Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

# REPORT

## Township of Wilmot

Asset Management Plan

**December 2013**

CANADA'S BEST MANAGED COMPANIES

# Executive Summary

Associated Engineering (Ont.) Ltd., along with TCA Consulting Ltd., was retained by the Township of Wilmot to complete a comprehensive Asset Management Plan (AMP). The approach for this AMP was in accordance with the Ministry of Infrastructure (MOI) "Building Together" guide. This guide defines an AMP as "a strategic document that states how a group of assets is to be managed over a period of time."

The MOI "Building Together" guide provides a framework for all Ontario municipalities to establish a municipal infrastructure strategy and an asset management plan that will guide municipal infrastructure investment. The approach is collaborative amongst all three levels of government—the province, municipalities, and the federal government—in order to address the challenges of current and emerging infrastructure needs.

Key elements of an asset management plan as prescribed in the MOI guidelines are as follows:

1. Executive summary
2. Introduction
3. State of local infrastructure
4. Desired levels of service
5. Asset management strategy
6. Financing strategy

Associated Engineering (AE) employed the MOI guidelines to direct the project and produce a comprehensive plan for the Township. The plan focusses on key civil infrastructure assets as prescribed by the Township; these include bridges, roads, and underground (water, sewer, and stormwater pipes).

The AMP outlines the characteristics and conditions of the Township's infrastructure assets and the levels of service expected from 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 AMP will be used to help determine when specific individual assets need to be replaced and when to allocate funds within the overall capital budget.

AE worked alongside Township Staff to consolidate and analyze data to determine the overall condition and state of the assets included under the plan. As a result, an Infrastructure Report Card was created to summarize the overall condition of the assets.
In general the Township's infrastructure assets evaluated as part of preparing this Asset Management Plan are in good shape and are younger when compared with many other areas of the Province.
As highlighted in the recommendations summary below, the Township is currently undertaking many practices to preserve and maintain their infrastructure, our recommendations are focused on improvements and optimization of these activities.

| Asset | Rating | Grade |
|---|---|---|
| Water Infrastructure | 6.35 | Fair |
| Wastewater Infrastructure | 6.15 | Fair |
| Storm Infrastructure | 7.17 | Good |
| Road Infrastructure | 7.39 | Good |
| Bridge Infrastructure | 7.08 | Good |

AE conducted a level of service workshop with Township Staff to develop level of service standards and accompanying Key Performance Indicators (KPIs) for all asset classes included under the plan.

| Asset Class | KPI | Measured By | Comments |
|---|---|---|---|
| Roads | Condition | Pavement Condition Index (PCI) | |
| | Cost | Annual operating costs for hard surface roads | |
| | Impact of Failure | Annual Average Daily Traffic (AADT) | |
| Bridges | Condition | Bridge Condition Index (BCI) based on OSIM inspection | |
| | Cost | Bi-Annual Appraisal Reports | |
| | Impact of Failure | AADT based on OSIM inspection*<br>Detour route based on OSIM inspection* | |
| Storm Sewer | Performance | No. of *flooding on road* incidents per annum | |
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on upstream sections, general indication of number served |
| | Condition | CCTV/PACP condition rating or Age & Material* | Inspection frequency based on previous condition rating or Age & Material |
| Watermains | Performance | No. of breaks per annum;<br>No. of water quality incidents; | |

| Asset Class | KPI | Measured By | Comments |
|---|---|---|---|
| | | Fire Flow / Available Pressure* | |
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on downstream sections, general indication of number served |
| | Condition | Age & Material* | |
| Sanitary Sewers | Performance | No. blockages per annum | |
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on upstream sections, general indication of number served |
| | Condition | CCTV/PACP condition rating or Age & Material* | Inspection frequency based on previous condition rating or Age & Material |

* KPI suggested by AE.

The development of the AMP has resulted in a number of benefits, some of which are outlined below:

1. The AMP provides an excellent baseline to measure against and build on going forward;
2. The AMP satisfies the MOI requirements and guidelines;
3. The project has produced a consolidated inventory of infrastructure assets including a GIS deliverable for accessing information via a mapping interface;
4. The AMP includes advanced financial analysis for capital and operational planning; and
5. The AMP provides a series of recommendations summarized in the table below.

| | | Recommendation Summary |
|---|---|---|
| Asset Management Strategy | Non-Infrastructure Solutions | 1. Consider undertaking an Infrastructure Master Plan<br>2. * Align 10-Year Forecast with proposed maintenance, renewal/rehabilitation, and replacement activities. Continue this with bridges and begin alignment with roads and underground infrastructure. |
| | Maintenance Activities | 1. * Compile all asset information for roads, bridges, and underground infrastructure into a database<br>2. * Continue bridge OSIM inspections every two years<br>3. * Formalized Road Inspection Program to collect PCI & AADT<br>4. * CCTV Inspection Program for underground infrastructure via a reputable contractor certified in current inspection standards |
| | Renewal/ Rehabilitation | 1. * Continue implementing bridge rehabilitation recommendations from OSIM Inspections<br>2. * Continue road rehabilitation based on Road Inspection Program |

| | | Recommendation Summary |
|---|---|---|
| | Activities | 3. * Continue spot repairs for underground infrastructure based on CCTV Inspection Program along with Inflow & Infiltration studies |
| | Replacement Activities | 1. * Continue implementing bridge replacement recommendations based on OSIM Inspections provide recommendations on bridge replacement activities. * Undertake road replacement based Road Inspection Program, PCI & RCR scores<br>2. * Coordinate & align underground infrastructure replacement with road reconstruction and bridge program. |
| | Disposal Activities | 1. * Proper disposal of bridges, roads, and underground infrastructure should continue to occur |
| | Expansion Activities | 1. * Ensure Baden and New Hamburg's water and wastewater networks can accommodate the expected growth over the next 10 years.<br>2. * Update water and sewer models and complete a hydraulic assessment to ensure all systems are under capacity and have capacity available for expansion. The Township should receive a copy of all modelling exercises in their specified format.<br>3. * Utilize the Region of Waterloo's water and sewer models |
| | Procurement Methods | 1. * Coordinate adjacent infrastructure projects with neighbouring municipalities and the Region of Waterloo<br>2. Right-of-way view based on spatial analysis and GIS tools to look at asset proximity and adjacency when developing the in-year capital program |
| | Risk | 1. * Continue hiring subject matter experts to review work completed by Township or clients to ensure the consistency in deliverables |
| Financial Strategy | Short-Term Financing | 1. * Continue to revise and adjust the Implementation Strategy to improve the Financial Strategy<br>2. Establish criteria for the issuance of future debt<br>3. * Continue to pursue Provincial and Federal grants whenever possible |
| | Long-Term Financing | 1. * Review & complement existing levels of service and establish performance metrics to track how well the infrastructure is meeting the service levels<br>2. * Collect and review additional condition/performance information for the Municipality's infrastructure to better assess the probability of failure<br>3. * Consider non-infrastructure solutions to achieve service levels. Consider consolidating or eliminating redundant infrastructure. |

*Denotes recommendations and activities currently undertaken by Township staff

This AMP is intended to set a baseline and is not intended to replace the 10-Year Capital Forecast. It is a living document that should be updated every five years to adjust the baseline and compliment the 10-Year Capital Forecast.

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# 1 Introduction

In 2013, the Township of Wilmot endorsed a Strategic Plan to help guide their decision-making process over the next 20 years. The Township of Wilmot Strategic Plan defines the following four goals:

1. We enjoy our quality of life
2. We are an engaged community
3. We have a prosperous economy
4. We protect our natural environment

One of the many strategies toward achieving these goals includes “maintaining our infrastructure.” The creation and proper utilization of an Asset Management Plan (AMP) aligns with the Township’s Strategic Plan and will help the municipality to achieve its goal of a prosperous economy and its mission “to evolve and grow as a community of caring people working together to build upon a sure foundation.”

In April 2013, Associated Engineering (Ont.) Ltd (AE), along with TCA Consulting Ltd., was retained by the Township of Wilmot to develop a comprehensive Asset Management Plan for the Township focussing on roads, bridges, and underground infrastructure. The approach for this AMP was in accordance with the Ministry of Infrastructure (MOI) “Building Together” guide. This guide defines an AMP as “a strategic document that states how a group of assets is to be managed over a period of time.”

This plan contains the following standard sections: Executive Summary, Introduction, State of Local Infrastructure, Expected Levels of Service, Asset Management Strategy, and Financing Strategy. The AMP outlines the characteristics and conditions of the Township’s infrastructure assets and the levels of service expected from 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 AMP will be used to help determine when specific individual assets need to be replaced and when to allocate funds within the overall capital budget.

While the delivery of municipal services is coordinated between the upper-tier Region of Waterloo and lower-tier Township of Wilmot, the Township is responsible for planning and development services, recreation services, road and sidewalk provision and maintenance, fire protection, water distribution, sanitary collection, and storm water management. As noted, the scope of this AMP was limited to the assets owned by the Township, with a specific focus on roads, bridges, and underground infrastructure (sanitary, stormwater, and water mains).

This AMP was developed by engineers and consultants from AE, who worked closely alongside the Township of Wilmot’s Public Works and Finance Departments. This AMP 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 Township-owned infrastructure.

The creation of this AMP will further refine the Township's long-term capital planning and funding and bring a focus to maintaining a consistent level of service for the community that is customer focussed and financially and logistically achievable.

# 2 State of Local Infrastructure

## 2.1 ASSET INVENTORY

This section of the AMP covers all existing roads, bridges, and underground infrastructure owned by the municipality. The data for this inventory was gathered from existing Public Works databases, GIS data, and on-site data gathering and analysis by AE and Wilmot staff. The asset inventory has been consolidated into spreadsheets and a Manifold GIS file so that it can be represented spatially.

All asset inventory spreadsheets can be found in Appendix A.

### 2.1.1 Water

The Township of Wilmot has approximately 71 km of water infrastructure located in Baden, New Dundee, New Hamburg, and St. Agatha. The average expected life cycle of water pipe is 75 years. This represents a standard engineering average considering all material and diameter types. It is a reasonable assumption for this level of analysis and for the size and population of Wilmot. Currently, the average age of pipe is 23 years. The oldest water pipe was installed in 1952, and the newest water pipe installed in 2012. A distribution of water infrastructure installation years is shown in **Figure 2-1**.

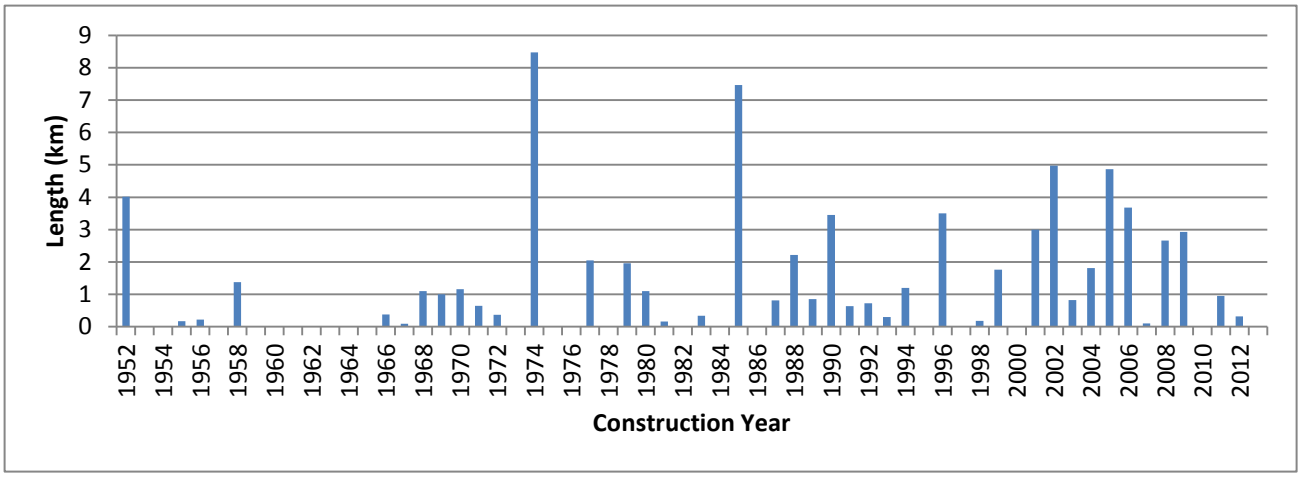



**Figure 2-1: Age of Water Infrastructure**

The majority of water distribution pipes in Wilmot are PVC installed in the past 25 years, as shown below in **Table 2-1**.

**Table 2-1: Water Age and Material (km)**

| Material | 0-25 Years | 25-50 Years | 50-75 Years | Total |
|---|---|---|---|---|
| Asbestos Cement | - | 4.86 km | 1.55 km | **6.41 km** |
| Cast Iron | 0.14 km | 1.14 km | 3.26 km | **4.54 km** |
| Copper | - | - | 0.78 km | **0.78 km** |
| Ductile Iron | 1.18 km | 5.46 km | 0.20 km | **6.84 km** |
| Polyethylene | 0.29 km | - | - | **0.29 km** |
| PVC | 39.34 km | 13.00 km | - | **52.34 km** |
| **Total** | **40.95 km** | **24.26 km** | **5.79 km** | **71.20 km** |

The majority of water distribution pipes in the Township of Wilmot are 150 mm, as indicated in **Figure 2-2** below.

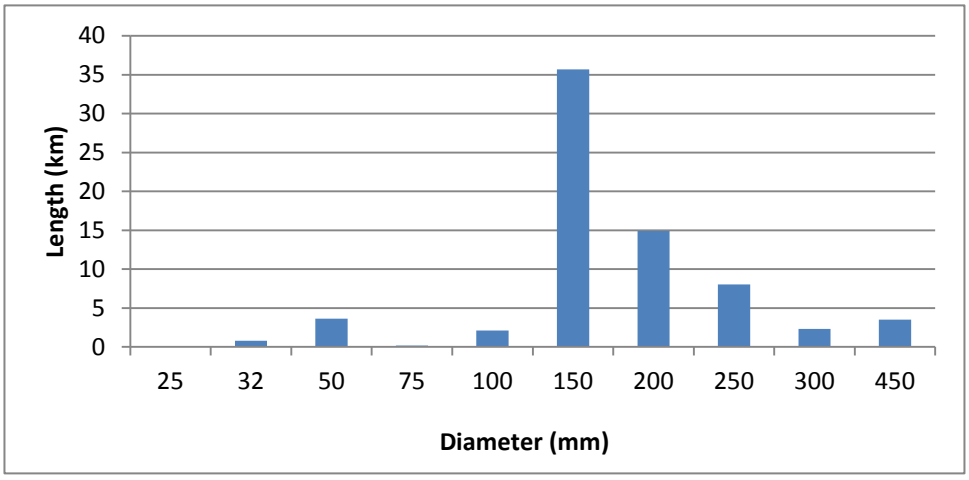



**Figure 2-2: Water Infrastructure Diameter**

### 2.1.2 Wastewater

The Township of Wilmot has approximately 56 km of wastewater infrastructure located in Baden and New Hamburg. The average expected life cycle of wastewater pipe is 75 years. This represents a standard engineering average considering all material and diameter types. It is a reasonable assumption for this level of analysis and for the size and population of Wilmot. Currently, the average age of pipe is 24 years. The oldest wastewater pipe was installed in 1961, and the newest wastewater pipe installed in 2012. A distribution of wastewater infrastructure installation years is shown in **Figure 2-3**.

