$0</b>	<b>\$0</b>	<b>\$133,200</b>	<b>\$127,080</b>	<b>-\$37,917</b>	<b>\$151,500</b>	<b>\$151,500</b>	<b>\$151,500</b>	<b>\$151,500</b>	<b>\$151,500</b>	<b>-\$1,730,004</b>	

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

The short-term financial strategy shows an increase in surplus over the next ten years, however not all assets have been entered into the system and some asset in the Register have anecdotal or incorrect data. As assets are entered into the Register and the revenue is calculated with all assets involved then a truer picture of the over all costs will be clearer. It is recommended to start a yearly contribution to reserve to be prepared for the large costs of replacement when they come.

## Water Distribution

Table 26 show the revenue and capital expenditures for Water Distribution infrastructure over the next 10 years.

Table 26 - Water Distribution Short Term Financial Strategy

Water Distribution Short Term Financial Strategy (10 Year)										Estimated Budget Increase		2.0%
Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
<b>Expenditure Data</b>												
<b>Operations</b>												
Operations Budget	\$10,000	\$10,000	\$10,200	\$10,404	\$10,612	\$10,824	\$11,041	\$11,262	\$11,487	\$11,717	\$11,951	
Management Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Operations Budget</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,200</b>	<b>\$10,404</b>	<b>\$10,612</b>	<b>\$10,824</b>	<b>\$11,041</b>	<b>\$11,262</b>	<b>\$11,487</b>	<b>\$11,717</b>	<b>\$11,951</b>	
<b>Maintenance</b>												
Reactive Maintenance Budget	\$50,000	\$50,000	\$51,000	\$52,020	\$53,060	\$54,122	\$55,204	\$56,308	\$57,434	\$58,583	\$59,755	
Planned Maintenance Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Maintenance Budget</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$51,000</b>	<b>\$52,020</b>	<b>\$53,060</b>	<b>\$54,122</b>	<b>\$55,204</b>	<b>\$56,308</b>	<b>\$57,434</b>	<b>\$58,583</b>	<b>\$59,755</b>	
<b>Capital Works</b>												
Renewal	\$10,000	\$10,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Rehabilitation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Replacement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Disposal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Capital Works Budget</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b>Total Expenditure Budget</b>	<b>\$70,000</b>	<b>\$70,000</b>	<b>\$61,200</b>	<b>\$62,424</b>	<b>\$63,672</b>	<b>\$64,946</b>	<b>\$66,245</b>	<b>\$67,570</b>	<b>\$68,921</b>	<b>\$70,300</b>	<b>\$71,706</b>	
<b>Revenue Data</b>												
Municipal Tax Levies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Provincial Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Utility Funding	\$70,000	\$70,000	\$71,400	\$72,828	\$74,285	\$75,770	\$77,286	\$78,831	\$80,408	\$82,016	\$83,656	
Other Sources	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Revenue</b>	<b>\$70,000</b>	<b>\$70,000</b>	<b>\$71,400</b>	<b>\$72,828</b>	<b>\$74,285</b>	<b>\$75,770</b>	<b>\$77,286</b>	<b>\$78,831</b>	<b>\$80,408</b>	<b>\$82,016</b>	<b>\$83,656</b>	
<b>Total Deficit or Surplus</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,200</b>	<b>\$10,404</b>	<b>\$10,612</b>	<b>\$10,824</b>	<b>\$11,041</b>	<b>\$11,262</b>	<b>\$11,487</b>	<b>\$11,717</b>	<b>\$11,951</b>	

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

The Water Distribution network seems to be properly funded with the available resources. The system is still in its early stages of its life cycle and will be able to keep sustainable at the current funding rate. However, a look at the long-term forecasting may become more important as these asset will become very expensive to replace when they come due and with proper planning into reserves we can help alleviate the impact to the municipality in the future.

