RECORD OF REVISIONS

Version/Revision No.	Description of Revision	Date
Original	--	March 2014
Revision 1	2016 Update: The key updates included: • Update of conditions and replacement profile to incorporate these assets: recreation equipment/facilities, streetlights and land improvements, as well as • Update of asset value allocations for 2017 and 2018 (based on data provided by the Township).	March 2017

EXECUTIVE SUMMARY

Public infrastructure is central to our prosperity and our quality of life. The majority of public infrastructure in Canada is the responsibility of the municipal government, and most people take for granted the important role of these assets. Adequate municipal infrastructure such as roads, bridges, and underground water and sewage pipes are essential to economic development, citizen safety, and quality of life. Well maintained infrastructure is critical in sustaining a municipality as an attractive place to live and do business.

The Township of Southwold (Township) has placed asset management as a strategic priority. The present AMP report, along with the asset management tools delivered to the Township, will assist staff in making the most cost-effective decisions with regards to rehabilitation or replacement of their infrastructure. It will also ensure that the limited funds made available for infrastructure renewal are spent wisely, and that staff decisions are supported by sound technical data and analysis.

In 2013, Dillon Consulting Limited (Dillon) was retained by the Township to develop an Asset Management Plan (AMP), which will contribute to Southwold's eligibility for provincial funding under the Municipal Infrastructure Investment Initiative (MIII) program. Eligibility rules for MIII funding indicate that municipalities must prepare an AMP to ensure that the funds provided by the Province are spent in a cost-effective manner. Municipalities must also prove in their submission that they have acquired suitable asset management tools that will assist staff in managing its infrastructure assets in the future. These tools and systems will ensure that municipalities continue to provide an adequate level of service to their residents and create a solid foundation for economic prosperity.

An update to the AMP was initiated in 2016, the purpose of which was to reflect any changes to the existing infrastructure networks and budgets in the plan, and to expand the plan to include additional Township infrastructure networks not previously included within the AMP.

State of Local Infrastructure

It is often suggested in literature that 2% to 4% of the value of an asset should be spent yearly to ensure sustainability of the assets. Without asset management tools, it is almost impossible to determine the long term effect of inadequate annual allocations. Yet, it is important for a municipality to determine if the current level of funding is appropriate to continue to provide an adequate level of service to its residents. It is also essential to allocate adequate funding to ensure sustainability of the assets in the future. For the Township, the value of the assets was estimated at just under $99 million. The following table shows the distribution of that asset value.

Asset Value		
Infrastructure Network	**Quantity**	**Current Replacement Cost**
Sanitary Sewer	2 km	$1,015,870
Water	247 km	$19,597,324
Roads	217 km	$66,158,496
Sidewalks	8 km	$787,777
Building Facilities	23 buildings	$4,512,480
Bridges	7 structures	$3,235,837
Culverts	12 structures	$2,819,400
Streetlights	41 sections	$446,864
Recreation Equipment	15 assets	$428,134
Land Improvements	9 assets	$191,228
Total Asset Value		**$98,127,184**

Based on these results and the recommended 2% yearly investment in maintenance, theoretically the Township should allocate around $1.9 million per year to ensure future sustainability of its assets.

Needs Summary

An analysis scenario assuming an unlimited annual budget is utilized to gain insight on the state of local infrastructure. Although an unlimited budget is not a reality for any municipality, the scenario demonstrates the backlog of repairs that have been neglected over the years due to a lack of funding. The results define the extent of the infrastructure needs that currently exist in the Township, indicating that a backlog exists. Of note, the Township infrastructure is in above average condition when compared to other municipalities. Most municipalities in Canada are in a much worse situation.

Analysis was completed on the Township networks and assets to determine the initial needs of the system in 2014. The analysis was then updated in 2016 to reflect current asset values (Revision 1) and to understand the needs within the upcoming year for the Township infrastructure.

Through the analysis of the linear networks, it was found that current needs are present within the paved road and sidewalk networks. No immediate needs within one year were identified with the water, sanitary sewer or gravel road networks. The following table presents a summary of the current linear network needs.