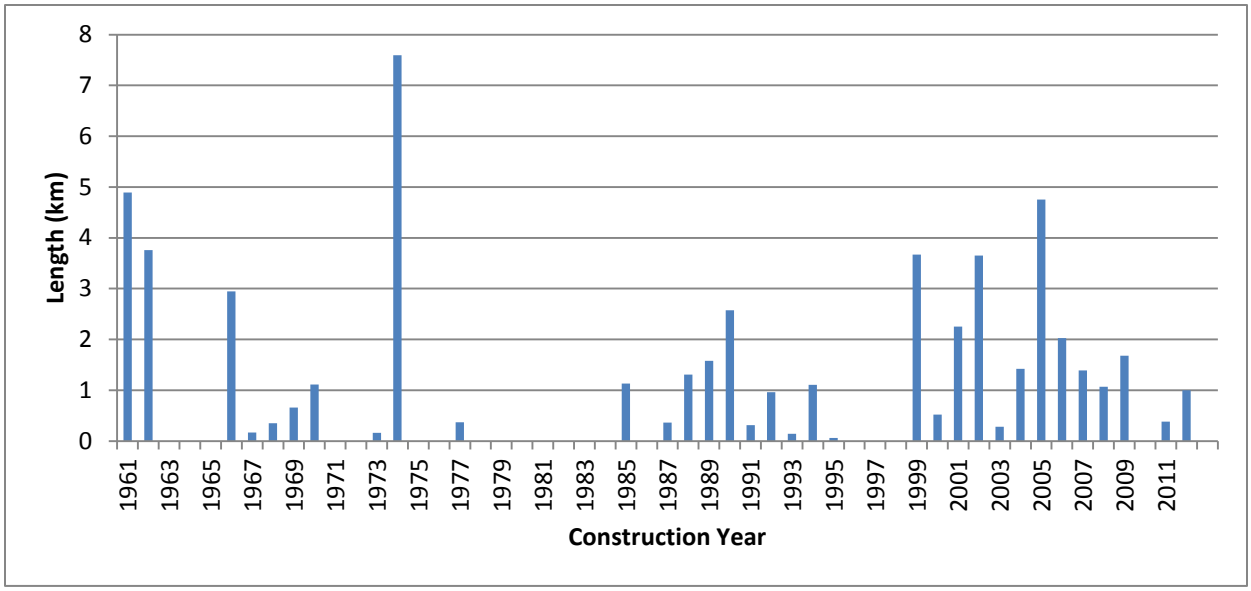



**Figure 2-3: Age of Wastewater Infrastructure**

The majority of wastewater pipes are PVC, installed in the last 25 years, as shown below in **Table 2.2**.

**Table 2-2: Wastewater Age and Material (km)**

| | 0-25 Years | 26-50 Years | 51-75 Years | Total |
|---|---|---|---|---|
| Asbestos Cement | 0.19 km | 9.39 km | - | **9.58 km** |
| Concrete | 0.39 km | 3.50 km | 6.08 km | **9.97 km** |
| Ductile Iron | - | 0.07 km | - | **0.07 km** |
| PVC | 31.45 km | 1.87 km | 0.81 km | **34.13 km** |
| Transite | - | 0.04 km | - | **0.04 km** |
| Vitrified Clay | 0.17 km | 0.03 km | 1.76 km | **1.96 km** |
| **Total** | **32.20 km** | **14.90 km** | **8.65 km** | **55.75 km** |

The majority of wastewater collection pipes in the Township of Wilmot are 200 mm, as indicated in **Figure 2-4** below.

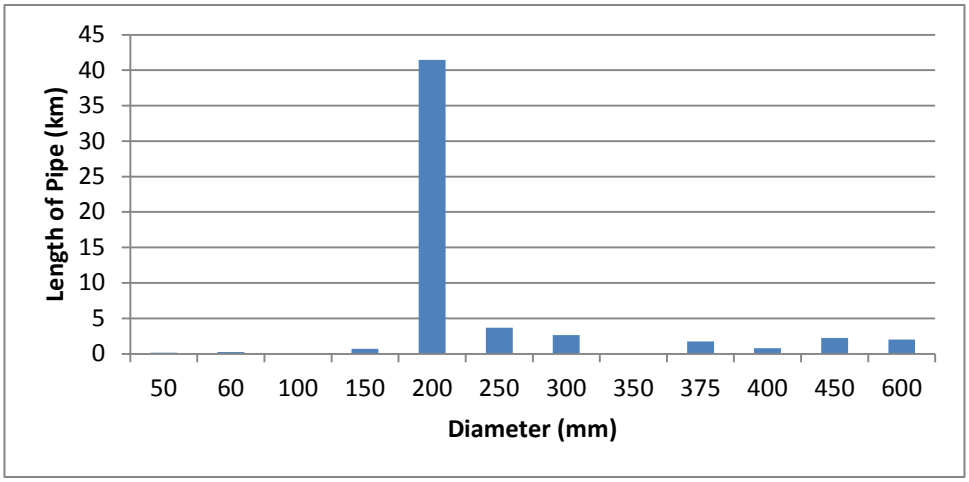



Figure 2-4: Wastewater Infrastructure Diameter

### 2.1.3 Stormwater

The Township of Wilmot has approximately 60 km of stormwater infrastructure located in Baden, New Hamburg, New Dundee, Petersburg, and St. Agatha. While best efforts were made to obtain a complete database of underground infrastructure, data relating to part of the stormwater system is deficient. Therefore, these pipes were excluded from **Figure 2-5** and shown as "unknown" in **Table 2-3** and **Figure 2-6**. The average expected life cycle of stormwater pipe is 75 years. This represents a standard engineering average considering all material and diameter types. It is a reasonable assumption for this level of analysis and for the size and population of Wilmot. Currently, the average age of pipe is 14 years. The oldest stormwater pipe was installed in 1970, and the newest stormwater pipe installed in 2012. A distribution of stormwater infrastructure installation years is shown in **Figure 2-5**.

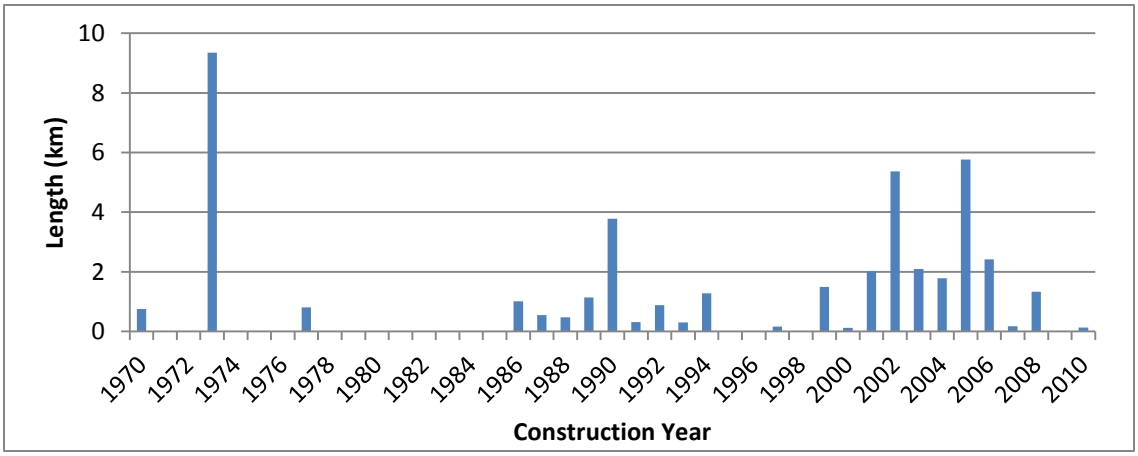



Figure 2-5: Age of Storm Infrastructure

The majority of stormwater collection pipes are concrete, installed in the past 25 years, as shown below in **Table 2.3**.

**Table 2-3: Stormwater Age and Material (km)**

| | 0-25 Years | 25-50 Years | Unknown | Total |
|---|---|---|---|---|
| Concrete | 18.86 km | 10.83 km | 5.80 km | **35.49 km** |
| CSP | 0.17 km | 1.63 km | 1.78 km | **3.58 km** |
| PVC | 12.00 km | - | 1.78 km | **13.78 km** |
| Unknown | - | - | 7.39 km | **7.39 km** |
| **Total** | **31.03 km** | **12.46 km** | **16.75 km** | **60.24 km** |

The majority of stormwater distribution pipes in the Township of Wilmot are 300 mm, as indicated in **Figure 2-6** below.

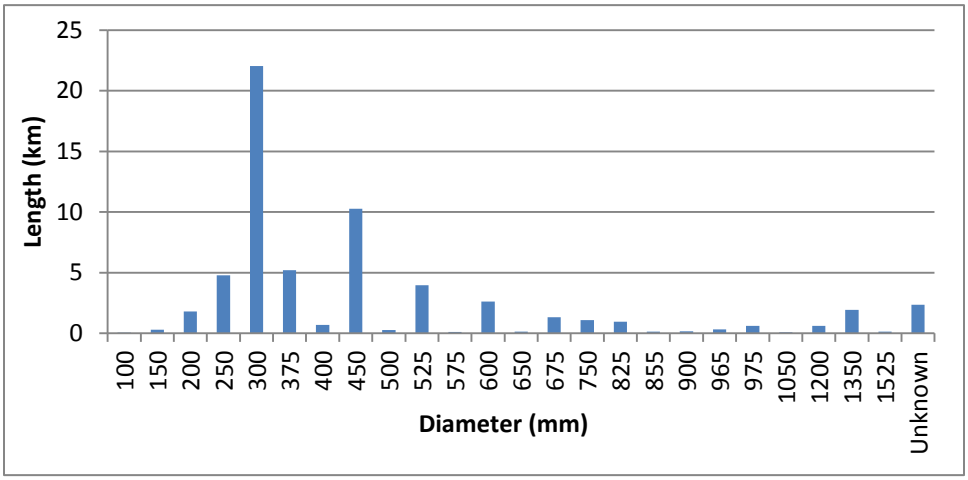



**Figure 2-6: Storm Infrastructure Diameter**

### 2.1.4 Roads

The Township of Wilmot has approximately 220 km of paved road and 56 km of gravel road. For full road reconstruction, the average expected life cycle of paved road is 25 years and the expected lifecycle of a gravel road is 5 years. This represents a standard engineering average considering standard material deterioration. It is a reasonable assumption for this level of analysis and for the size and population of Wilmot. Condition of roads is based on a measure of pavement condition (PCI). AE completed field data collection to support the AMP analysis.

Shown below in **Figure 2-7** is the length of road paved each year. As indicated in **Figure 2-7**, 5.5 km of roads have reached the end of their 25-year life cycle as they were paved from 1972 to 1988. Within the

past 25 years, approximately 200 km of road throughout the Township of Wilmot has been paved. The average age of paved road in Wilmot is 11 years, and as indicated below in **Figure 2-7**, 2006 was the year the greatest amount of pavement was installed.

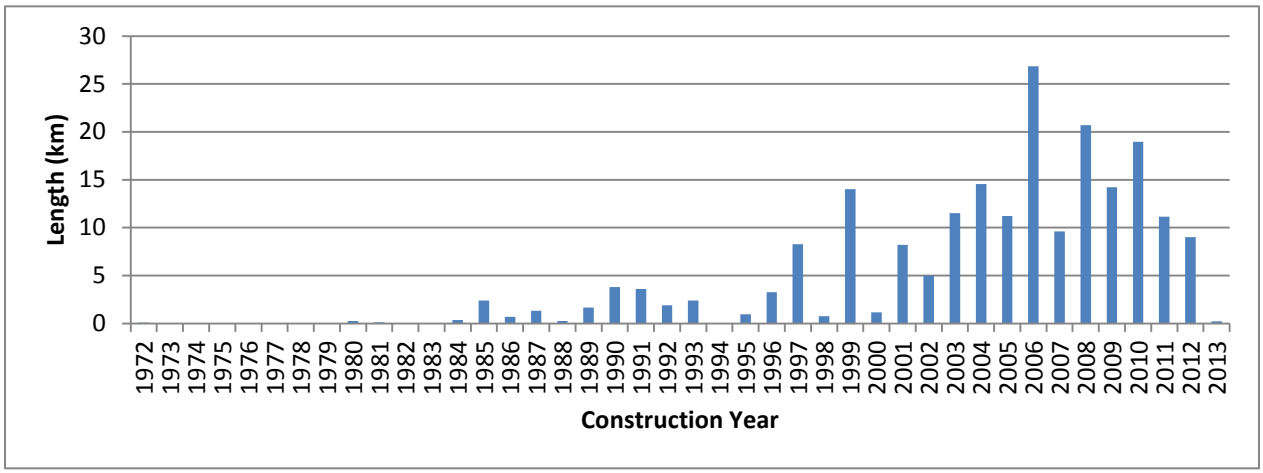



**Figure 2-7: Age of Road Infrastructure**

The Township supports three road surfaces – tar & chip, asphalt, and gravel. **Figure 2-8** below shows a breakdown of Wilmot's road types by length. The majority of Wilmot's roads are tar & chip and asphalt.

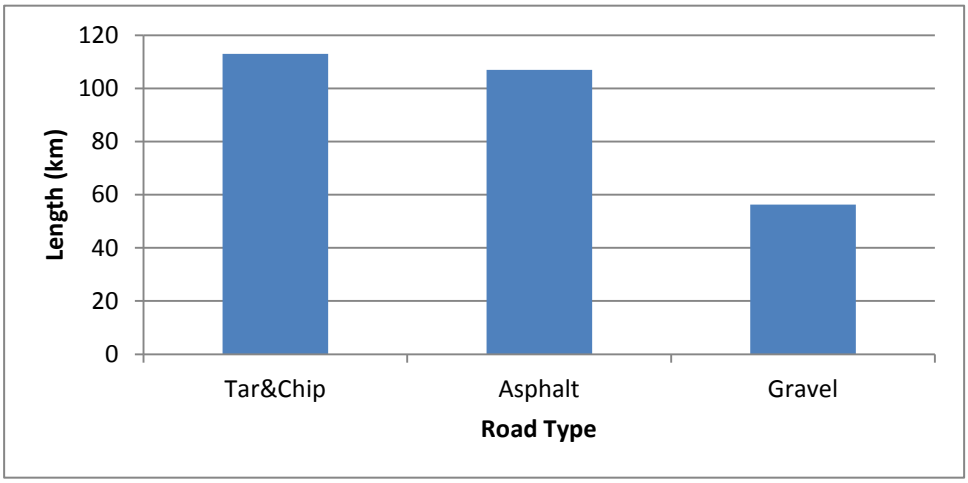



**Figure 2-8: Wilmot's Roads by Type**

### 2.1.5 Bridges

There are 38 bridges and culverts in the Township of Wilmot. The average life expectancy is 60 years for bridges built prior to 1970 and 75 years for bridges built after 1970. The average age of Wilmot's bridges and culverts is 47 years. **Figure 2-9** below shows the age of Wilmot's bridges.