## Fleet and Equipment

Table 27 show the revenue and capital expenditures for Fleet and Equipment infrastructure over the next 10 years.

*Table 27 - Fleet and Equipment Short Term Strategy*

Fleet & Equipment Short Term Financial Strategy (10 Year)										Estimated Budget Increase		2.0%
Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
<b>Expenditure Data</b>												
<b>Operations</b>												
Operations Budget	\$75,000	\$75,000	\$76,500	\$78,030	\$79,591	\$81,182	\$82,806	\$84,462	\$86,151	\$87,874	\$89,632	
Management Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Operations Budget</b>	<b>\$75,000</b>	<b>\$75,000</b>	<b>\$76,500</b>	<b>\$78,030</b>	<b>\$79,591</b>	<b>\$81,182</b>	<b>\$82,806</b>	<b>\$84,462</b>	<b>\$86,151</b>	<b>\$87,874</b>	<b>\$89,632</b>	
<b>Maintenance</b>												
Reactive Maintenance Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Planned Maintenance Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Maintenance Budget</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b>Capital Works</b>												
Renewal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Rehabilitation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Replacement	\$628,768	\$422,000	\$0	\$0	\$0	\$0	\$450,000	\$0	\$0	\$0	\$0	
Disposal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Total Capital Works Budget</b>	<b>\$628,768</b>	<b>\$422,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$450,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
<b>Total Expenditure Budget</b>	<b>\$703,768</b>	<b>\$497,000</b>	<b>\$76,500</b>	<b>\$78,030</b>	<b>\$79,591</b>	<b>\$81,182</b>	<b>\$532,806</b>	<b>\$84,462</b>	<b>\$86,151</b>	<b>\$87,874</b>	<b>\$89,632</b>	
<b>Revenue Data</b>												
Municipal Tax Levies	\$447,000	\$427,000	\$435,540	\$444,251	\$453,136	\$462,199	\$471,443	\$480,871	\$490,489	\$500,299	\$510,305	
Provincial Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Utility Funding	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Other Sources	\$256,768	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	
<b>Total Revenue</b>	<b>\$703,768</b>	<b>\$497,000</b>	<b>\$505,540</b>	<b>\$514,251</b>	<b>\$523,136</b>	<b>\$532,199</b>	<b>\$541,443</b>	<b>\$550,871</b>	<b>\$560,489</b>	<b>\$570,299</b>	<b>\$580,305</b>	
<b>Total Deficit or Surplus</b>	<b>\$0</b>	<b>\$0</b>	<b>\$429,040</b>	<b>\$436,221</b>	<b>\$443,545</b>	<b>\$451,016</b>	<b>\$8,636</b>	<b>\$466,409</b>	<b>\$474,337</b>	<b>\$482,424</b>	<b>\$490,673</b>	

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

The Fleet and Equipment Asset Class has a lot of moving pieces in it for equipment replacement schedule, renewal and future costs of a volatile marketplace and internally a need for concise data being gathered on the existing equipment. It is recommended that the Municipality of Dufferin look at creating a maintenance management program for the existing equipment and gather up-to-date information on the maintenance and replacement costing of the fleet network.

## Combined Short-Term Forecast

Table 28 show the revenue and capital expenditures for the Wastewater Collection and Bridge infrastructure combined over the next 10 years.