Summary of Current Linear Network Needs				
Network	**Current Length**	**No. of Sections**	**% of Network in Need**	**Estimated Expenditure**
Paved Roads	70 km	45	3%	$2,081,537
Sidewalks	7.6 km	33	1%	$9,000

Similarly, analysis was conducted for the point assets within the Township to determine current needs. Needs were identified for buildings and facilities, bridges and culverts, streetlights, recreation equipment, and land improvements. The following table presents a summary of the current point asset needs.

Summary of Current Point Asset Needs					
Asset Type	**Type**	**No. of Facilities**	**Facilities in Need**	**% of Network in Need**	**Estimated Expenditure**
Buildings & Facilities	Administrative	3	2	-	$594,200
	Fire Department	3	2	-	$430,200
	Public Works	5	-	-	$251,347
	Recreation	11	-	-	-
	Water	1	-	-	-
Bridges & Culverts	Bridges	7	-	-	-
	Culverts	12	6	50%	$1,181,784
Streetlights		41	6	-	$43,842
Recreation Equipment		15	9	-	$278,800
Land Improvements		9	-	-	-

Asset Management Strategy

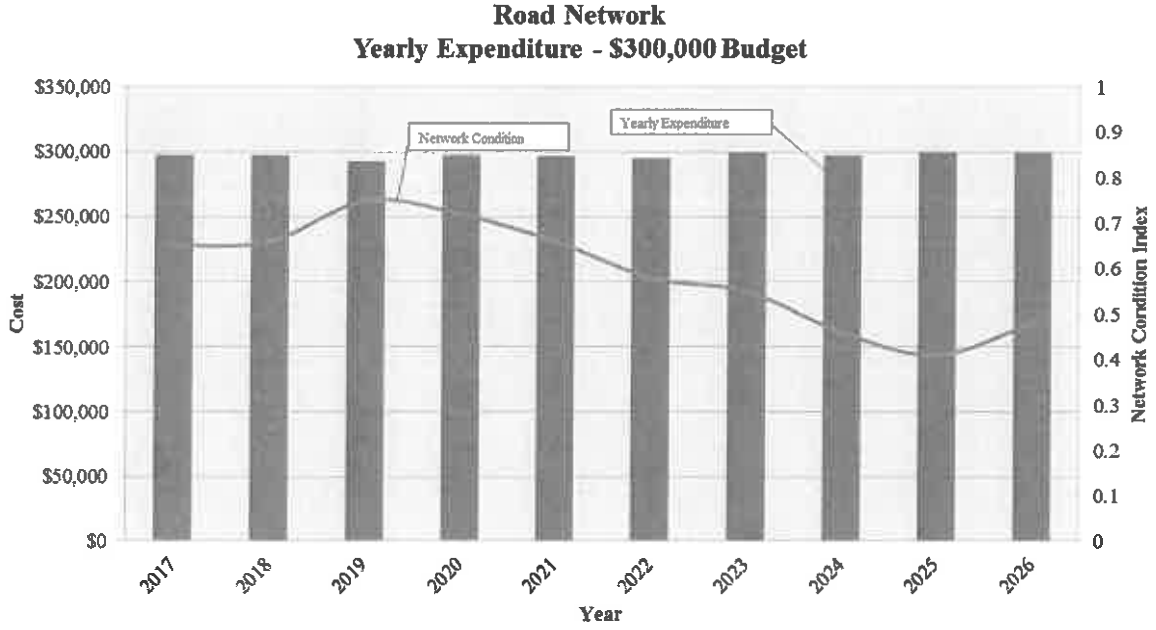
A 10 year capital plan was developed based on the condition of the infrastructure and levels of service being provided by the Township. Different yearly allocations were analyzed to determine the appropriate annual budget which would result in maintaining the current level of service offered to the residents for the next 10 years, and to analyze the impact of maintaining current budget amounts.

Using the DPSS asset management tool described in **Section 3.4**, it is possible to analyze the effect of different budget scenarios on the road network. Depending on the allocated annual budget, the level of service may decrease, remain constant, or increase over time. The additional linear and point assets were analyzed using the Excel-based AMP tool to develop a strategy for the 10 year timeframe.