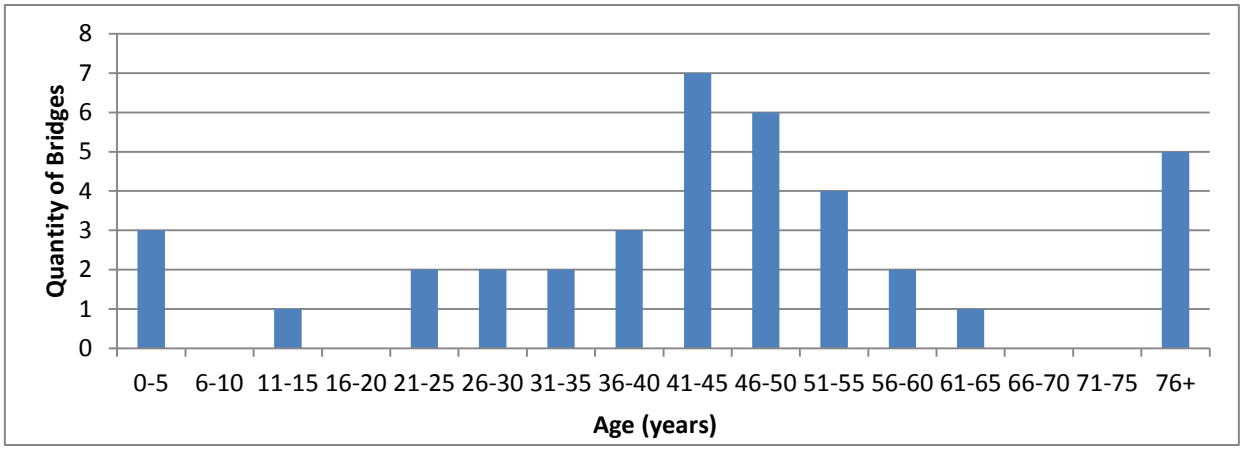



**Figure 2-9: Age of Bridge Infrastructure**

## 2.2 FINANCIAL VALUATION

This section outlines the value of the Township of Wilmot's current infrastructure and the cost to replace the infrastructure once it reaches the end of its useful life cycle. The following formulas are used throughout the Financial Valuation section:

Current Replacement Cost (CRC):

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

Depreciated Value (DV):

$$DV = \frac{CRC * remaining\ life}{average\ lifecycle\ of\ infrastrucutre}$$

Future Replacement Cost (FRC): cost to replace infrastructure once it reaches the end of its life cycle

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

Where: CRC is Current Replacement Cost
$i$ is the inflation rate per year (3%)
$n$ is the remaining infrastructure life in years

Investment Required (IR):

$$IR = \frac{FRC}{(1+i)^n}$$

Where: FRC is the Future Replacement Cost
$i$ is the rate of return per year (6%)
$n$ is the remaining infrastructure life in years

All financial calculations were done within Excel spreadsheets. Copies of these can be found in Appendix B.

### 2.2.1 Water

The following section describes the methodology employed to determine water infrastructure costing.

#### 2.2.1.1 Assumptions

Some general assumptions applied to determine water infrastructure costing are below:

- Quantity calculation based on a 300 m piece of road including one (1) intersection where it was assumed an average would include 2 fire hydrants and 4 gate valves
- Price includes excavation, supply, and installation of pipe, fire hydrants, and valve boxes
- Price includes excavation, supply, and installation of water services to property line (assumed 60′ lot frontage as an overall Township average, therefore 11 services per 100 m)
- Price does not include engineering fees or removal and temporary watermain
- Price based on generic depth; however price could fluctuate depending on depth of cut
- Price is based on current practices, technology and materials for similar replacement

#### 2.2.1.2 Costs

**Table 2-4** below shows the cost to replace one metre of watermain for all pipe diameters used in the Township of Wilmot.

**Table 2-4: Cost per Metre for Watermain Installation**

| Watermain Size (mm) | Cost per Metre (Pipe Only) | Cost per Metre (Full Construction) |
|---|---|---|
| 150 | $ 370.00 | $643.00 |
| 200 | $ 410.00 | $683.00 |
| 300 | $ 460.00 | $733.00 |
| 400 | $ 510.00 | $783.00 |

**Table 2-5** shows the Current Replacement Cost, the Current Asset Value (or the depreciated value), the Future Replacement Cost (inflated to the year the asset should be replaced), and the Investment Required based on five-year increments relating to the year each pipe reaches the end of its useful life cycle. Based on the table, the Township of Wilmot's water distribution system has a current asset value of approximately 18.8 million dollars.

**Table 2-5: Financial Valuation for Wilmot's Water Network**

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| 2026 | 2030 | $ 2,520,922.23 | $ 258,782.17 | $ 3,825,600.31 | $ 1,681,634.76 |
| 2031 | 2035 | $ 1,050,394.78 | $ 161,746.64 | $ 1,884,964.83 | $ 595,439.24 |
| 2036 | 2040 | $ - | $ - | $ - | $ - |
| 2041 | 2045 | $ 2,371,068.19 | $ 556,667.57 | $ 5,875,928.95 | $ 983,227.35 |
| 2046 | 2050 | $ 6,391,779.66 | $ 1,811,289.24 | $ 18,381,597.36 | $ 2,292,316.35 |
| 2051 | 2055 | $ 1,622,830.63 | $ 495,629.20 | $ 5,193,156.69 | $ 524,596.60 |
| 2056 | 2060 | $ 4,710,364.03 | $ 1,581,521.35 | $ 18,803,149.42 | $ 1,228,311.16 |
| 2061 | 2065 | $ 4,849,785.03 | $ 1,934,805.38 | $ 21,883,367.95 | $ 1,123,463.91 |
| 2066 | 2070 | $ 1,900,443.98 | $ 814,762.76 | $ 9,576,369.31 | $ 395,566.32 |
| 2071 | 2075 | $ 4,123,873.80 | $ 2,071,090.34 | $ 23,548,363.17 | $ 760,406.02 |
| 2076 | 2080 | $ 10,349,426.07 | $ 5,305,020.93 | $ 70,782,676.19 | $ 1,602,389.69 |
| 2081 | 2085 | $ 6,177,531.62 | $ 3,357,653.24 | $ 48,257,515.09 | $ 840,037.57 |
| 2086 | 2090 | $ 807,103.22 | $ 448,969.79 | $ 7,033,329.02 | $ 98,573.34 |
| Total | | $ 46,875,523.24 | $ 18,797,948.61 | $ 235,046,018.29 | $ 12,125,962.31 |

*Note: No watermain infrastructure will reach the end of its useful life between 2036 & 2040 therefore cells are left blank

### 2.2.2 Wastewater

The following section describes the methodology employed to determine wastewater infrastructure costing.

#### 2.2.2.1 Assumptions

Some general assumptions applied to determine wastewater infrastructure costing are listed below:

- One manhole per 100 m
- Price includes excavation, supply, and installation of pipe and manhole structures
- Price includes excavation, supply, and installation of sanitary sewer services to property line (assumed 60′ lot frontage as an overall Township average, therefore 11 services per 100 m)
- Price does not include engineering fees removal and maintaining existing flows
- Assumed Sanitary Sewer depth of 3 m; price could fluctuate depending on depth of cut
- Price is based on current practices, technology and materials for similar replacement

#### 2.2.2.2 Costs

**Table 2-6** below shows the cost to replace one metre of wastewater pipe for all diameters used in the Township of Wilmot.

**Table 2-6: Cost per Metre for Wastewater Installation**

| San Trunk Size (mm) | Cost per Metre (Pipe Only) | Cost per Metre (Full Construction) |
|---|---|---|
| 200 | $375.00 | $ 648.00 |
| 250 | $380.00 | $ 653.00 |
| 300 | $390.00 | $ 663.00 |
| 375 | $395.00 | $ 668.00 |
| 450 | $435.00 | $ 708.00 |
| 600 | $455.00 | $ 728.00 |

**Table 2-7** shows the Current Replacement Cost, the Current Asset Value (or the depreciated value), the Future Replacement Cost (inflated to the year the asset should be replaced), and the Investment Required based on five-year increments relating to the year each pipe reaches the end of its useful life cycle. Based on the table, the Township of Wilmot's wastewater distribution system has a current asset value of approximately 13.8 million dollars.

**Table 2-7: Financial Valuation for Wilmot's Wastewater Network**

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| 2036 | 2040 | $ 5,630,645.52 | $ 1,021,050.13 | $ 11,257,167.40 | $ 2,873,525.92 |
| 2041 | 2045 | $ 3,357,318.21 | $ 754,216.18 | $ 8,008,502.72 | $ 1,446,474.71 |
| 2046 | 2050 | $ 5,097,939.90 | $ 1,430,356.31 | $ 14,766,496.49 | $ 1,814,599.69 |
| 2051 | 2055 | $ 237,530.88 | $ 71,479.20 | $ 752,266.71 | $ 77,525.24 |
| 2056 | 2060 | $ 733,412.88 | $ 265,975.35 | $ 2,942,375.49 | $ 190,249.02 |
| 2061 | 2065 | $ 3,863,220.63 | $ 1,538,238.32 | $ 17,497,729.97 | $ 891,404.64 |
| 2066 | 2070 | $ 1,689,243.77 | $ 716,419.45 | $ 8,553,062.64 | $ 349,935.03 |
| 2071 | 2075 | $ 2,844,805.43 | $ 1,385,559.10 | $ 17,324,589.58 | $ 492,048.54 |
| 2076 | 2080 | $ 7,928,686.93 | $ 3,963,678.97 | $ 54,604,481.24 | $ 1,219,496.24 |

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| 2081 | 2085 | $ 4,012,163.29 | $ 2,155,730.76 | $ 31,219,856.14 | $ 547,560.13 |
| 2086 | 2090 | $ 903,434.56 | $ 517,835.38 | $ 7,984,978.01 | $ 108,834.27 |
| Total | | $ 36,298,402.00 | $ 13,820,539.15 | $ 174,911,506.38 | $ 10,011,653.43 |

### 2.2.3 Stormwater

The following section describes the methodology employed to determine stormwater infrastructure costing.

#### 2.2.3.1 Assumptions

Some general assumptions applied to determine stormwater infrastructure costing are listed below:

- Pipe and structure quantity calculation based on a 200 m piece of road including 1 intersection where it was assumed an average would include 5 manholes and 5 catch basins and leads
- Price includes excavation, supply, and installation of pipe, catch basin, and manhole structures
- Price does not include engineering fees or removal of pipes being replaced
- Assumed Storm Sewer depth of 2 m; price could fluctuate depending on depth of cut

#### 2.2.3.2 Costs

**Table 2-8** below shows the cost to replace one metre of stormwater pipe for all diameters used in the Township of Wilmot.

**Table 2-8: Cost per Metre for Stormwater Pipes**

| Storm Trunk Size (mm) | Cost per Metre (Pipe Only) | Cost per Metre (Full Construction) |
|---|---|---|
| 300 | $320.00 | $ 593.00 |
| 375 | $340.00 | $ 613.00 |
| 400 | $345.00 | $ 618.00 |
| 450 | $360.00 | $ 633.00 |
| 525 | $365.00 | $ 638.00 |
| 600 | $370.00 | $ 643.00 |
| 675 | $440.00 | $ 713.00 |
| 750 | $490.00 | $ 763.00 |

| Storm Trunk Size (mm) | Cost per Metre (Pipe Only) | Cost per Metre (Full Construction) |
|---|---|---|
| 825 | $540.00 | $ 813.00 |
| 900 | $660.00 | $ 933.00 |
| 975 | $760.00 | $ 1,033.00 |
| 1050 | $780.00 | $ 1,053.00 |
| 1200 | $1,120.00 | $ 1,393.00 |

**Table 2-9** shows the Current Replacement Cost, the Current Asset Value (or the depreciated value), the Future Replacement Cost (inflated to the year the asset should be replaced), and the Investment Required based on five-year increments relating to the year each pipe reaches the end of its useful life cycle. Based on the table, the Township of Wilmot's stormwater distribution system has a current asset value of approximately 12.1 million dollars.

**Table 2-9: Financial Valuation for Wilmot's Stormwater Network**

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| 2041 | 2045 | $ 838,238.12 | $ 360,497.94 | $ 3,513,824.64 | $ 271,082.59 |
| 2046 | 2050 | $ 5,623,585.51 | $ 1,433,408.53 | $ 15,823,996.13 | $ 2,058,784.47 |
| 2051 | 2055 | $ 477,572.55 | $ 134,010.24 | $ 1,512,485.15 | $ 155,869.94 |
| 2056 | 2060 | $ - | $ - | $ - | $ - |
| 2061 | 2065 | $ 4,449,592.17 | $ 1,730,395.15 | $ 20,053,034.65 | $ 1,032,821.35 |
| 2066 | 2070 | $ 1,700,720.40 | $ 699,017.55 | $ 8,627,795.62 | $ 351,610.83 |
| 2071 | 2075 | $ 1,138,300.84 | $ 530,642.92 | $ 6,888,575.79 | $ 198,145.82 |
| 2076 | 2080 | $ 11,492,635.14 | $ 5,950,309.58 | $ 79,095,263.99 | $ 1,768,176.86 |
| 2081 | 2085 | $ 2,466,163.69 | $ 1,276,290.97 | $ 18,805,340.11 | $ 343,093.23 |
| UNK | UNK | $ 8,995,576.70 | $ - | $ - | $ - |
| Total | | $ 37,182,385.12 | $ 12,114,572.87 | $ 163,315,892.78 | $ 6,179,585.10 |

*Note: No stormwater infrastructure will reach the end of its useful life between 2056 and 2060 - cells are left blank intentionally.

### 2.2.4 Roads

The following section describes the methodology employed to determine road costing.

#### 2.2.4.1 Assumptions

Some general assumptions applied to determine road costing are listed below:

- Price does not include engineering costs or removal costs
- Price is for construction costs, supply, placement, and compaction
- Price is based on current practices, technology and materials for construction of similar road

#### 2.2.4.2 Costs

Costing of roads is based on Wilmot's unit replacement cost. This replacement cost is based on local market trends and past construction contract pricing.

All gravel roads are assumed to be replaced with Tar & Chip at a cost of $95.00 per metre. All existing rural asphalt roads are replaced at a cost of $90.00 per metre. All urban asphalt roads are replaced at a cost of $1,400.00 per metre. These costs include:

- preliminary geo-technical work
- asphalt and base removal
- supply, placement, and compaction of granular A and granular B
- storm system installation
- contingency for utility relocation
- supply, placement, and compaction of HL4 and HL3
- property acquisition
- legal fees

**Table 2-10** shows the Current Replacement Cost, the Current Asset Value (or the depreciated value), the Future Replacement Cost (inflated to the year the asset should be replaced), and the Investment Required based on five-year increments relating to the year the asphalt reaches the end of its useful life cycle. Based on the table, the Township of Wilmot's road network has a current asset value of approximately 63.3 million dollars. Roads paved prior from 1972 to 1988 (as indicated in Figure 2-7 above) have reached the end of their useful life, making their current asset value $0.00.

**Table 2-10: Financial Valuation for Wilmot's Road Network**

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| Pre 2011 | | $ 2,730,342.37 | $ 0.00 | $ 2,383,586.30 | $ 3,140,446.03 |
| 2011 | 2015 | $ 10,999,643.22 | $ 529,553.07 | $ 11,292,323.94 | $ 10,740,336.47 |
| 2016 | 2020 | $ 12,755,275.46 | $ 2,137,899.99 | $ 14,447,250.47 | $ 11,316,815.08 |
| 2021 | 2025 | $ 16,926,388.31 | $ 6,918,734.38 | $ 22,908,940.08 | $ 12,629,756.98 |
| 2026 | 2030 | $ 25,373,296.83 | $ 16,037,242.85 | $ 40,506,249.51 | $ 16,130,411.36 |
| 2031 | 2035 | $ 39,321,235.37 | $ 30,994,196.37 | $ 70,466,365.01 | $ 21,970,259.35 |
| 2036 | 2040 | $ 6,993,170.96 | $ 6,702,040.03 | $ 14,201,184.73 | $ 3,499,249.38 |
| Total | | $ 115,099,352.52 | $ 63,319,666.69 | $ 176,205,900.05 | $ 79,427,274.65 |

### 2.2.5 Bridges

The following section describes the methodology employed to determine bridge costing.

#### 2.2.5.1 Assumptions

Some general assumptions applied to determine bridge costing are listed below:

- Initial price for bridge construction, as outlined on the 2011 and 2013 OSIM Inspection Forms, is correct
- Price does not include engineering fees
- Price is based on current practices, technology and materials for replacement of similar bridge

#### 2.2.5.2 Costs

**Table 2-10** shows the Current Replacement Cost, the Current Asset Value (or the depreciated value), the Future Replacement Cost (inflated to the year the asset should be replaced), and the Investment Required based on five-year increments relating to the year the bridge reaches the end of its useful life cycle. The cost of Wilmot's bridges is based upon the initial bridge cost. Based on the table, the Township of Wilmot's bridges have a current asset value of approximately 12.4 million dollars. Bridges built prior to 1953 have reached the end of their useful life, making their current asset value $0.00.