Table 28 - Combined Short Term Financial Strategy

Combined Short Term Financial Strategy (10 Year)										Estimated Budget Increase	2.0%
Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Expenditure Data</b>											
<b>Operations</b>											
Operations Budget	\$125,000	\$125,000	\$127,500	\$130,050	\$132,651	\$135,304	\$138,010	\$140,770	\$143,586	\$146,457	\$149,387
Management Budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Operations Budget</b>	<b>\$125,000</b>	<b>\$125,000</b>	<b>\$127,500</b>	<b>\$130,050</b>	<b>\$132,651</b>	<b>\$135,304</b>	<b>\$138,010</b>	<b>\$140,770</b>	<b>\$143,586</b>	<b>\$146,457</b>	<b>\$149,387</b>
<b>Maintenance</b>											
Reactive Maintenance Budget	\$50,000	\$50,000	\$51,000	\$52,020	\$53,060	\$54,122	\$55,204	\$56,308	\$57,434	\$58,583	\$59,755
Planned Maintenance Budget	\$678,670	\$699,000	\$712,980	\$727,240	\$741,784	\$756,620	\$771,752	\$787,188	\$802,931	\$818,990	\$835,370
<b>Total Maintenance Budget</b>	<b>\$728,670</b>	<b>\$749,000</b>	<b>\$763,980</b>	<b>\$779,260</b>	<b>\$794,845</b>	<b>\$810,742</b>	<b>\$826,957</b>	<b>\$843,496</b>	<b>\$860,366</b>	<b>\$877,573</b>	<b>\$895,124</b>
<b>Capital Works</b>											
Renewal	\$10,000	\$10,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Rehabilitation	\$211,500	\$151,500	\$18,300	\$24,420	\$189,417	\$0	\$0	\$0	\$0	\$0	\$0
Replacement	\$628,768	\$422,000	\$0	\$0	\$0	\$0	\$450,000	\$0	\$0	\$0	\$1,881,504
Disposal	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Capital Works Budget</b>	<b>\$850,268</b>	<b>\$583,500</b>	<b>\$18,300</b>	<b>\$24,420</b>	<b>\$189,417</b>	<b>\$0</b>	<b>\$450,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,881,504</b>
<b>Total Expenditure Budget</b>	<b>\$1,703,938</b>	<b>\$1,457,500</b>	<b>\$909,780</b>	<b>\$933,730</b>	<b>\$1,116,913</b>	<b>\$946,046</b>	<b>\$1,414,967</b>	<b>\$984,266</b>	<b>\$1,003,951</b>	<b>\$1,024,030</b>	<b>\$2,926,015</b>
<b>Revenue Data</b>											
Municipal Tax Levies	\$1,195,641	\$1,166,000	\$1,189,320	\$1,213,106	\$1,237,369	\$1,262,116	\$1,287,358	\$1,313,105	\$1,339,367	\$1,366,155	\$1,393,478
Provincial Funding	\$181,529	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500	\$151,500
Utility Funding	\$70,000	\$70,000	\$71,400	\$72,828	\$74,285	\$75,770	\$77,286	\$78,831	\$80,408	\$82,016	\$83,656
Other Sources	\$256,768	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000
<b>Total Revenue</b>	<b>\$1,703,938</b>	<b>\$1,457,500</b>	<b>\$1,482,220</b>	<b>\$1,507,434</b>	<b>\$1,533,153</b>	<b>\$1,559,386</b>	<b>\$1,586,144</b>	<b>\$1,613,437</b>	<b>\$1,641,275</b>	<b>\$1,669,671</b>	<b>\$1,698,634</b>
<b>Total Deficit or Surplus</b>	<b>\$0</b>	<b>\$0</b>	<b>\$572,440</b>	<b>\$573,705</b>	<b>\$416,240</b>	<b>\$613,340</b>	<b>\$171,177</b>	<b>\$629,171</b>	<b>\$637,324</b>	<b>\$645,641</b>	<b>-\$1,227,380</b>

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes

These values do not include engineering fees or other project related costs.

Overall the municipality seem to have a surplus moving forward into the foreseeable future. With this outlook now is the time to ensure that the data we have is correct and that we can find ways to ensure that you are gaining as much value from the owned assets as possible. Ensuring this value gain will allow the municipality to sustain it current service levels going forward.