Current Funding Level

Road Network

An initial value of $300,000 annually was input into the program to analyze the expenditures incurred for the road network, and its effect on the overall condition index. This allocation was determined using an approximate average for the annual capital allocation for roads, as provided by the Township during initial development of the AMP. The results in the following figure show that maintaining the initial allocation of funding will result in a decrease in the overall network condition index.



Road Network Performance – Initial Allocations

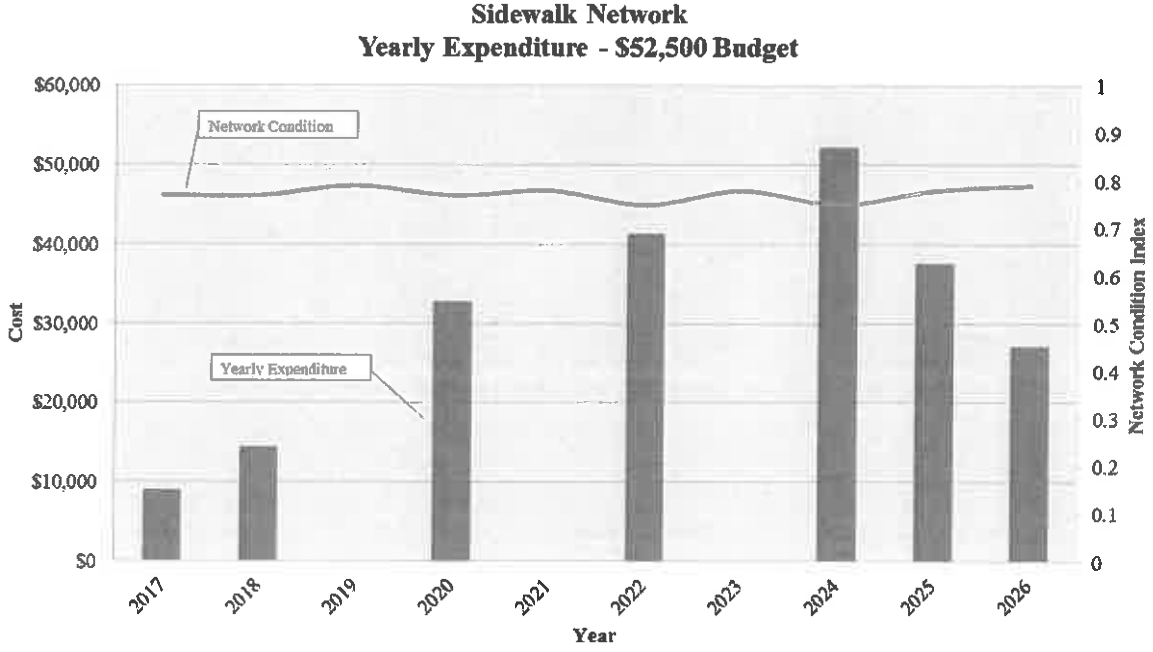
According to this scenario, the initial allocation for funding for roads is insufficient if the Township wishes to maintain their current level of service. Based on the outcomes of the AMP analysis, the Township has opted to maintain a $600,000 annual budget for the road network.

Additional Infrastructure

No detailed condition assessment survey was carried out on the remaining Township networks and assets. To develop a capital program, we have used the collected data, which included information on year of construction, service lives and replacement costs. Using that information, we have approximated timing for rehabilitation and replacement of each of the remaining linear networks and point asset infrastructure.

The condition of the water and sanitary sewer networks is such that within a 10-year timeframe, repair is not required. The Township should not require significant additional expenditure to maintain these assets.

The condition of the sidewalk network is such that needs are incurred in multiple years within a 10-year timeframe. The network was analyzed with an annual allocation of $52,500. The magnitude of expenditure and related network condition are shown below.