**Table 2-11: Financial Valuation for Wilmot's Bridges**

| Start Year | End Year | Current Replacement Cost | Current Asset Value (Depreciated Value) | Future Replacement Cost | Investment Required |
|---|---|---|---|---|---|
| Pre 2011 | | $ 7,368,000.00 | $ 0.00 | $ 7,368,000.00 | $ 7,368,000.00 |
| 2011 | 2015 | $ 3,025,500.00 | $ 5,425.00 | $ 3,035,265.00 | $ 3,016,287.74 |
| 2016 | 2020 | $ 530,000.00 | $ 48,583.33 | $ 623,769.73 | $ 452,721.69 |
| 2021 | 2025 | $ 4,044,250.00 | $ 686,408.33 | $ 5,466,771.05 | $ 3,020,071.84 |
| 2026 | 2030 | $ 6,704,500.00 | $ 1,661,850.00 | $ 10,407,463.83 | $ 4,375,083.73 |
| 2031 | 2035 | $ - | $ - | $ - | $ - |
| 2036 | 2040 | $ - | $ - | $ - | $ - |
| 2041 | 2045 | $ 530,000.00 | $ 226,133.33 | $ 1,364,793.86 | $ 211,484.90 |
| 2046 | 2050 | $ 4,500,000.00 | $ 2,140,000.00 | $ 12,923,115.45 | $ 1,617,250.58 |
| 2051 | 2055 | $ 6,832,500.00 | $ 3,667,533.33 | $ 22,490,636.96 | $ 2,153,786.71 |
| 2056 | 2060 | $ 453,000.00 | $ 277,840.00 | $ 1,764,454.80 | $ 120,931.86 |
| 2061 | 2065 | $ 1,371,000.00 | $ 923,893.33 | $ 6,109,384.69 | $ 321,364.08 |
| 2066 | 2070 | $ - | $ - | $ - | $ - |
| 2071 | 2075 | $ 2,600,000.00 | $ 2,149,333.33 | $ 16,251,044.51 | $ 438,447.54 |
| 2076 | 2080 | $ - | $ - | $ - | $ - |
| 2081 | 2085 | $ 575,000.00 | $ 539,733.33 | $ 4,607,380.57 | $ 76,193.59 |
| 2086 | 2090 | $ 92,500.00 | $ 90,033.33 | $ 800,311.65 | $ 11,374.46 |
| Total | | $ 38,626,250.00 | $ 12,416,766.67 | $ 93,212,392.09 | $ 23,182,998.72 |

*Note: No bridges will reach the end of their useful life between 2031 & 2040, 2066 & 2070, and 2076 & 2080 - cells are left blank intentionally.

## 2.3 ASSET CONDITION AND INFRASTRUCTURE REPORT CARD

This section outlines the condition of the Township of Wilmot's current infrastructure, based on evaluations and analysis completed by Wilmot staff and AE personnel. **Table 2-12** below defines the asset condition ratings that are assigned to the assets in the following subsections. Condition of the asset inventory was consolidated into the Manifold GIS file and maps for each asset class were created and colour coded based on condition. These maps can be found in Appendix C.

**Table 2-12: Asset Condition Ratings**

| Weighted Average | Rating | Definition of Rating |
|---|---|---|
| >= 8.00 | Very Good | *Fit for the Future* - The infrastructure in the system or networks is generally in very good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention. |
| 7.00 to 7.99 | Good | *Adequate for Now* - The infrastructure in the system or network is in good condition; some elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies. |
| 6.00 to 6.99 | Fair | *Requires Attention* - The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies. |
| 5.00 to 5.99 | Poor | *At Risk* - The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. |
| < 5.00 | Very Poor | *Unfit for Sustained Service* - The infrastructure in the system or networks is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service. |

Note: Table adapted from the Canadian Infrastructure Report Card, Volume 1: Municipal Roads and Water

### 2.3.1 Water

The likelihood of failure is based on the age and expected life of the water pipe. **Figure 2-10** below shows the likelihood of failure of a pipe versus the pipe diameter. This figure shows that the greater the pipe diameter and the older the pipe, the greater the chance of failure and the greater the impact of a failed watermain. Wilmot does not have any watermains that are close to failure that also have a large diameter. This indicates that the Township of Wilmot should focus on ensuring that those pipes highlighted in the 'Medium' risk section are frequently monitored for signs of failure. A map showing these pipes can be found in Appendix C.

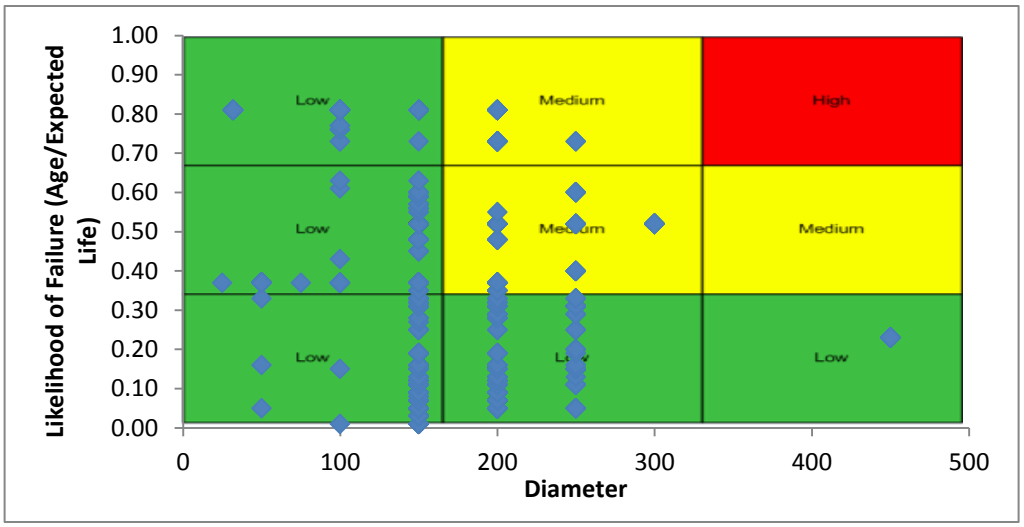



**Figure 2-10: Water Infrastructure Likelihood of Failure**

**Table 2-13** below shows the watermain condition rating based on the age of the pipe and the diameter of the pipe. The analysis is shown based on community and overall.

**Table 2-13: Water Condition Rating**

| | Year Condition | Diameter Condition | Overall Condition | |
|---|---|---|---|---|
| Baden | 7.49 | 5.26 | 6.38 | Fair |
| New Dundee | 6.89 | 6.41 | 6.65 | Fair |
| New Hamburg | 6.89 | 5.51 | 6.20 | Fair |
| St. Agatha | 8.61 | 6.02 | 7.32 | Good |
| **Overall** | **7.16** | **5.55** | **6.35** | **Fair** |

### 2.3.2 Wastewater

The likelihood of failure is based on the age and expected life of the wastewater pipe. **Figure 2-11** below shows the likelihood of failure of a pipe versus the pipe diameter. This figure shows that the greater the pipe diameter and the older the pipe, the greater the chance of failure and the greater the impact of a failed wastewater pipe. Wilmot does not have any wastewater collection pipes that are close to failure that also have a large diameter. This means that the Township of Wilmot should focus on ensuring that those pipes highlighted in the 'Medium' risk section are frequently monitored for signs of failure. These pipes are shown in the Wastewater Pipe Condition Figure in Appendix C.

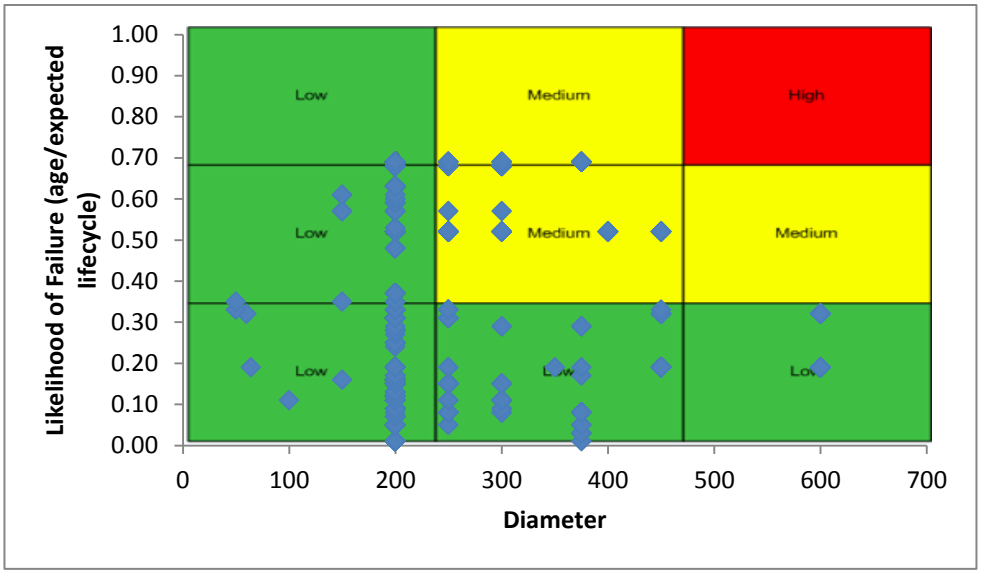



**Figure 2-11: Wastewater Infrastructure Likelihood of Failure**

**Table 2-14** below shows the wastewater infrastructure condition rating based on the age of the pipe and the diameter of the pipe. The analysis is shown based on community and overall. AE understands that Wilmot has recently undergone an extensive five year Inflow and Infiltration (I&I) program and has begun implementing rehabilitation recommendations from the study. However, for consistency purposes and availability of data, the condition rating is solely based on age and diameter. By implementing the recommended rehabilitation and completing a CCTV Inspection to support the recommended rehabilitation, the overall condition of the wastewater pipes will increase.

**Table 2-14: Wastewater Condition Assessment**

| | Year Condition | Diameter Condition | Overall Condition | |
|---|---|---|---|---|
| Baden | 7.49 | 5.53 | 6.51 | Fair |
| New Hamburg | 6.54 | 5.31 | 5.93 | Poor |
| **Overall** | **6.91** | **5.40** | **6.15** | **Fair** |

### 2.3.3 Stormwater

The likelihood of failure is based on the age and expected life of the water pipe. **Figure 2-12** below shows the likelihood of failure of a pipe versus the pipe diameter. This figure shows that the greater the pipe diameter and the older the pipe, the greater the chance of failure and the greater the impact of a failed stormwater pipe. Wilmot does not have any stormwater pipes that are close to failure that also have a large diameter. This means that the Township of Wilmot should focus on ensuring that those pipes highlighted in

the 'Medium' risk section are frequently monitored closely for any signs of failure. These pipes are shown in Appendix C.

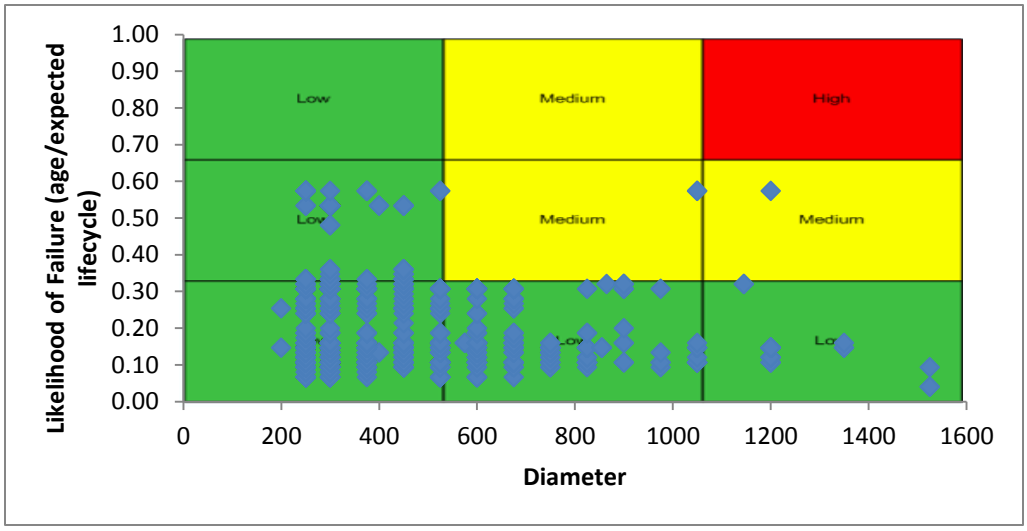



**Figure 2-12: Storm Infrastructure Likelihood of Failure**

**Table 2-15** below shows the stormwater infrastructure condition rating based on the age of the pipe and the diameter of the pipe. The analysis is shown based on community and overall.

**Table 2-15: Storm Condition Assessment**

| | Year Condition | Diameter Condition | Overall Condition | |
|---|---|---|---|---|
| Baden | 7.65 | 7.07 | 7.36 | Good |
| New Dundee | 6.62 | 7.11 | 6.87 | Fair |
| New Hamburg | 6.85 | 7.24 | 7.05 | Good |
| Petersburg | 6.40 | 7.20 | 6.80 | Fair |
| St. Agatha | 6.14 | 7.14 | 6.64 | Fair |
| **Overall** | **7.17** | **7.16** | **7.17** | **Good** |

### 2.3.4 Roads

Pavement Condition Index (PCI) is a numerical index between 0 and 100, which is used to indicate the general condition of a pavement. It is a statistical measure and requires manual survey of the pavement.

As part of the AMP assignment, AE staff surveyed all asphalt and tar & chip roads owned by Wilmot to define updated 2013 PCI figures for use in determining the state of the infrastructure for this study. PCI results are included in Appendix A.

**Figure 2-13** below shows the PCI versus Age. As would be expected, the PCI decreases with age.

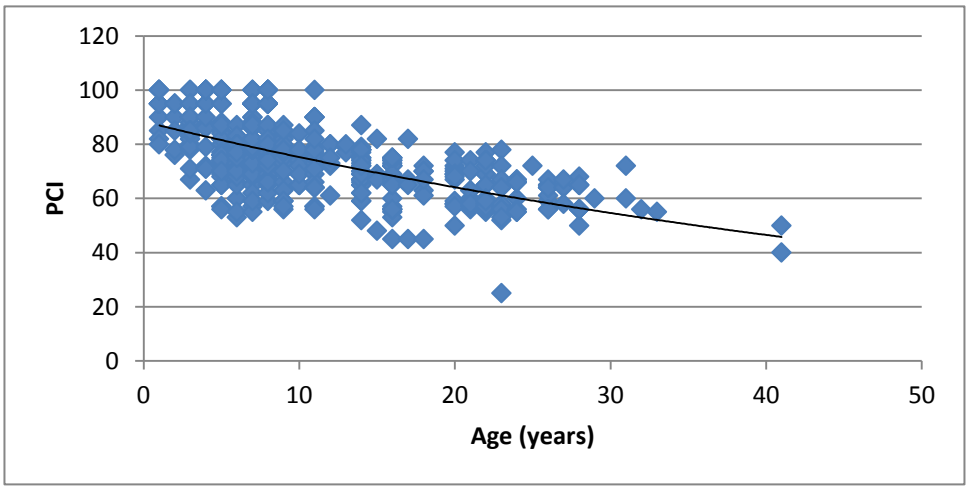



**Figure 2-13: PCI vs. Age**

Ride Comfort Rating (RCR) is a measurement of road smoothness. RCR figures for Wilmot roads were gathered by the Engineering Technician and AE staff. **Figure 2-14** below shows the RCR vs. the PCI. The results shown in this figure are expected as the higher the RCR is, the more important it will be, meaning it should be in better condition with a higher PCI.