### Short-Term Financial Requirements

The following list of alternatives should be considered to potentially reduce the financing requirements over the next ten years:

1. The Municipality of Dufferin should develop a process to continually develop and mature this Asset Management Plan over then next few years. This would include more detailed service levels and additional condition and risk information.
2. The reduction of debt to reduce tax rate increases is viewed as a feasible option. Money borrowed today must be paid back in the future with interest. Council could establish criteria for the insurance of future debt, such as debt should be restricted to critical health and safety projects.

3. Pursue Provincial and Federal grants whenever possible. The Plan assumes no grant funding from either of these funding sources. It is reasonable to assume that funds will become available in the future from both levels of government.
4. Create a Maintenance Management Program to ensure municipality is gaining as much value of the remaining life of the assets.

## Long-Term Financial Strategy 2023-2072

For this Asset Management Plan a long-term 50-year timeline will be used and separated into decades.

### Transportation

Table 29 show the revenue and capital expenditures for Transportation infrastructure over the next 50 years.

*Table 29 - Transportation Long Term Financial Strategy*

Transportation Long Term Financial Strategy (50 Year)						
Financial Year	2022 - 2031	2032 - 2041	2042 - 2051	2052 - 2061	2062 - 2071	
<b>Expenditure Data</b>						
<b>Operations</b>						
Operations Budget	\$430,185	\$523,437	\$638,067	\$777,800	\$948,134	
Management Budget	\$0	\$0	\$0	\$0	\$0	
<b>Total Operations Budget</b>	<b>\$430,185</b>	<b>\$523,437</b>	<b>\$638,067</b>	<b>\$777,800</b>	<b>\$948,134</b>	
<b>Maintenance</b>						
Reactive Maintenance Budget	\$0	\$0	\$0	\$0	\$0	
Planned Maintenance Budget	\$7,497,155	\$9,147,065	\$11,150,221	\$13,592,058	\$16,568,643	
<b>Total Maintenance Budget</b>	<b>\$7,497,155</b>	<b>\$9,147,065</b>	<b>\$11,150,221</b>	<b>\$13,592,058</b>	<b>\$16,568,643</b>	
<b>Capital Works</b>						
Renewal	\$0	\$0	\$0	\$0	\$0	
Rehabilitation	\$595,137	\$0	\$0	\$0	\$0	
Replacement	\$0	\$12,765,140	\$1,907,892	\$2,427,868	\$0	
Disposal	\$0	\$0	\$0	\$0	\$0	
<b>Total Capital Works Budget</b>	<b>\$595,137</b>	<b>\$12,765,140</b>	<b>\$1,907,892</b>	<b>\$2,427,868</b>	<b>\$0</b>	
<b>Total Expenditure Budget</b>	<b>\$8,522,477</b>	<b>\$22,435,642</b>	<b>\$13,696,180</b>	<b>\$16,797,726</b>	<b>\$17,516,777</b>	
<b>Revenue Data</b>						
Municipal Tax Levies	\$7,957,311	\$9,670,502	\$11,788,288	\$14,369,858	\$17,516,777	
Government Funding	\$1,659,355	\$1,982,518	\$2,416,679	\$2,945,918	\$3,591,058	
Utility Funding	\$0	\$0	\$0	\$0	\$0	
Other Sources	\$0	\$0	\$0	\$0	\$0	
<b>Total Revenue</b>	<b>\$9,616,667</b>	<b>\$11,653,021</b>	<b>\$14,204,967</b>	<b>\$17,315,776</b>	<b>\$21,107,834</b>	
<b>Total Deficit or Surplus</b>	<b>\$1,094,189</b>	<b>-\$10,782,622</b>	<b>\$508,787</b>	<b>\$518,050</b>	<b>\$3,591,058</b>	

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

As stated, this forecast is funded with a 2% budget increase over the next 50 years. This may not be feasible for the municipality to maintain, and it is recommended that the municipality use the tools available to work with different scenarios for forecasting changes to the budget increases. The municipality is also relying on millions of dollars of government funding over the forecast and



should that revenue stream ever change or become unavailable the municipality will need to find ways to find the maintenance and replacement of its owned assets.