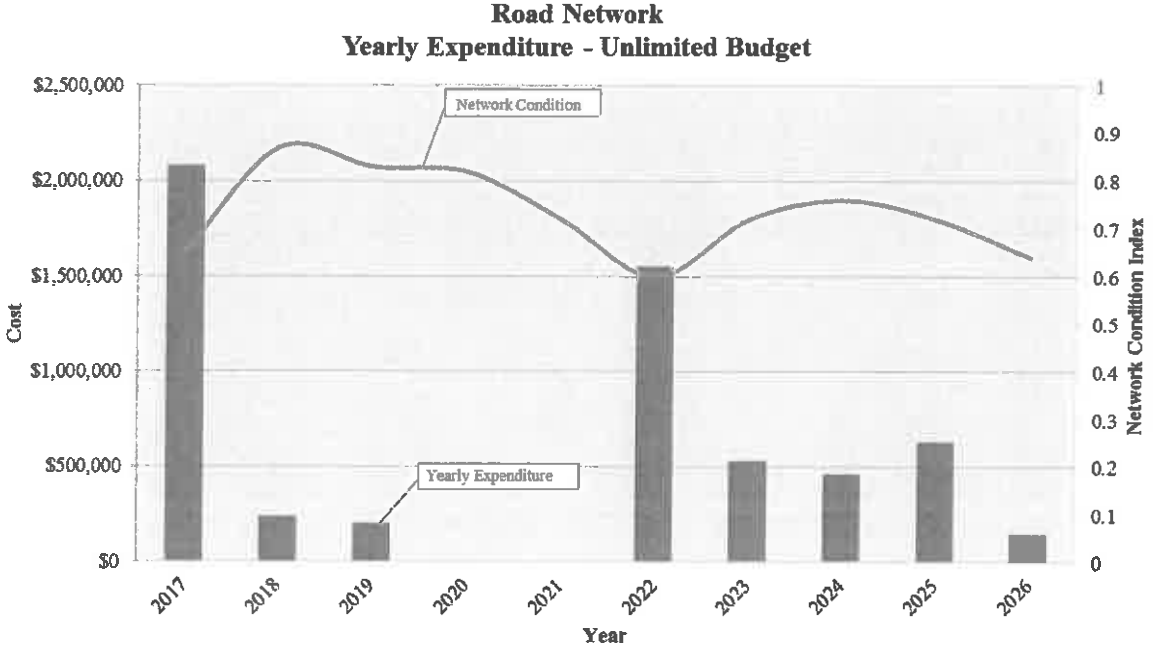


Sidewalk Network Performance – Current Allocations

The funding level for the sidewalk network is shown to be adequate.

Required Funding – Road Network

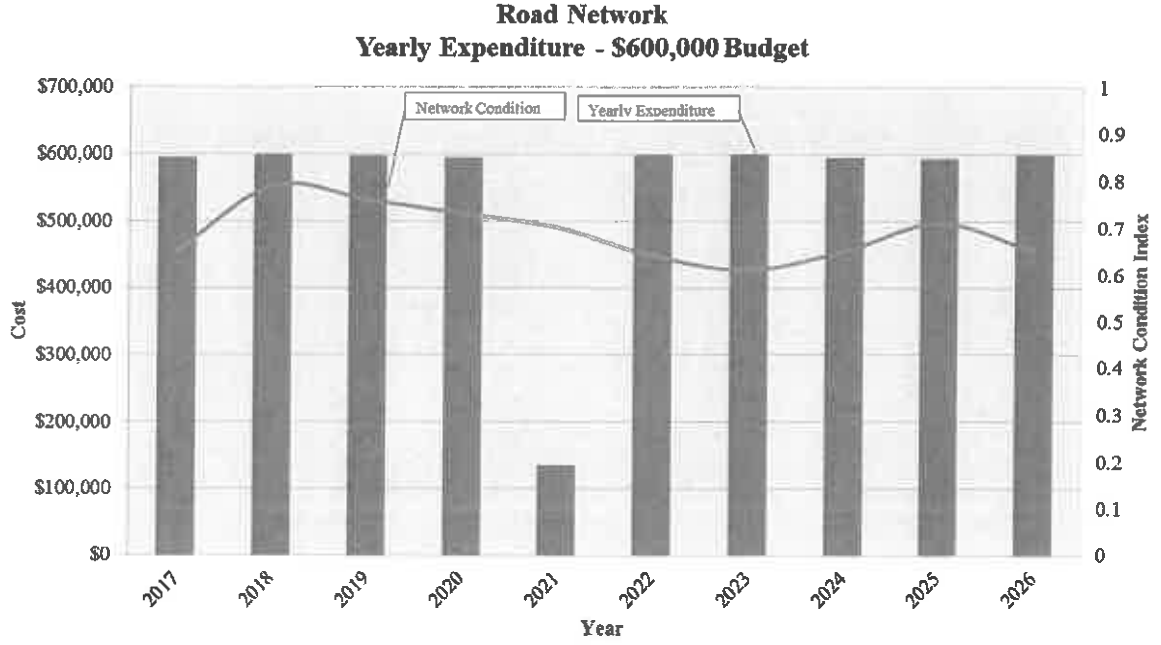
To determine the level of funding required to maintain the level of service for the road network, a ten year scenario was initially run with an unlimited budget. The results demonstrated that the current level of service is high, and the costs for the first year of the plan are extensive.