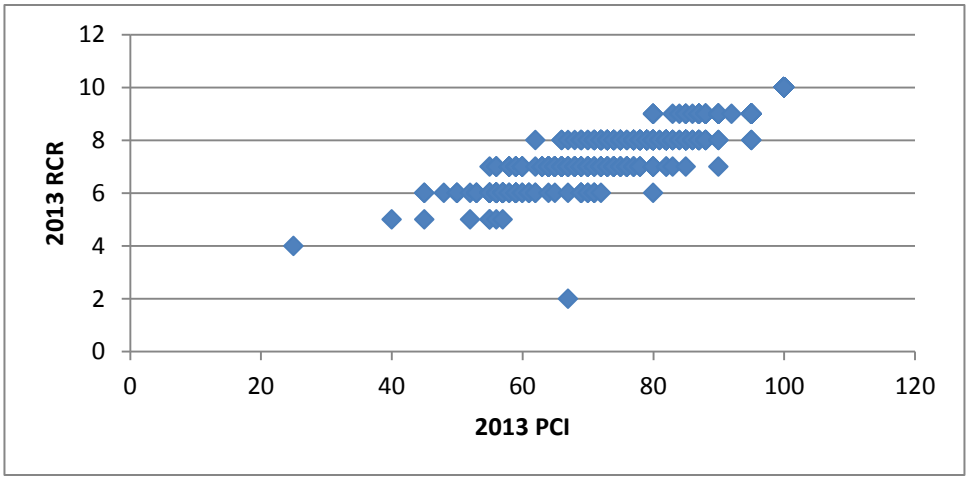



**Figure 2-14: RCR and PCI**

Under Ontario Regulation 239/02 “Minimum Maintenance Standards for Municipal Highways,” roads are segregated into maintenance classes based upon speed limits and Average Annual Daily Traffic (AADT). These maintenance classes determine patrolling frequencies, snow removal time frames, etc. **Figure 2-15** below shows the PCI vs. the Road Maintenance Class.

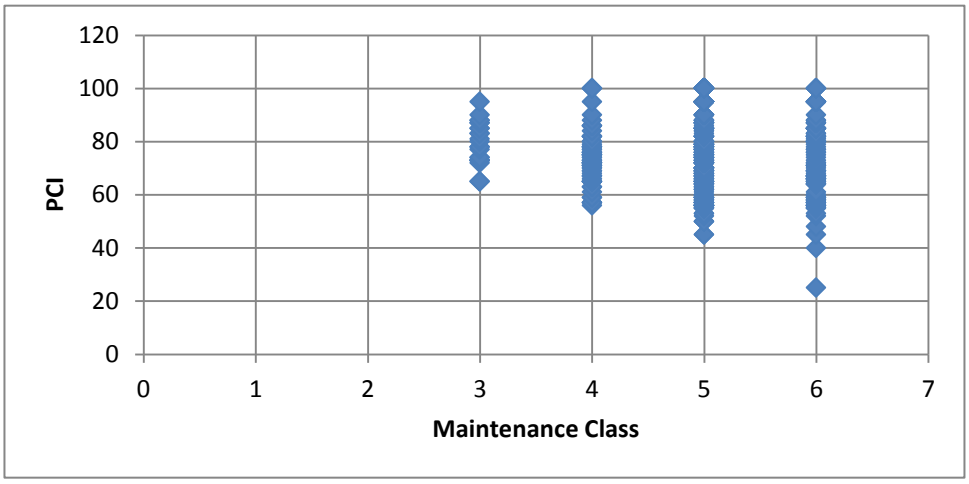



**Figure 2-15: PCI vs. Maintenance Class**

**Figure 2-16** below shows the RCR vs. Road Maintenance Class.

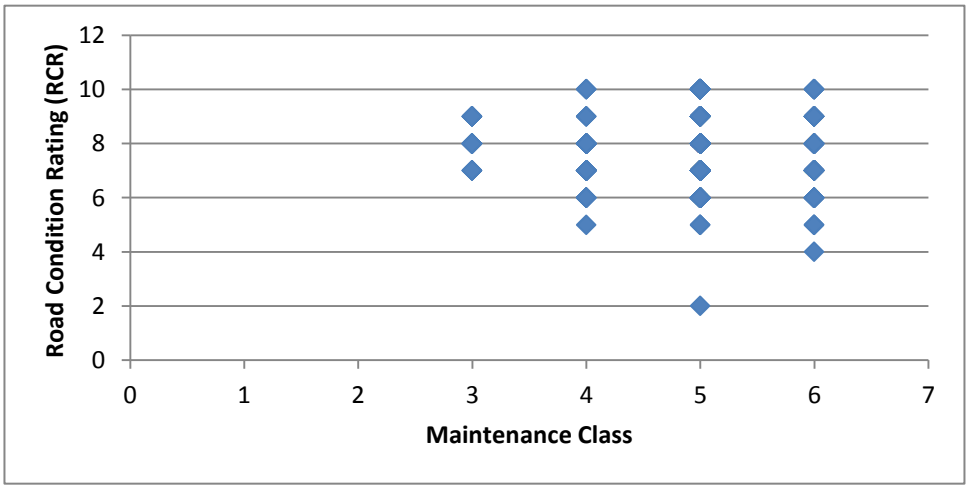



**Figure 2-16: RCR vs. Maintenance Class**

**Table 2-16** below shows the road condition assessments for each community, which is based primarily on the 2013 PCI ratings.

**Table 2-16: Road Condition Assessment**

| | Average PCI | Average RCR | Overall Condition | |
|---|---|---|---|---|
| Baden | 79.30 | 7.79 | 7.93 | Good |
| Mannheim | 73.34 | 7.42 | 7.33 | Good |
| New Dundee | 69.62 | 7.37 | 6.96 | Fair |
| New Hamburg | 74.62 | 7.64 | 7.46 | Good |
| Petersburg | 70.18 | 7.36 | 7.02 | Good |
| St. Agatha | 67.70 | 6.90 | 6.77 | Fair |
| **Overall** | **73.92** | **7.49** | **7.39** | **Good** |

### 2.3.5 Bridges

**Figure 2-17** below shows the Bridge Condition Index (BCI) vs. the remaining life of the bridge. The general trend shown is what would be expected in that, as the bridge ages, the BCI decreases. Some bridges that have reached the end of their useful life, or are close to the end of their useful life, have undergone rehabilitation to extend their useful life.

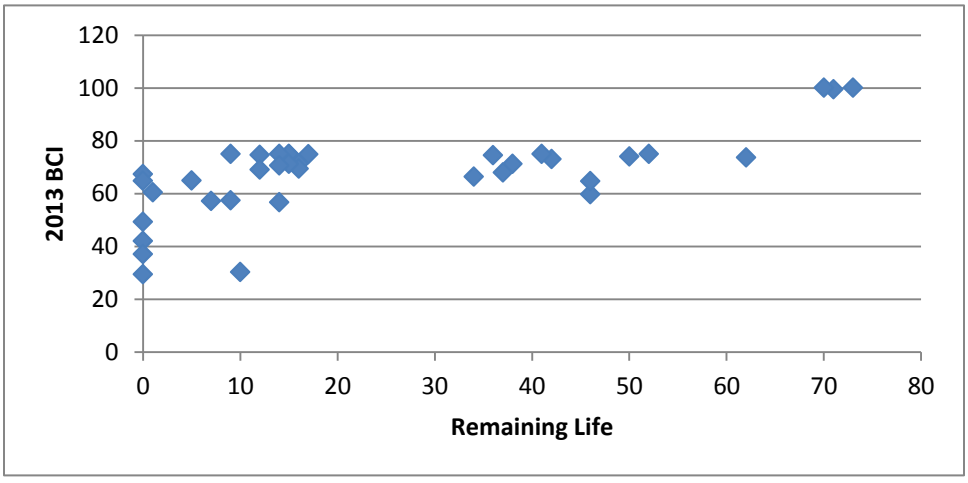



**Figure 2-17: BCI vs. Remaining Life**

**Table 2-17** shows the overall condition of the bridges, which is based on the average AADT and the 2013 BCI ratings.

**Table 2-17: Bridge Condition Assessment**

| | Average AADT | Average BCI | Overall Condition | |
|---|---|---|---|---|
| Overall | 7.42 | 6.73 | 7.08 | Good |

## 2.4 OVERALL INFRASTRUCTURE REPORT CARD

In summary, the infrastructure report card for the Township of Wilmot's assets is as follows:

| Asset | Rating | Grade |
|---|---|---|
| Water Infrastructure | 6.35 | Fair |
| Wastewater Infrastructure | 6.15 | Fair |
| Storm Infrastructure | 7.17 | Good |
| Road Infrastructure | 7.39 | Good |
| Bridge Infrastructure | 7.08 | Good |

# 3 Desired Levels of Service

AE performed a Level of Service workshop for key Township Staff on June 3, 2013. The workshop focussed on presenting key project results to date, level of service examples, and moving forward with levels of service that best fit with the Township's asset management approach. Following the workshop, the Township had internal discussion to narrow down the their approach to levels of service and the Key Performance Indicators (KPIs) they feel it is best to focus on going forward. A copy of the presentation can be found in Appendix D.

The following table represents both the KPIs selected by the Township of Wilmot and ones suggested by AE (indicated with an asterisk) based on best practices and engineering experience in other areas. KPIs 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 3-1: Key Performance Indicators for the Township of Wilmot**

| Asset Class | KPI | Measured By | Comments |
|---|---|---|---|
| Roads | Condition | Pavement Condition Index (PCI) | |
| | Cost | Annual operating costs for hard surface roads | |
| | Impact of Failure | Annual Average Daily Traffic (AADT) | |
| Bridges | Condition | Bridge Condition Index (BCI) based on OSIM inspection | |
| | Cost | Bi-Annual Appraisal Reports | |
| | Impact of Failure | AADT based on OSIM inspection*<br>Detour route based on OSIM inspection* | |
| Storm Sewer | Performance | No. of *flooding on road* incidents per annum | |
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on upstream sections, general indication of number served |
| | Condition | CCTV/PACP condition rating or Age & Material* | Inspection frequency based on previous condition rating or Age & Material |
| Watermains | Performance | No. of breaks per annum;<br>No. of water quality incidents;<br>Fire Flow / Available Pressure* | |

| Asset Class | KPI | Measured By | Comments |
|---|---|---|---|
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on downstream sections, general indication of number served |
| | Condition | Age & Material* | |
| Sanitary Sewers | Performance | No. blockages per annum. | |
| | Impact of Failure | Diameter* | Larger diameters have a greater effect on upstream sections, general indication of number served |
| | Condition | CCTV/PACP condition rating or Age & Material* | Inspection frequency based on previous condition rating or age & material |

* KPI's suggested by AE

## 3.1 DATA COLLECTION

To appropriately record, track, and monitor KPIs, it is recommended that the Township 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. This will allow for a link to the asset geometry stored in the GIS for viewing the information through a map interface. A long-term recommendation would be to consolidate all asset and KPI information in a centralized Asset Registry database.

### 3.1.1 Water

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. Water model
5. Pipe characteristics (diameter, material, installation year)
6. Time taken to respond to the incident
7. Time taken to return watermain back to service

### 3.1.2 Wastewater

1. Date of blockage
2. Location of blockage
3. Cause of blockage
4. Pipe characteristics (diameter, material, installation year)
5. Time taken to respond to the incident
6. Time taken to return sewer back to service
7. CCTV/PACP condition rating

### 3.1.3 Storm

1. Date of *flooding on road* incident
2. Location of flood (road and location on road)
3. Rainfall depth for discrete events
4. Time taken to respond to the incident
5. Time taken to return road back to service
6. Pipe diameter
7. CCTV/PACP condition rating
8. Installation date
9. Material

### 3.1.4 Roads

1. Road name inclusive of from/to
2. Physical road characteristics (material, installation year)
3. Provincial road classification
4. Maintenance performed on the road, inclusive of year, and the year most recently resurfaced
5. Pavement Condition survey resulting in a PCI
6. AADT reporting
7. Annual operating costs for hard surface roads

### 3.1.5 Bridges

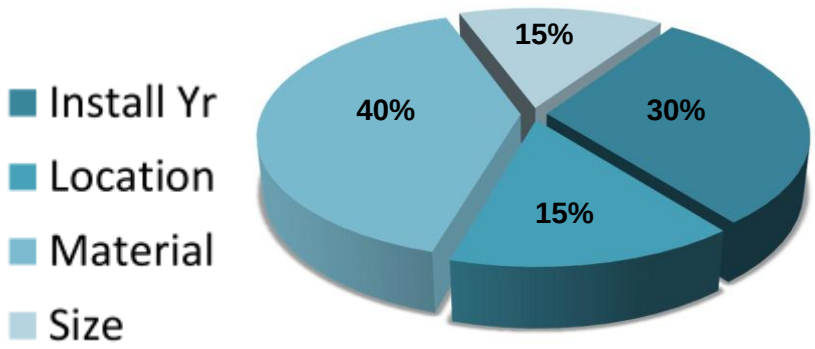
1. Bridge name and provincial bridge file number
2. Bridge location
3. Bridge characteristics (material, installation year)
4. Maintenance conducted on bridge
5. Bridge Condition Index as per OSIM inspection
6. AADT report as per OSIM inspection
7. Detour route based on OSIM inspection
8. Bi-Annual Appraisal Reports

### 3.1.6 Sample Weighted Matrix

This information should be recorded in a database and reviewed annually to determine appropriateness and applicability as time and maintenance programs are carried out. It is suggested that the Township consider the use of a weighted matrix, **Table 3-1** below, to assist with the determination of maintenance programs. A weighted matrix prioritizes the KPI based on the Township's standard of care. In the example provided below, the material of the pipe is the highest ranked indicator for when a wastewater pipe needs to be replaced. The figure below the table shows the weighting of each category, indicating the condition of a wastewater pipe, which allows the Township to determine which pipes need to be replaced when. Appropriate weightings should be determined by the Township based on their applied level of service.

**Table 3-2: Sample Weighted Matrix for Wastewater**

| Criteria | Detail | Range Values | Range Ratings | Units | Weighting |
|---|---|---|---|---|---|
| Install Year | Lifespan remaining | 1961 – 2012 | 0 – 10 | Years | 30% |
| Location | Impact of failure & type of area affected | | 0 – 10 | n/a | 15% |
| Material | Material descriptor | AC, CONC, DI, PVC, VIT | 0 – 10 | n/a | 40% |
| Size | Impact of failure & number served or affected | 100 – 600 | 0 – 10 | Millimetres | 15% |




*The above is sample provided for illustration purposes.

### 3.1.7 Cross-Asset Correlation & Spatial Indexing

In addition to the weighted matrix approach within an Asset Class such as Wastewater (outlined in the preceding section), the Township should consider an Asset Management software system in the future that will allow for comparison and prioritization of infrastructure assets across asset classes. These systems apply criteria to normalize priority and condition ratings across various asset classes to allow for direct comparison and for different scenarios to be considered as part of the short- and long-term capital planning. A further benefit of these systems allows for spatial analysis using proximity and location to consider assets for inclusion in each infrastructure project contained in the capital plan. This is often referred to as a "Right-of-Way" approach where all the infrastructure within a defined section of the corridor is compared with a view to avoiding multiple capital works on a given section of right-of-way within a short time period.

# 4 Asset Management Strategy

## 4.1 NON-INFRASTRUCTURE SOLUTIONS

Non-infrastructure solutions are actions or policies that can lower costs or extend asset life. Master Plans are an appropriate method to address this element. Wilmot has recently endorsed a Fire Master Plan and a Trails Master Plan. It is recommended that a detailed Infrastructure Master Plan could also be completed by the Township.