## Water Distribution

Table 30 shows the revenue and capital expenditures for Water Distribution infrastructure over the next 50 years.

Table 30 - Water Distribution Long Term Strategy

Water Distribution Long Term Financial Strategy (50 Year)					
Financial Year	2022 - 2031	2032 - 2041	2042 - 2051	2052 - 2061	2062 - 2071
<b>Expenditure Data</b>					
<b>Operations</b>					
Operations Budget	\$107,546	\$130,859	\$159,517	\$194,450	\$237,034
Management Budget	\$0	\$0	\$0	\$0	\$0
<b>Total Operations Budget</b>	<b>\$107,546</b>	<b>\$130,859</b>	<b>\$159,517</b>	<b>\$194,450</b>	<b>\$237,034</b>
<b>Maintenance</b>					
Reactive Maintenance Budget	\$537,731	\$654,297	\$797,584	\$972,250	\$1,185,168
Planned Maintenance Budget	\$0	\$0	\$0	\$0	\$0
<b>Total Maintenance Budget</b>	<b>\$537,731</b>	<b>\$654,297</b>	<b>\$797,584</b>	<b>\$972,250</b>	<b>\$1,185,168</b>
<b>Capital Works</b>					
Renewal	\$20,000	\$0	\$0	\$0	\$0
Rehabilitation	\$0	\$0	\$0	\$0	\$0
Replacement	\$0	\$1,368,875	\$932,979	\$324,095	\$18,002
Disposal	\$0	\$0	\$0	\$0	\$0
<b>Total Capital Works Budget</b>	<b>\$20,000</b>	<b>\$1,368,875</b>	<b>\$932,979</b>	<b>\$324,095</b>	<b>\$18,002</b>
<b>Total Expenditure Budget</b>	<b>\$665,278</b>	<b>\$2,154,031</b>	<b>\$1,890,080</b>	<b>\$1,490,796</b>	<b>\$1,440,204</b>
<b>Revenue Data</b>					
Municipal Tax Levies	\$0	\$0	\$0	\$0	\$0
Government Funding	\$0	\$0	\$0	\$0	\$0
Utility Funding	\$752,824	\$916,015	\$1,116,617	\$1,361,150	\$1,659,235
Other Sources	\$0	\$0	\$0	\$0	\$0
<b>Total Revenue</b>	<b>\$752,824</b>	<b>\$916,015</b>	<b>\$1,116,617</b>	<b>\$1,361,150</b>	<b>\$1,659,235</b>
<b>Total Deficit or Surplus</b>	<b>\$87,546</b>	<b>-\$1,238,016</b>	<b>-\$773,463</b>	<b>-\$129,645</b>	<b>\$219,031</b>

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies, Funding and Expenditures will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

This asset class does have some current gaps in the Asset Register however these gaps will be easy for the municipality to gather and update. With the completion of the data entry into the Water Distribution Asset Class a better forecast can be completed. Also, as the assets come to need to be replaced ensuring that the municipality is on top of rate studies and adjustments to the water rates to fund the needed maintenance and replacement requirements.

## Fleet and Equipment

Table 31 shows the revenue and capital expenditures for Fleet and Equipment infrastructure over the next 50 years.