Road Network Performance - Unlimited Budget

The unlimited scenario shows that the road network undergoes a significant cost of rehabilitation in what appears to be a cyclical manner. The high funding requirements identified every 6 to 7 years are the results of the short service life of surface treated roads which is usually in the 7 to 10 year range. Therefore, a budget which reflects the changing magnitude of needs would suit the Township. It is also noted that the current average index of the network is high. Typically, an average index of 0.6 is considered very acceptable in the industry. The Township road network is above average, and can therefore stand to reduce funding allocation to the road network while still maintaining an acceptable level of service.

The annual allocation that would maintain the current, or typical, level of service of the road network over the next 10 years was determined. Based on our analysis, an annual allocation of $600,000 would be required to provide an adequate level of service to the residents of Southwold. This budget scenario was developed in 2013 to include an allocation of $200,000 in 2014, $400,000 in 2015, and subsequently $600,000 annually. The annual budget was increased to $600,000 to accommodate an increase in needs on the network. The results are demonstrated below.



Road Network Performance - Allocations to Maintain Level of Service

The condition index of the network fluctuates, however the average index remains at approximately 0.6 to 0.7 throughout the duration of the 10-year timeframe.

A detailed list of network repairs is included in **Appendix A.**

A list of repairs for point assets is also included in **Appendix A.**

Summary

As evidenced through the results of the DPSS budget scenarios, the Township has allocated annual budget values that are sufficient to maintain a good level of service for their linear infrastructure. It is recommended to re-assess the road condition network on a regular basis to better assess the performance and allow better management of the shortfall or network needs in the future.

Financing Strategy

Financing infrastructure needs has become a very serious issue. Asset managers need to identify better practices and innovations in infrastructure financing if municipalities and other levels of government want to continue to provide an adequate level of service to tax payers in an affordable manner. Asset managers need to come up with innovative solutions to address that infrastructure deficit. Asset management systems are part of the solution but innovative financing and finding alternate revenue sources are an even bigger part of the solution.

Through this assignment we have developed, in collaboration with staff, an Asset Management (AM) Strategy. The strategy included funding requirements that would ensure sustainability of the assets to continue to provide an adequate level of service to the residents. The strategy developed is realistic and affordable. The Township has identified a source which will support the Asset Management Plan (AMP) developed through this report. The primary funding source in the Township is reserves, supplemented periodically by federal or provincial funding. These financing sources will address a significant portion of the infrastructure needs identified in this report, but additional external financing may be required to ensure sustainability of the assets to continue to provide an adequate level of service to the residents of the Township in the future.

Full details of the financial strategy developed for the Township can be found in Section 7.1.

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1.0 INTRODUCTION

1.1 Significance of Municipal Infrastructure

Public infrastructure is central to our prosperity and our quality of life. The majority of public infrastructure in Canada is the responsibility of the municipal government, and most people take for granted the important role of these assets. Adequate municipal infrastructure such as roads, bridges, and underground water and sewage pipes are essential to economic development, citizen safety, and quality of life. Well maintained infrastructure is critical in sustaining a municipality as an attractive place to live and do business.