An Infrastructure Master Plan is a reference document to assist the Township staff in implementing a long-term servicing plan for key pieces of infrastructure, which can include wastewater, stormwater, and water as well as roads/transportation. In some cases separate master plans are completed or lumped into one study. The study must address the impacts of growth and ensure that servicing, generally one of the largest cost components related to growth, is part of the decision making about where the Township should grow. This kind of document has direct impact on budgets, DC charges, level of service, and overall environmental well-being of the community. It is generally completed in accordance with the Municipal Class Environmental Assessment process.

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

An Infrastructure Master Plan is different from the Township's 10-Year Capital Budget Forecast. The Infrastructure Master Plan is a planning document that looks at infrastructure over a longer period of time, typically 25 years.

In addition to infrastructure assets, the Township has various other assets such as facilities, fleet, equipment, and technology. These currently require reporting for financial purposes and could be included in future Asset Management initiatives and financial planning as outlined in Section 5. These non-infrastructure assets typically account for approximately 30% of municipality's total assets.

## 4.2 MAINTENANCE ACTIVITIES

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

It is recommended that the Township consolidate all asset information for bridges, roads, and underground infrastructure in a database. This asset information should include criteria such as installation date, material, dimensions, etc., which can be accessed using a GIS-based program. The GIS program will allow the information to be easily accessible and visual. It is important that this information be updated on an annual or semi-annual basis to ensure the database is current. AE will provide a base asset inventory database as a deliverable to this project. There are non-infrastructure assets that are not included in this

inventory that AE recommends collecting. These include the Level of Service indicators and Key Performance Indicators, outlined in Section 3.

### 4.2.1 Bridge Maintenance Activities

Bridge OSIM Inspections need to occur every two years as per regulations and the Township has been in compliance with this regulation. It is recommended that the Township continue to follow the recommendations provided on the OSIM Reports in terms of bridge rehabilitation and replacement.

### 4.2.2 Road Maintenance Activities

Although Township staff currently collect some road data, it is recommended that the Township implement a formalized Road Inspection Program that involves the collection of PCI and AADT data to complement existing information. Both PCI and AADT have been identified as Key Performance Indicators through the Level of Service Workshop, as outlined in Section 3 of this report. This program could be implemented by Township staff or portions of the program could be outsourced to a "Subject Matter Expert" if current staffing is at capacity.

If the program can be implemented by Township staff, it is recommended that the Township implement a three-year PCI inspection program where one-third (1/3) of the municipality is inspected every year. Roads that should be inspected every year include those reaching the end of their useful life, roads with high AADT values, and roads of high criticality and importance. An AADT program is already in place where 105 locations are surveyed each year. If feasible, this program could be expanded to include most roads within the Township and extended over a three to five-year period. GIS tools and analysis can be utilized with determining priority roads for AADT data collection. If current staffing is at capacity, the collection of PCI and AADT data can be outsourced once every three to five years.

Roads having a PCI of 70 or greater only require preventative maintenance such as crack sealing and patching. Roads having a PCI of 40 to 70 require rehabilitation to extend their useful life, and roads with PCIs less than 40 should be considered for replacement.

PCI's have been determined for all asphalt and tar & chip roads as a deliverable with this report, provided in Appendix A. GIS analysis provides a good option for determining which streets the PCI and AADT need to be collected for and the appropriate year of collection.

### 4.2.3 Underground Infrastructure Maintenance Activities

It is recommended that the Township strongly consider a CCTV Inspection Program for their both their wastewater and stormwater pipes. AE would recommend maintaining focus on the wastewater pipes first. Areas of high risk, such as large diameter pipes, pipes in the last quarter of their lifecycle, and areas where breaks occur, should be monitored on an annual basis. Although it is important other pipes are monitored, they do not need to be monitored on an annual basis. A condition-based program is recommended for the Township of Wilmot. Below is an outline of suggested program requirements:

- All pipes should be surveyed within the first 5 years for a baseline
- This should be done by a reputable contractor certified in current inspection standards (Pipeline Assessment and Certification Program [PACP])
- Pipes should be given an overall structural index rating for pipe condition (1-5)
    - 5: Immediate attention needed
    - 4: Poor; will become Grade 5 in near future
    - 3: Fair; moderate
    - 2: Good; has not begun to deteriorate
    - 1: Excellent; minor defects

- All pipes in excellent condition with rating of 1 should be inspected once every 10 years
- All pipes that are in good condition with a rating of 2 should be inspected every 5 years
- All pipes in fair condition with a rating of 3 should be inspected every 2 years
- All pipes in poor or immediate response condition with a Structural Inspection rating of 4 or greater should be inspected every year
- The cost of inspection is estimated at $1.50 per metre of pipe

The Township of Wilmot has recently completed extensive Inflow & Infiltration (I&I) works over the past five years. I&I programs are important to understand flows and potential locations for losses and other problems. However, an I&I program is different from a CCTV program. CCTV inspection programs provide video records of the complete sanitary and storm systems. AE recommends acquiring CCTV video to complement the video already acquired through the I&I program. The mapping of defect locations and the corresponding repair program are further supported by the CCTV data. A CCTV program usually includes a five year program to video 20% of the system each year and future video inspections are scheduled based on the condition of the capital inspection. Wilmot already uses CCTV when other capital works projects are completed, and the Township should continue doing this. For example, when the Township is replacing a watermain under a section of road, the CCTV inspection should be updated to validate the sewer condition to ensure it is not necessary to replace both the watermain and sanitary sewer at the same time.

## 4.3 RENEWAL/REHABILITATION ACTIVITIES

Renewal and rehabilitation activities are significant repairs designed to extend the life of an asset. The following are suggested for the Township of Wilmot:

### 4.3.1 Bridge Rehabilitation

The 2013 OSIM Inspection Forms provided the following rehabilitation activities, shown in **Table 4-1**. The final column of the table shows which bridges have been scheduled for rehabilitation within the 10-Year Capital Budget Forecast.

**Table 4-1: Recommended Bridge Rehabilitation Activities**

| Timing | Structure ID | Rehabilitation Description | Rehabilitation Included in 10-Year Capital Budget |
|---|---|---|---|
| 1-5 Years | STR_10/B-T4 | • Install SBGR and New Approach Slabs<br>• Patch, waterproof and pave deck<br>• Resurface approaches with deck work | |
| 1-5 Years | STR_16/B-NH | • Replace seals<br>• Concrete patching<br>• Replace approach sidewalk conditions | |
| 1-5 Years | STR_31/B-T8 | • Patch, waterproof, and pave bridge deck<br>• Concrete patches in deck<br>• Repair concrete girders | Planned for 2015 |
| 1-5 Years | STR_4/B-T2 | • Replace barriers<br>• Concrete deck patches<br>• Patch, waterproof and pave bridge deck<br>• Concrete patch repairs on curbs | Planned for 2013 |
| 1-5 Years | STR_7/B-T3 | • Replace SBGR/ install approach slabs<br>• Patch, waterproof, and pave deck top<br>• Replace joints on concrete end dams<br>• Concrete patch repairs on wingwalls of abutments<br>• Repave approaches | Planned for 2016/2017 |
| 1-5 Years | STR_9/B-T4 | • Install SBGR/ install approach slabs<br>• Repave approaches<br>• Patch spalled and delaminated beams<br>• Patch, waterproof, and pave deck top<br>• Replace joints | |
| 6-10 Years | STR_20/B-T11 | • Re-pave approaches<br>• Patch, waterproof, and pave deck top | |
| 6-10 Years | STR_33/B-T9 | • Replace barrier<br>• Repair concrete in the deck soffit – thin slab<br>• Patch, waterproof and pave deck top. Clean accumulated sand as maintenance.<br>• Pave roadway approaches<br>• Repair concrete in the abutment walls<br>• Reconstruct deck rains | |
| 6-10 Years | STR_35/B-OXF | • Re-pave approaches<br>• Patch, waterproof, and pave deck top<br>• Seal longitudinal construction joint and repair concrete<br>• Concrete patch repairs on curbs | Planned for 2013/2014. |

| Timing | Structure ID | Rehabilitation Description | Rehabilitation Included in 10-Year Capital Budget |
|---|---|---|---|
| 6-10 Years | STR_36/B-OXF | • Repair concrete curbs<br>• Repair fascia<br>• Patch, waterproof and pave deck top<br>• Clean accumulated debris as maintenance<br>• Repair concrete on barrier/parapet walls<br>• Repair concrete on wingwalls<br>• Repair concrete on abutment walls<br>• Seal longitudinal construction joint on soffit – thin slab | Planned for 2015/2016 |
| 6-10 Years | STR_38/B-OXF | • Repair ends of barrier wall | |
| 6-10 Years | STR_6/B-T3 | • Repair concrete on barrels | |

### 4.3.2 Road Rehabilitation

From the Road Inspection Program, roads with a PCI of 40 to 70 require rehabilitation. Based on the 2013 PCI Inspection, approximately 36% or 197 road segments have PCIs between 40 and 70. These areas should be considered for rehabilitation to extend their overall lifecycle.

Although the Township has recognized some of these areas for rehabilitation, of the 197 road segments with PCIs between 40 and 70, 39 road segments have been identified for the hot mix paving program and surface treatment program outlined in the 10-Year Capital Budget Forecast. The Township has also identified 16 gravel roads that will be part of the surface treatment program for single surface or triple surface. By paving these road segments, the useful life of the road will be extended.

**Table 4-3**, located below in Section 4.4.2, shows the roads that have a PCI between 40 and 55 and indicates which of these roads are planned for rehabilitation in the 10-Year Capital Budget Forecast.

### 4.3.3 Underground Infrastructure Rehabilitation

The CCTV Program recommended in Maintenance Activities that it is important for determining where sanitary spot repairs should occur in order to extend the life cycle of the pipe. It is difficult to recommend replacement when a thorough field investigation of the pipes has not been conducted.

The Township of Wilmot has recently completed extensive Inflow & Infiltration (I&I) works over the past five years. I&I programs are important to understand flows and potential locations for losses and other programs. The I&I report provided Wilmot a ranking of repair priority for a selection of problematic wastewater pipes and manholes in these two settlement areas. This tool allows Wilmot to determine which pipes need to be repaired and which need to have rehabilitation work completed to lengthen the useful life of the pipe. It is recommended that Wilmot use this tool and continue CCTV investigations on their sanitary

pipes to make smart decisions to extend the life of their current underground infrastructure. The CCTV data will allow the defect locations to be mapped and combined with the Inflow and Infiltration recommendations to support the corresponding repair program.

## 4.4 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 Township of Wilmot.

### 4.4.1 Bridge Replacement Activities

The 2013 OSIM Inspection Forms provided the following bridge replacement activities shown in **Table 4-2**. The final column of the table shows which replacement activities have been scheduled in the 2013 10-Year Capital Budget Forecast.

**Table 4-2: Recommended Bridge Replacement Activities**

| Timing | Structure ID | 2013 OSIM Estimated Cost | Replacement Included in the 10-Year Capital Budget |
|---|---|---|---|
| 1 – 5 Years | STR_34/B-T9 | $ 2,650,000.00 | Rehabilitation planned for 2015. Replacement planned in 2021/2022 |
| | STR_37/B-OXF | $ 2,650,000.00 | |
| | STR_40/C-T12 | $ 162,500.00 | Replacement planned in 2014 |
| 6 – 10 Years | STR_14/B-ESH | $ 264,500.00 | |
| | STR_24/B-T12 | $ 340,000.00 | |
| | STR_28/C-T13 | $ 231,000.00 | Replacement planned in 2018/2019 |
| | STR_42/B-ESH | $ 285,000.00 | |

Although STR_34/B-T9 was built in 1913, it should be noted that this bridge has undergone three rehabilitation programs to extend its useful life. In 1982, Wilmot completed rehabilitation on the substructure and deck replacements. In 2005, structural repair of the floor beam ends was carried out. In 2011, structural repair was performed on the remaining floor beam ends, exterior stringers and ends of the bottom chords.

### 4.4.2 Road Replacement Activities

From the Road Inspection Program, roads with a PCI of 0 to 40 require reconstruction. Based on the 2013 PCI Inspection, Albert Street in New Hamburg is the only road that has a PCI below 40. However, money should continue to be allocated based on prioritization.

The 2013 PCI investigation indicated that five road segments have a PCI between 40 and 49, 17 road segments with PCI between 50 and 55, and 64 road segments with a PCI between 56 and 59. These roads should be monitored and although they do not need to be replaced immediately, they should be replaced once they have reached the end of their useful life and have PCI's below 40. **Table 4-3** below indicates the roads with PCI between 40 and 55 and the road segments that Wilmot plans to replace based on their 10-Year Capital Budget Forecast.

**Table 4-3: Road Segments with PCI between 40 and 55**

| Road Name | To Street | From Street | Age (as of 2013) | 2013 PCI | Settlement Area | Replacement Included in the 10-Year Capital Budget |
|---|---|---|---|---|---|---|
| Nelson St | End | Waterloo St | 16 | 40 | New Hamburg | |
| Hamilton Rd | Neville St | End | 17 | 45 | New Hamburg | |
| Mill St | Charlotta St | Snyder's Rd W | 16 | 45 | Baden | |
| Mill St | Jacob Street | End | 18 | 45 | New Hamburg | |
| Kurt Pl | End (Bulb) | End (Bulb) | 15 | 48 | New Dundee | |
| Grant St | Conestoga Rd | William St | 41 | 50 | New Hamburg | 2013, 2015 |
| Main St | Alderside Dr | Mill Street | 28 | 50 | New Dundee | |
| William St | Grant St | Waterloo St | 20 | 50 | New Hamburg | 2013, 2015 |
| Deerfield Ave | End | Alice Cres | 14 | 52 | Petersburg | |
| Miller St | Charlotta St | Snyder's Rd W | 23 | 52 | Baden | |
| Bergey Crt | Morningside Cir | Parkway Dr | 23 | 53 | New Hamburg | Rehab 2021 |
| Bleams Rd W | Fairview St | Wilmot St | 16 | 53 | New Hamburg | |
| Bleams Rd W | End | Fairview St | 6 | 53 | New Hamburg | |
| Bergey Crt | End (Bulb) | End (Bulb) | 23 | 55 | New Hamburg | Rehab 2021 |
| Bergey Crt | Parkway Dr | Shephard Pl | 7 | 55 | New Hamburg | Rehab 2021 |
| Brubacher St | End | Old School House Rd | 6 | 55 | Baden | |
| Nithview Crt | End (Bulb) | End (Bulb) | 22 | 55 | New Hamburg | |
| Queen St | Charlotta St | Snyder's Rd W | 23 | 55 | Baden | |
| Stone St | End | Huron St | 33 | 55 | New Hamburg | 2019, 2021 |
| Victoria St | Waterloo St | Park Pl | 16 | 55 | New Hamburg | |
| Webster St | King St | Waterloo St | 24 | 55 | New Hamburg | 2022 |
| Webster St | Victoria St | King St | 24 | 55 | New Hamburg | 2022 |

### 4.4.3 Underground Infrastructure Replacement Activities

#### 4.4.3.1 Watermains

During a review of recent watermain activity records, it was noted that the majority of watermain breaks occurring between 2009 and 2013 were on cast iron and ductile iron pipes. It is recommended that the Township continue their practice of replacing their cast iron pipes with PVC pipes after a break has occurred or near the end of their life cycle to reduce the risk of failure. The road segments containing cast iron or ductile iron pipes are shown below in **Table 4-4**. The final column of the table indicates if the watermain is included in the 10-Year Capital Budget Forecast for replacement.

In many cases, it is in the Township's best interest to continue coordinating pipe replacement with road reconstruction. It is neither cost effective nor good infrastructure planning to look at one asset class in isolation from the others when developing the capital program, so underground replacement works should be tied to road replacement works.