Table 31 - Fleet and Equipment Long Term Strategy

Fleet & Equipment Long Term Financial Strategy (50 Year)					
Financial Year	2022 - 2031	2032 - 2041	2042 - 2051	2052 - 2061	2062 - 2071
<b>Expenditure Data</b>					
<b>Operations</b>					
Operations Budget	\$806,597	\$981,445	\$1,196,376	\$1,458,375	\$1,777,751
Management Budget	\$0	\$0	\$0	\$0	\$0
<b>Total Operations Budget</b>	<b>\$806,597</b>	<b>\$981,445</b>	<b>\$1,196,376</b>	<b>\$1,458,375</b>	<b>\$1,777,751</b>
<b>Maintenance</b>					
Reactive Maintenance Budget	\$0	\$0	\$0	\$0	\$0
Planned Maintenance Budget	\$0	\$0	\$0	\$0	\$0
<b>Total Maintenance Budget</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Capital Works</b>					
Renewal	\$0	\$0	\$0	\$0	\$0
Rehabilitation	\$0	\$0	\$0	\$0	\$0
Replacement	\$1,500,768	\$0	\$0	\$0	\$0
Disposal	\$0	\$0	\$0	\$0	\$0
<b>Total Capital Works Budget</b>	<b>\$1,500,768</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Total Expenditure Budget</b>	<b>\$2,307,365</b>	<b>\$981,445</b>	<b>\$1,196,376</b>	<b>\$1,458,375</b>	<b>\$1,777,751</b>
<b>Revenue Data</b>					
Municipal Tax Levies	\$4,612,226	\$5,587,692	\$6,811,366	\$8,303,017	\$10,121,331
Government Funding	\$0	\$0	\$0	\$0	\$0
Utility Funding	\$0	\$0	\$0	\$0	\$0
Other Sources	\$939,592	\$916,015	\$1,116,617	\$1,361,150	\$1,659,235
<b>Total Revenue</b>	<b>\$5,551,818</b>	<b>\$6,503,707</b>	<b>\$7,927,983</b>	<b>\$9,664,167</b>	<b>\$11,780,566</b>
<b>Total Deficit or Surplus</b>	<b>\$3,244,453</b>	<b>\$5,522,263</b>	<b>\$6,731,607</b>	<b>\$8,205,792</b>	<b>\$10,002,814</b>

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies, Funding and Expenditures will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

This forecast shows a large surplus all along the 50-year projection. A more extensive data gathering program will need to be undertaken to gather data on all the life cycles, maintenance costs, and replacement costs and schedules for all of the different types of assets in this class. Once this plan is created a truer picture of the sustainability of the fleet network will be understood.

### Combined Long-Term Forecast (50 Years)

Table 32 show the revenue and capital expenditures for the Wastewater Collection and Bridge infrastructure combined over the next 50 years.

Table 32 - Combined Long Term Financial Strategy

Combined Long Term Financial Strategy (50 Year)						
Financial Year	2022 - 2031	2032 - 2041	2042 - 2051	2052 - 2061	2062 - 2071	
<b>Expenditure Data</b>						
<b>Operations</b>						
Operations Budget	\$1,344,329	\$1,635,741	\$1,993,959	\$2,430,625	\$2,962,919	
Management Budget	\$0	\$0	\$0	\$0	\$0	
<b>Total Operations Budget</b>	<b>\$1,344,329</b>	<b>\$1,635,741</b>	<b>\$1,993,959</b>	<b>\$2,430,625</b>	<b>\$2,962,919</b>	
<b>Maintenance</b>						
Reactive Maintenance Budget	\$537,731	\$654,297	\$797,584	\$972,250	\$1,185,168	
Planned Maintenance Budget	\$7,497,155	\$9,147,065	\$11,150,221	\$13,592,058	\$16,568,643	
<b>Total Maintenance Budget</b>	<b>\$8,034,887</b>	<b>\$9,801,362</b>	<b>\$11,947,805</b>	<b>\$14,564,308</b>	<b>\$17,753,810</b>	
<b>Capital Works</b>						
Renewal	\$20,000	\$0	\$0	\$0	\$0	
Rehabilitation	\$595,137	\$0	\$0	\$0	\$0	
Replacement	\$1,500,768	\$14,134,015	\$2,840,871	\$2,751,963	\$18,002	
Disposal	\$0	\$0	\$0	\$0	\$0	
<b>Total Capital Works Budget</b>	<b>\$2,115,905</b>	<b>\$14,134,015</b>	<b>\$2,840,871</b>	<b>\$2,751,963</b>	<b>\$18,002</b>	
<b>Total Expenditure Budget</b>	<b>\$11,495,120</b>	<b>\$25,571,118</b>	<b>\$16,782,636</b>	<b>\$19,746,897</b>	<b>\$20,734,731</b>	
<b>Revenue Data</b>						
Municipal Tax Levies	\$12,569,538	\$15,258,195	\$18,599,654	\$22,672,875	\$27,638,108	
Government Funding	\$1,659,355	\$1,982,518	\$2,416,679	\$2,945,918	\$3,591,058	
Utility Funding	\$752,824	\$916,015	\$1,116,617	\$1,361,150	\$1,659,235	
Other Sources	\$939,592	\$916,015	\$1,116,617	\$1,361,150	\$1,659,235	
<b>Total Revenue</b>	<b>\$15,921,309</b>	<b>\$19,072,743</b>	<b>\$23,249,568</b>	<b>\$28,341,093</b>	<b>\$34,547,634</b>	
<b>Total Deficit or Surplus</b>	<b>\$4,426,189</b>	<b>-\$6,498,375</b>	<b>\$6,466,931</b>	<b>\$8,594,196</b>	<b>\$13,812,903</b>	