The recent *Canadian Infrastructure Report Card* (2012), which addresses municipal roads and water systems, stated that approximately 30% of municipal infrastructure is in "fair" to "very poor" condition across Canada. The replacement value of these assets alone totals over $170 billion. This illustrates the importance of municipalities protecting their investment in infrastructure, and finding creative financial solutions to keep infrastructure in good operating condition. One of the solutions to Canada's infrastructure issues is improved asset management practices.

The Township of Southwold (Township) has placed asset management as a strategic priority. The present AMP report, along with the asset management tools delivered to the Township, will assist staff in making the most cost-effective decisions with regards to rehabilitation or replacement of their infrastructure. It will also ensure that the limited funds made available for infrastructure renewal are spent wisely, and that staff decisions are supported by sound technical data and analysis.

1.2 Purpose of the AMP

In 2013, Dillon Consulting Limited (Dillon) was retained by the Township to develop an Asset Management Plan (AMP), which will contribute to Southwold's eligibility for provincial funding under the Municipal Infrastructure Investment Initiative (MIII) program. Eligibility rules for MIII funding indicate that municipalities must prepare an AMP to ensure that the funds provided by the Province are spent in a cost-effective manner. Municipalities must also prove in their submission that they have acquired suitable asset management tools that will assist staff in managing its infrastructure assets in the future. These tools and systems will ensure that municipalities continue to provide an adequate level of service to their residents and create a solid foundation for economic prosperity.

The Ministry of Infrastructure of Ontario recognized that public infrastructure is central to prosperity and quality of life, as municipalities deliver many services that are critical to the public. Many of these services rely on well planned and maintained infrastructure. All levels of government also understand that they have an obligation to address the ever increasing infrastructure challenges, to ensure that they can continue providing an adequate level of service to tax payers. In an effort to commence addressing these challenges, the Ministry has initiated a program and plan called *Building Together: Guide for Municipal Asset Management Plans* (2012). This program is meant to assist municipalities in developing a municipal infrastructure strategy. This strategy provides an opportunity for municipalities to address current and emerging infrastructure challenges. One of the main components of the strategy is to improve the current municipal infrastructure asset management practices. The first step for municipalities is to develop an AMP.

The province has indicated that any municipalities seeking provincial infrastructure funding must demonstrate that they have, or are in the process of developing an AMP, and how its proposed project funding requests fit within a detailed AMP. The AMP should not only address the current needs in infrastructure, it should also identify future needs and a financing short and long-term strategy to fund those needs.

The AMP will assist municipalities in making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The intent of the plan is to make the best use of the funds available while managing risk and continuing to provide adequate levels of service to the public.

An update to the AMP was initiated in 2016, the purpose of which was to reflect any changes to the existing infrastructure networks and budgets in the plan, and to expand the plan to include additional Township infrastructure networks not previously included within the AMP.

1.3 Township of Southwold

The Township of Southwold falls within Elgin County in the Province of Ontario. The Township is located in Southwestern Ontario, with its southeastern border located along the shore of Lake Erie. The Township has a population of approximately 4,500 people, and an area of just over 300 square kilometers. ***Figure 1*** illustrates the location of the Township.