**Table 4-4: Cast and Ductile Iron Pipes in the Township of Wilmot**

| Settlement Area | Street | From Street | To Street | Replacement Included in the 10-Year Capital Budget |
|---|---|---|---|---|
| New Hamburg | Astor Crescent | Conestoga Road | Forest Avenue | |
| New Hamburg | Bergey Court | Morningstar Circle | Bleams Road East | |
| New Hamburg | Bleams Court | Huron Street | End | |
| New Hamburg | Bleams Road East | Morningside Circle | Highway 7/8 | |
| New Hamburg | Boullee Street | Peel Street | Jacob Street | |
| New Hamburg | Catharine Street | Steinman Street | Walter Perry Place | |
| New Hamburg | Conestoga Road | James Street | Forrest Ave East | |
| New Hamburg | George Street | King Street | Victoria Street | |
| New Hamburg | Grandview Avenue | Hunter Street | Bleams Court | |
| New Hamburg | Grant Street | Williams Street | Conestoga Road | |
| New Hamburg | Grace Street | Asmus Street | End | |
| New Hamburg | Hannah Street | Waterloo Street | Milton Street | Planned 2017, 2019 |
| New Hamburg | Heritage Drive | Bleams Road East | End | |
| New Hamburg | Hincks Street | Forrest Avenue W | Steinman Street | |
| New Hamburg | Huron Street | Stone Street | west Xm | |
| New Hamburg | Huron Street | Union Street | Wilmot Street | |
| New Hamburg | King Street | George Street | Webster Street | Planned 2015, 2017 |

| Settlement Area | Street | From Street | To Street | Replacement Included in the 10-Year Capital Budget |
|---|---|---|---|---|
| New Hamburg | Milton Street | Shade Street | Hannah Street | Planned 2016,2018 |
| New Hamburg | Nithview Court | Hamilton Road | Nithview Drive | |
| New Hamburg | Nithview Drive | Hamilton Road | End | |
| New Hamburg | Park Place | Victoria Street | End | |
| New Hamburg | Peel Street | Boullee Street | Bleams Road West | |
| New Hamburg | Seyler Street | Peel Street | Jacob Street | |
| New Hamburg | Shade Street | Waterloo Street | Perth Street | |
| New Hamburg | Steinman Street | Waterloo | Catharine Street | |
| New Hamburg | Victoria Street | Arnold Street | Webster Street | |
| New Hamburg | Webster Street | Waterloo Street | Victoria Street | Planned 2022 |
| New Hamburg | Williams Street | Grant Street | Waterloo Street | Planned 2013, 2015 |
| New Hamburg | Wilmot Street | Church Street | Bleams Road | Planned 2018, 2020 |
| New Dundee | Alderview Drive | Main Street | End | |
| New Dundee | Bock Court | Bock Drive | End | |
| New Dundee | Bock Drive | Main Street | Alderview Drive | |
| New Dundee | Casselholm Cres | Queen Street | Queen Street | |
| New Dundee | Main Street | Alderview Drive | Bock Drive | |
| New Dundee | Queen Street | South Street | Bridge Street | |

#### 4.4.3.2 Wastewater

At the time of this AMP, no sanitary pipes owned by the Township have reached the end of their useful life and need replacing as the useful life of a sanitary main is 75 years and the oldest sanitary main is 52 years old, installed in 1961. There are 74 segments of pipe installed during 1961, constructed from a variety of materials; once these pipe segments near the end of their useful life, CCTV investigations should be completed to determine if the pipes should be replaced or rehabilitated.

#### 4.4.3.3 Stormwater

Similar to wastewater, no stormwater pipes owned by the Township have reached the end of their useful life. The useful life of a stormwater pipe is 75 years, and the oldest stormwater pipe is only 43 years old, installed in 1970. There are 20 pipe segments that were installed in 1970, and once these segments near the end of their useful life, CCTV investigations should be conducted to determine if these pipes need to be replaced or can be rehabilitated to extend their useful life.

## 4.5 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. **Table 4-5** below shows the recommended disposal activities for the Township of Wilmot. The recommended bridge disposal activities are cited from the 2013 OSIM reports. It should be noted that the Township currently properly disposes of end-of-life infrastructure appropriately, and they should continue to do so into the future.

**Table 4-5: Recommended Disposal Activities**

| Category | Structure ID | Structure Location |
|---|---|---|
| Bridges (Based on 2013 OSIM inspection report) | STR_34/B-T9 | Bridge Street |
| | STR_37/B-OXF | Oxford Waterloo Road Townline |
| | STR_40/C-T12 | Haysville Road |
| | STR_14/B-ESH | Wilmot-Easthope Road Townline |
| | STR_24/B-T12 | Huron Road |
| | STR_28/C-T13 | Tye Road |
| | STR_42/B-ESH | Wilmot-Easthope Road |
| Roads | When roads reach the end of their useful life and need to be replaced, the asphalt, tar & chip, or gravel and stone need to be properly disposed of. | |
| Underground Infrastructure (Stormwater, Wastewater, Watermains) | No pipes have reached the end of their useful life. However, when they do and the pipes are replaced, the old pipes need to be properly disposed of. | |

## 4.6 EXPANSION ACTIVITIES

Expansion activities are planned activities required to extend services to previously non-serviced areas or expand services to meet growth demands.

According to the Township Strategic Plan, Wilmot's population is expected to grow to 28,500 residents by 2029. The Township is planning for growth in Baden and New Hamburg over the next ten years. This means that the water and wastewater networks must be able to accommodate this new capacity. Storm, water, and wastewater networks need to be built into the proposed areas of development.

It is recommended that the Township continue to update their water and sewer models and review or have a consultant either complete a hydraulic assessment or peer-review the Township's hydraulic assessment to ensure the systems have the capacity to support expansion. It is important that the Township have a copy of all modelling exercises that are completed for their system. The Township should specify the format for the digital deliverables for all future projects.

It is also recommended that the Township continue to utilize the Region of Waterloo's water and sewer models for those areas serviced by the Region.

AE understands that a consultant is currently completing a Sanitary Study for the new growth areas and models will be provided through this project. It is our recommendation that these models be received digitally as well as in hard copy. It is the Township's responsibility to ensure that these models are updated on a regular basis to stay current. This will reduce costs of future projects that utilize the model and will aid in the planning process for future growth areas.

A key growth area for the Township is the Wilmot Employment Lands, 56 hectares of land situated in the New Hamburg and Baden urban settlement areas. These lands are primarily industrial in nature and are all serviceable with additional land available if demand exceeds supply. The current 10-year capital forecast addresses immediate servicing needs for this area which consists primarily of watermain construction (Hamilton – Nafziger).

## 4.7 PROCUREMENT METHODS

The majority of the Township's underground infrastructure is relatively young and is not in a state that requires rehabilitation or replacement immediately. It is recommended that the Township examine several methods to developing their capital program going forward. This includes continuing to consider pooling of projects, joint projects with neighbouring municipalities and the Region, and joint projects with utility companies. These types of methods to project planning can assist the Township with streamlining their capital planning process and optimizing the allocation of funding going forward. In addition, GIS and spatial analysis using proximity and location should be leveraged to consider assets for inclusion in each infrastructure project. This is often referred to as a "Right-of-Way" approach where all infrastructure assets within a defined section of the corridor are compared with a view to avoiding multiple capital works on a given section of right-of-way within a short time period. It also may be beneficial to add or consider including infrastructure adjacent to a planned capital works project to benefit from efficiencies and reduce mobilization and de-mobilization costs.

## 4.8 RISKS

With the implementation of every plan come risks. There are some risks relating to this AMP, which include: limited budget, knowledge gaps, and staffing capacity issues.

With a limited budget comes issues surrounding financing tools that can be used to help make effective decisions relating to areas of rehabilitation and replacement. A limited budget can also create issues in maintaining an expected level of service for the community.

It is difficult to have a Staff complement that are "subject matter experts" in all areas of infrastructure planning and asset management. These knowledge gaps, although not uncommon for many municipalities, can create issues for effective decision making and collecting appropriate data to support levels of service and corresponding key performance indicators (KPIs). The most appropriate way to mitigate this risk is for

the Township to retain “subject matter experts” from outside the organization where appropriate. The “subject matter expert” could be retained to complete work or take on the role of key advisor or reviewer for certain projects. They focus on ensuring the deliverables provided to the Township meet the specifications of the Request for Proposal (RFP). For example, the Township could retain a “subject matter expert” to assist in writing a comprehensive CCTV program and to review bidders’ submissions, qualifications, and results to ensure the Township is getting consistency with their deliverables and digital deliverables in a format that minimizes staff effort to integrate and use them in the future. “Subject matter experts” are common for major programs such as CCTV where the Township does not want to commit resources or does not want the skill set as a resource. These experts are usually employed selectively based on staffing levels and the specific program being outsourced.

Staffing capacity is also a common risk among many municipalities and ties into the risk of knowledge gaps. Most government agencies have finite human and financial resources; current levels are not expected to change appreciably, resulting in the need to optimize staff allocation. Current staff may become overloaded, resulting in activities such as collecting KPIs becoming a lower priority than other more urgent concerns. Without KPIs, staff cannot effectively make decisions on the most appropriate areas for rehabilitation and replacement. For this plan to be effective, the risks outlined above should be reviewed, addressed, and mitigated through systematic planning of projects and staffing in order to meet capital planning needs.

# 5 Financing Strategy

The financial strategy is the final component of the Asset Management Plan and it provides the plan to move forward with the Asset Management Strategy that was provided previously in this report.

The Township of Wilmot provides funding for assets through three sources of revenue: Water User Fees, Wastewater User Fees, and the Municipal Tax Levy. The financial strategy supports this method of operating by addressing these three separate areas. Note that this financing strategy assumes zero change to the existing funding received through senior government programs, including the Federal Gas Tax and the Ontario Municipal Partnership Fund.

The Asset Management Plan addresses a portion of the Township of Wilmot's assets. This Financial Strategy assumes that 70% of the Township's assets are included in this AMP. The available financing has been reduced by 30% as the assets that are out of scope of this AMP will also need to be financed. This is a reasonable allocation to out-of-scope assets based on a review of other municipalities.

## 5.1 SHORT-TERM FINANCIAL STRATEGY – 2014 TO 2023

### 5.1.1 Water Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures for water infrastructure over the next 10 years are displayed in the following chart.

**Table 5-1: Water Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014 | $ 429,478 | $ 109,101 | $ 386,456 | $ 706,833 |
| 2015 | $ 706,833 | $ 85,830 | $ 398,050 | $ 1,019,052 |
| 2016 | $ 1,019,052 | $ 288,560 | $ 409,991 | $ 1,140,482 |
| 2017 | $ 1,140,482 | $ 622,663 | $ 422,291 | $ 940,111 |
| 2018 | $ 940,111 | $ 684,946 | $ 434,960 | $ 690,125 |
| 2019 | $ 690,125 | $ 491,987 | $ 448,008 | $ 646,146 |
| 2020 | $ 646,146 | $ 485,283 | $ 461,449 | $ 622,312 |
| 2021 | $ 622,312 | $ 431,619 | $ 475,292 | $ 665,985 |
| 2022 | $ 665,985 | $ 283,409 | $ 489,551 | $ 872,127 |

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2023 | $ 872,127 | $ 354,604 | $ 504,237 | $ 1,021,761 |
| Total | | $ 3,838,002 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at the end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.
- These values do not include engineering fees, estimate at 8–10% of project costs

This chart illustrates that over the course of the next 10 years the current Water Capital Levy is sufficient to finance the Asset Management Plan expenditures. At the end of 2023 there is a surplus of $1,021,761. This surplus will be used to finance expenditures in the 2024–2033 decade where a deficit would be incurred.

### 5.1.2 Wastewater Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures for wastewater infrastructure over the next 10 years are displayed in the following chart.

**Table 5-2: Wastewater Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014 | $ 580,893 | $ 0 | $ 305,704 | $ 886,597 |
| 2015 | $ 886,597 | $ 0 | $ 314,875 | $ 1,201,472 |
| 2016 | $ 1,201,472 | $ 0 | $ 324,321 | $ 1,525,793 |
| 2017 | $ 1,525,793 | $ 0 | $ 334,051 | $ 1,859,845 |
| 2018 | $ 1,859,845 | $ 0 | $ 344,073 | $ 2,203,917 |
| 2019 | $ 2,203,917 | $ 0 | $ 354,395 | $ 2,558,312 |
| 2020 | $ 2,558,312 | $ 0 | $ 365,027 | $ 2,923,338 |
| 2021 | $ 2,923,338 | $ 0 | $ 375,977 | $ 3,299,316 |
| 2022 | $ 3,299,316 | $ 0 | $ 387,257 | $ 3,686,572 |
| 2023 | $ 3,686,572 | $ 0 | $ 398,874 | $ 4,085,447 |

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| Total | | $ 0 | | |

There are zero Capital Expenditures over the next 10 years anticipated for wastewater infrastructure.

The Capital Expenditures over the 100 years of the Asset Management Plan indicate that the asset replacements are grouped in large amounts but they are separated into periodic years, such as:

2036 - $6,293,000
2037 - $4,958,000
2041 - $4,365,000
2044 - $1,069,000
2045 - $1,772,000
2049 - $14,475,000

The surplus from the early years will be needed to finance expenditures in the 2034–2043 decade where a deficit will be incurred.

### 5.1.3 Tax Supported Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures for roads, bridges, and storm infrastructure over the next 10 years are displayed in the following chart.

**Table 5-3: Roads, Bridges, and Storm Infrastructure Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014 | $ 783,274 | $ 12,683,062 | $ 1,731,612 | $ -10,168,175 |
| 2015 | $ -10,168,175 | $ 5,137,650 | $ 1,783,561 | $ -13,522,265 |
| 2016 | $ -13,522,265 | $ 4,619,903 | $ 1,837,067 | $ -16,305,101 |
| 2017 | $ -16,305,101 | $ 2,667,234 | $ 1,892,180 | $ -17,080,156 |
| 2018 | $ -17,080,156 | $ 3,372,429 | $ 1,948,945 | $ -18,503,639 |
| 2019 | $ -18,503,639 | 0 | $ 2,007,413 | $ -16,496,226 |
| 2020 | $ -16,496,226 | $ 1,281,019 | $ 2,067,636 | $ -15,709,609 |
| 2021 | $ -15,709,609 | $ 854,170 | $ 2,129,665 | $ -14,434,114 |

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2022 | $ -14,434,114 | $ 5,175,647 | $ 2,193,555 | $ -17,416,207 |
| 2023 | $ -17,416,207 | $ 4,317,859 | $ 2,259,361 | $ -19,474,705 |
| Total | | $ 40,108,973 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at the end of their useful life (as per PSAB)
- Existing backlog of bridge replacements would all be completed in year one of Asset Management Plan
- These values will change over time due to technology changes, changes in materials, etc.
- These values do not include engineering fees, estimate at 8–10% of project costs

This chart illustrates that over the course of the next 10 years the current Tax Supported Capital Levy is insufficient to finance the Asset Management Plan expenditures. At the end of 2023 there is a deficit of $19,474,705. In the absence of additional government funding or cost savings, an annual Total Tax Levy increase of 15% for each of the next ten years would be needed to reduce this deficit to zero by the end of the decade. Total Tax Levy increases of this magnitude are not received favourably by tax payers. By taking a longer term view this Total Tax Levy increase can be reduced. This will be discussed in the Long-term Financial Strategy section.

### 5.1.4 Addressing the 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 Township should develop a process to continually enhance this Plan over the next few years. This would include more detailed service levels and additional condition/risk information.

2. The issuance of debt to reduce tax rate increases is sometimes viewed as a feasible option. It must be recognized that debt offers short-term relief but long-term pain. Money borrowed today must be paid back in the future with interest. The Township of Wilmot will be debt free as of 2014, and therefore Council should establish criteria for the issuance of future debt, such as: debt should be restricted to critical health and safety projects.