This chart makes assumptions listed below:

- All dollar values are in 2022 CAD
- The amount of Municipal Tax Levies will be increased by a 2% inflation rate in each future year
- Asset are replaced at the end of their useful lives
- These values are subject to change over time due to technology and material changes
- These values do not include engineering fees or other project related costs.

Overall, with proper planning and management of the municipalities owned assets are being funded at an appropriate level. As asset classes are added and the currently populated ones are added to we will see a better picture of sustainability of the assets that are currently being maintained. We may see large changes to the long-term forecast as these assets are added and life cycles are adjusted to suit the specific parameter of the Municipality of Dufferin.

### Long-Term Financial Requirements

The following list of alternatives should be considered to potentially reduce the financing requirements over the next fifty years:

1. Funds will be needed to complete the required fleet replacements when they come due. Start a reserve fund to start collecting interest returns as soon as possible to ensure that the least amount is needed at the time of replacement.
2. A long-term inspection schedule should be created to ensure the current condition of the Transportation and Fleet and Equipment infrastructure. With time and labour intensive inspections like this it is recommended that a rotating 5-year schedule be created and

adhered to over the next 20 – 40 years as the assets come closer to their respective end of lives and for Fleet assets a schedule be set in the type of equipment needing inspection.

3. Ensure that policies and procedures are in place for the assets maintenance requirements to set these for future councils to understand the importance of proper maintenance in the delivery of value out of the municipalities assets.

## Asset Management Plan Improvement

As this is the first Asset Management Plan that the Municipality of Dufferin has created there are gaps in its entirety. The Municipality of Dufferin has developed an Asset Management Strategy that describes a 5-year plan to increase its maturity in Asset Management practices and procedures. However, directly related to this Asset Management Plan it is recommended that the municipality undertake the following activities:

1. Continue adding Asset Classes to the Asset Management Plan to get a more complete State of Infrastructure Report Ensure the most up to date information is gathered and reported into the Asset Register.
2. Continue developing Levels of Service for the Asset Classes as they data is being gathered and these Asset Classes are being added to the Asset Management Plan. Finding Key Performance Indicators for these Levels of Service that are underdeveloped right now.
3. Work with the Life Cycle Management portion of this plan and create documentation that describes the costs per unit for all items described in this section.
4. Continue developing the municipalities understanding of the financial strategies for the short and long terms. Being able to gather the most value from an asset and finding the needed resources available when required will take time to determine. However, with the addition of the Life Cycle Management portion of this Asset Management Plan we will be able to better understand the operational costs associated with operating the assets that they currently own and how they will be able to place money in reserves for their replacement.