3. Continuing to pursue Provincial and Federal grants whenever possible. The Plan assumes no grant funding from the Provincial and Federal Governments. This is a conservative approach that is recommended in the Provincial Government's Asset Management template. Both senior levels

of government have acknowledged that they should share in addressing the infrastructure deficit. It is reasonable to assume that funds will become available in the future from both senior levels of government. The Township of Wilmot should continue to develop a methodology of securing a share of these funds.

## 5.2 LONG-TERM FINANCIAL STRATEGY – 2014 TO 2115

### 5.2.1 Water Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures on water infrastructure over the next 100 years, separated into decades, are displayed in the following chart.

**Table 5-4: 100 Year Water Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 429,478 | $ 3,838,002 | $ 4,430,285 | $ 1,021,761 |
| 2024-2033 | $ 1,021,761 | $ 7,388,169 | $ 5,953,933 | $ -412,476 |
| 2034-2043 | $ -412,476 | $ 2,409,651 | $ 8,001,587 | $ 5,179,460 |
| 2044-2053 | $ 5,179,460 | $ 26,107,157 | $ 10,753,464 | $ -10,174,233 |
| 2054-2063 | $ -10,174,233 | $ 28,359,544 | $ 14,451,757 | $ -24,082,020 |
| 2064-2073 | $ -24,082,020 | $ 39,275,938 | $ 19,421,953 | $ -43,936,005 |
| 2074-2083 | $ -43,936,005 | $ 110,447,696 | $ 26,101,481 | $ -128,282,221 |
| 2084-2093 | $ -128,282,221 | $ 22,735,466 | $ 35,078,207 | $ -115,939,480 |
| 2094-2103 | $ -115,939,480 | $ 33,765,048 | $ 47,142,177 | $ -102,562,351 |
| 2104-2113 | $ -102,562,351 | $ 18,651,805 | $ 63,355,144 | $ -57,859,012 |
| Total | | $ 292,978,478 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at the end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

This chart illustrates that over the course of the next 100 years the current Water Capital Levy is insufficient to finance the Asset Management Plan expenditures. By the end of the 100 years, additional financing of $57,859,012 will need to be applied to the Total Water User Fees Supported capital program.

In the absence of additional government funding or cost savings, an annual increase to total water user fees of approximately 0.15% will raise sufficient funds to finance the $57,859,012 deficit. This is displayed in the following chart.

**Table 5-5 Revised 100 Year Water Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Revised Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 429,478 | $ 3,838,002 | $ 4,623,131 | $ 1,214,606 |
| 2024-2033 | $ 1,214,606 | $ 7,388,169 | $ 6,583,751 | $ 410,187 |
| 2034-2043 | $ 410,187 | $ 2,409,651 | $ 9,224,242 | $ 7,224,779 |
| 2044-2053 | $ 7,224,779 | $ 26,107,157 | $ 12,778,509 | $ -6,103,869 |
| 2054-2063 | $ -6,103,869 | $ 28,359,544 | $ 17,560,898 | $ -16,902,515 |
| 2064-2073 | $ -16,902,515 | $ 39,275,938 | $ 23,993,868 | $ -32,184,586 |
| 2074-2083 | $ -32,184,586 | $ 110,447,696 | $ 32,645,167 | $ -109,987,115 |
| 2084-2093 | $ -109,987,115 | $ 22,735,466 | $ 44,277,805 | $ -88,444,776 |
| 2094-2103 | $ -88,444,776 | $ 33,765,048 | $ 59,917,205 | $ -62,292,618 |
| 2104-2113 | $ -62,292,618 | $ 18,651,805 | $ 80,941,449 | $ -2,975 |
| Total | | $ 292,978,478 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

### 5.2.2 Wastewater Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures on wastewater infrastructure over the next 100 years, separated into decades, are displayed in the following chart.

**Table 5-6: 100 Year Wastewater Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 580,893 | $ 0 | $ 3,504,554 | $ 4,085,447 |
| 2024-2033 | $ 4,085,447 | $ 0 | $ 4,709,827 | $ 8,795,274 |
| 2034-2043 | $ 8,795,274 | $ 16,417,909 | $ 6,329,614 | $ -1,293,021 |
| 2044-2053 | $ -1,293,021 | $ 18,359,389 | $ 8,506,472 | $ -11,145,939 |
| 2054-2063 | $ -11,145,939 | $ 7,781,439 | $ 11,431,987 | $ -7,495,391 |
| 2064-2073 | $ -7,495,391 | $ 21,325,153 | $ 15,363,634 | $ -13,456,909 |
| 2074-2083 | $ -13,456,909 | $ 94,230,282 | $ 20,647,440 | $ -87,039,751 |
| 2084-2093 | $ -87,039,751 | $ 16,889,158 | $ 27,748,433 | $ -76,180,476 |
| 2094-2103 | $ -76,180,476 | $ 0 | $ 37,291,573 | $ -38,888,903 |
| 2104-2113 | $ -38,888,903 | $ 103,263,210 | $ 50,116,756 | $ -92,035,358 |
| Total | | $ 278,266,540 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

This chart illustrates that over the course of the next 100 years the current Wastewater Capital Levy is insufficient to finance the Asset Management Plan expenditures. By the end of the 100 years, additional financing of $92,035,358 will need to be applied to the Total Wastewater User Fees Supported capital program.

In the absence of additional government funding or cost savings, an annual increase to total wastewater user fees of approximately 0.25% will raise sufficient funds to finance the $92,035,358 deficit. This is displayed in the following chart.

**Table 5-7: Revised 100 Year Wastewater Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Revised Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 580,893 | $ 0 | $ 3,803,743 | $ 4,384,636 |
| 2024-2033 | $ 4,384,636 | $ 0 | $ 5,691,550 | $ 10,076,185 |
| 2034-2043 | $ 10,076,185 | $ 16,417,909 | $ 8,244,195 | $ 1,902,471 |
| 2044-2053 | $ 1,902,471 | $ 18,359,389 | $ 11,690,744 | $ -4,766,174 |
| 2054-2063 | $ -4,766,174 | $ 7,781,439 | $ 16,339,058 | $ 3,791,445 |
| 2064-2073 | $ 3,791,445 | $ 21,325,153 | $ 22,602,884 | $ 5,069,176 |
| 2074-2083 | $ 5,069,176 | $ 94,230,282 | $ 31,038,278 | $ -58,122,827 |
| 2084-2093 | $ -58,122,827 | $ 16,889,158 | $ 42,392,544 | $ -32,619,440 |
| 2094-2103 | $ -32,619,440 | $ 0 | $ 57,670,009 | $ 25,050,569 |
| 2104-2113 | $ 25,050,569 | $ 103,263,210 | $ 78,220,416 | $ 7,775 |
| Total | | $ 278,266,540 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

### 5.2.3 Tax Supported Assets – Review of Revenues and Capital Expenditures

The Revenues and Capital Expenditures on roads, bridges, and storm infrastructure over the next 100 years, separated into decades, are displayed in the following chart.

**Table 5-8: 100 Year Roads, Bridges, and Storm Infrastructure Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 783,274 | $ 40,108,973 | $ 19,850,995 | $ -19,474,705 |
| 2024-2033 | $ -19,474,705 | $ 51,206,878 | $ 26,678,077 | $ -44,003,506 |
| 2034-2043 | $ -44,003,506 | $ 63,753,435 | $ 35,853,104 | $ -71,903,837 |
| 2044-2053 | $ -71,903,837 | $ 118,369,195 | $ 48,183,574 | $ -142,089,459 |
| 2054-2063 | $ -142,089,459 | $ 287,011,028 | $ 64,754,694 | $ -364,345,792 |
| 2064-2073 | $ -364,345,792 | $ 168,261,425 | $ 87,024,894 | $ -445,582,323 |
| 2074-2083 | $ -445,582,323 | $ 531,222,762 | $ 116,954,181 | $ -859,850,905 |
| 2084-2093 | $ -859,850,905 | $ 406,278,814 | $ 157,176,640 | $ -1,108,953,079 |
| 2094-2103 | $ -1,108,953,079 | $ 380,564,962 | $ 211,232,260 | $ -1,278,285,781 |
| 2104-2113 | $ -1,278,285,781 | $ 1,144,156,546 | $ 283,878,494 | $ -2,138,563,833 |
| Total | | $ 3,190,934,021 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

This chart illustrates that over the course of the next 100 years the current Tax Supported Capital Levy is insufficient to finance the Asset Management Plan expenditures. By the end of the 100 years, additional financing of $2.14 billion will need to be applied to the Tax Supported capital program.

In the absence of additional government funding or cost savings, an annual increase to the tax levy of approximately 1.25% will raise sufficient funds to finance the $2.14 billion deficit. This is displayed in the following chart.

**Table 5-9: Revised 100 Year Roads, Bridges, and Storm Infrastructure Revenues and Capital Expenditures**

| Year | Opening Balance | Expenditures | Revised Capital Levy | Ending Balance |
|---|---|---|---|---|
| 2014-2023 | $ 783,274 | $ 40,108,973 | $ 25,254,192 | $ -14,071,507 |
| 2024-2033 | $ -14,071,507 | $ 51,206,878 | $ 45,188,064 | $ -20,090,321 |
| 2034-2043 | $ -20,090,321 | $ 63,753,435 | $ 73,543,251 | $ -10,300,505 |
| 2044-2053 | $ -10,300,505 | $ 118,369,195 | $ 113,433,924 | $ -15,235,777 |
| 2054-2063 | $ -15,235,777 | $ 287,011,028 | $ 169,075,600 | $ -133,171,205 |
| 2064-2073 | $ -133,171,205 | $ 168,261,425 | $ 246,168,143 | $ -55,264,487 |
| 2074-2083 | $ -55,264,487 | $ 531,222,762 | $ 352,411,063 | $ -234,076,187 |
| 2084-2093 | $ -234,076,187 | $ 406,278,814 | $ 498,196,704 | $ -142,158,296 |
| 2094-2103 | $ -142,158,296 | $ 380,564,962 | $ 697,542,602 | $ 174,819,343 |
| 2104-2113 | $ 174,819,343 | $ 1,144,156,546 | $ 969,345,352 | $ 8,149 |
| Total | | $ 3,190,934,021 | | |

This chart assumes:

- All expenditures are in 2013 dollars plus 3% annually for inflation
- The amount of the Capital Levy will be increased by the 3% inflation rate in each future year
- Assets are replaced at end of their useful life (as per PSAB)
- These values will change over time due to technology changes, changes in materials, etc.

While this increase will address the financing shortfall in the next 100 years, it is important to note the financing shortfall in each of the first eight decades. If additional financing becomes available then it should be applied to the early years of this financing scenario.

### 5.2.4 Addressing the Long-Term Financial Shortfall

Significant financing will be required to meet the peak years over the life cycle of all assets to make sure that service levels can be sustained in perpetuity.

The best strategy to address the long-term financing shortfall is to develop improved asset management tools and processes. This will allow the Township of Wilmot to prepare a more refined estimate of the infrastructure needs that is not simply based on replacing infrastructure when it is at the end of its useful life. These strategies will include the following:

Review and adjust levels of service and establish the associated performance metrics to track how well the infrastructure is meeting the service levels. This may result in some higher-risk assets being renewed at a later time than what was established in the analysis performed in this Plan. However, this may also result in some lower-risk assets becoming a priority for renewal at an earlier time than what was established in this Plan.

- Collect and review additional condition/performance information for the Township's infrastructure to better assess the probability of failure.

- Consider non-infrastructure solutions to achieve service levels.

- Consider consolidating or eliminating redundant infrastructure.

# 6 Conclusion

This project to create an asset management plan for Wilmot Township has resulted in a number of benefits, some of which are outlined below:

1. The AMP provides an excellent baseline to measure against and build on going forward;
2. The AMP satisfies the MOI requirements and guidelines;
3. The project has produced a consolidated inventory of infrastructure assets including a GIS deliverable for accessing information via a mapping interface;
4. The AMP includes advanced financial analysis for capital and operational planning; and
5. The AMP provides a series of recommendations summarized in the table below:

**Table 6-1: Recommendation Summary**

| | | Recommendation Summary |
|---|---|---|
| Asset Management Strategy | Non-Infrastructure Solutions | 1. Consider undertaking an Infrastructure Master Plan<br>2. * Align 10-Year Forecast with proposed maintenance, renewal/rehabilitation, and replacement activities. Continue this with bridges and begin alignment with roads and underground infrastructure. |
| | Maintenance Activities | 1. Compile all asset information for roads, bridges, and underground infrastructure into a database<br>2. Continue bridge OSIM inspections every two years<br>3. Formalized Road Inspection Program to collect PCI & AADT<br>4. * CCTV Inspection Program for underground infrastructure via a reputable contractor certified in current inspection standards |
| | Renewal/ Rehabilitation Activities | 1. Continue implementing bridge rehabilitation recommendations from OSIM Inspections<br>2. Continue road rehabilitation based on Road Inspection Program<br>3. * Continue spot repairs for underground infrastructure based on CCTV Inspection Program along with Inflow & Infiltration studies |
| | Replacement Activities | 1. Continue implementing bridge replacement recommendations based on OSIM Inspections provide recommendations on bridge replacement activities. * Undertake road replacement based Road Inspection Program, PCI & RCR scores<br>2. * Coordinate & align underground infrastructure replacement with road reconstruction and bridge program. |
| | Disposal Activities | 1. * Proper disposal of bridges, roads, and underground infrastructure should continue to occur |
| | Expansion Activities | 1. Ensure Baden and New Hamburg's water and wastewater networks can accommodate the expected growth over the next 10 years.<br>2. Update water and sewer models and complete a hydraulic assessment to |

| | | Recommendation Summary |
|---|---|---|
| | | ensure all systems are under capacity and have capacity available for expansion. The Township should receive a copy of all modelling exercises in their specified format.<br>3. * Utilize the Region of Waterloo's water and sewer models |
| | Procurement Methods | 1. * Coordinate adjacent infrastructure projects with neighbouring municipalities and the Region of Waterloo<br>2. Right-of-way view based on spatial analysis and GIS tools to look at asset proximity and adjacency when developing the in-year capital program |
| | Risk | 1. * Continue hiring subject matter experts to review work completed by Township or clients to ensure the consistency in deliverables |
| Financial Strategy | Short-Term Financing | 1. * Continue to revise and adjust the Implementation Strategy to improve the Financial Strategy<br>2. Establish criteria for the issuance of future debt<br>3. * Continue to pursue Provincial and Federal grants whenever possible |
| | Long-Term Financing | 1. * Review & complement existing levels of service and establish performance metrics to track how well the infrastructure is meeting the service levels<br>2. * Collect and review additional condition/performance information for the Municipality's infrastructure to better assess the probability of failure<br>3. * Consider non-infrastructure solutions to achieve service levels. Consider consolidating or eliminating redundant infrastructure. |

*Denotes recommendations and activities currently undertaken by Township staff

### 6.1.1 Future Considerations

The AE project team and TCA Consulting have worked closely with key staff members at the Township of Wilmot to produce an AMP that aligns with citizen and Council priorities, is financially achievable, and resonates with Township staff. A number of digital deliverables were produced and are summarized below:

- Asset Condition Spreadsheet – Microsoft Excel
- Financial Analysis Spreadsheet – Microsoft Excel
- GIS file – Manifold format with Microsoft Access Database
- Web Mapping Site – AutoDesk MapGuide format – hosted by AE
- Asset Management Plan – Microsoft Word & PDF

An important consideration moving forward is to ensure that these deliverables are updated and maintained for future use and benefit. As updates are made for the digital deliverables it is important that specifications are included in the procurement process and adhered to during the review and acceptance period.

# Appendix A – Asset Inventory Spreadsheets

Please note that there are blanks present in the spreadsheets. These blanks indicate data that is not known, not available or was not evaluated at the time of this Asset Management Plan. These spreadsheets show the most up-to-date data available as of November 2013.

# Appendix B - Financial Valuation Spreadsheets

# Appendix C - Asset Condition Mapping

# Appendix D - Level of Service Workshop