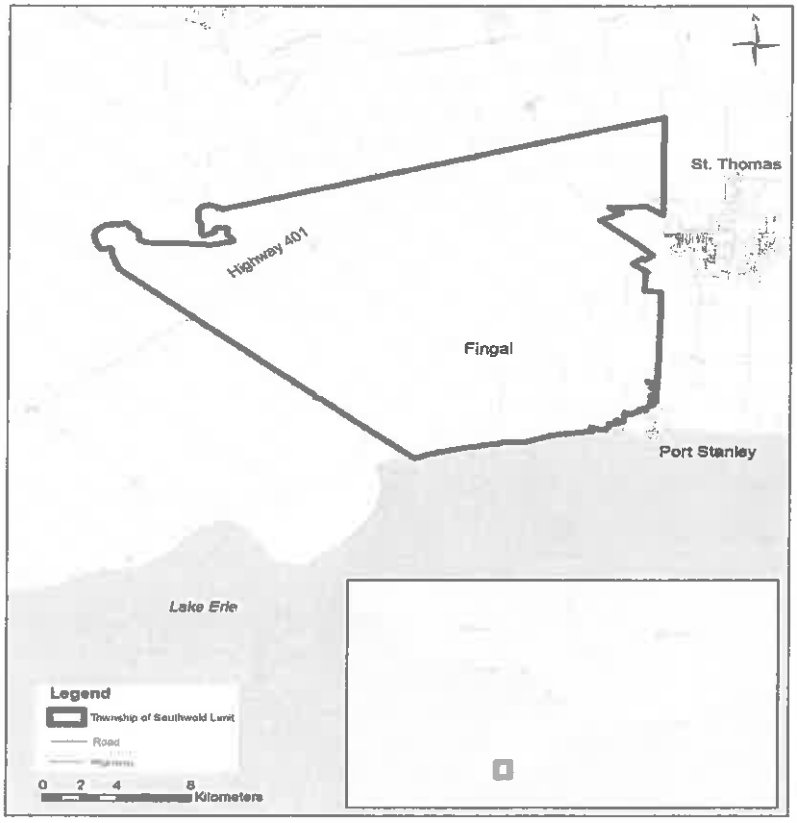

Figure 1: Township of Southwold - Location Map

The Township of Southwold is currently serviced with extensive water and wastewater infrastructure. There is also limited stormwater infrastructure within the Township.

1.3.1 Municipal Drinking Water System

The Township of Southwold has a municipal water distribution system that is outlined in the Quality Management System Operational Plan for the system. The system serves the majority of Township residents.

Treated potable water is provided from the St. Thomas Secondary Water Supply System and the St. Thomas Water Distribution System. Water enters the Southwold Distribution System from the following two points of entry:

- St. Thomas Secondary Supply System: Talbotville Interconnect Control Chamber
- St. Thomas Distribution System: Elgin Manor Interconnect

Water is supplied to the Municipality of Dutton-Dunwich's Water Distribution System via the Iona Interconnect Control Chamber located at the intersection of Talbot Line (Highway 3) and Iona Road.

The Southwold Water Distribution System includes 25 customers, located north of the Green Lane Environmental Landfill Site, in the Municipality of Middlesex Centre.

In the case of an emergency, potable water can be supplied to the Township of Southwold's Water Distribution System, from the Dutton-Dunwich (West Elgin Area Water Supply System) Distribution System via the Iona Interconnect Control Chamber.

A Rechlorination Facility, located northeast of the Hamlet of Shedden, provides secondary disinfection or 'top-up' chlorination using sodium hypochlorite within the Township of Southwold. The Shedden Rechlorination Facility consists of the following:

- One duty and one standby sodium hypochlorite metering pump
- One sodium hypochlorite storage tank with a spill containment basin
- Two online chlorine residual analyzers

The Township of Southwold does not currently have any water treatment or potable water storage infrastructure within the municipal boundary. Treated water storage provides a benefit to a distribution by providing extended storage, equalization storage and emergency storage for a system. Council has identified incorporating water storage into its distribution system as a priority.

1.3.2 Municipal Sanitary Sewage System

The Township of Southwold has sanitary sewage services limited to the Ferndale area and Lynhurst area, west of Wellington Road and south of McBain Line, and also south of Ford Road. These sanitary sewers drain to the existing St. George Street Sewage Pumping Station that transfers sewage to the City of St. Thomas Wastewater Treatment Plant.

The Township of Southwold does not currently have any other sanitary sewers or any municipal wastewater treatment infrastructure within the municipal boundary. Council has identified sanitary servicing as a priority for selected areas.

2.0 PROJECT TEAM

To ensure that all technical and financial aspects of the plan were addressed, the Township included representatives from relevant departments in the project. The project team representatives from the Township of Southwold included: Chief Administrative Officer (CAO) / Clerk, Treasurer and other technical staff.

These individuals participated at different phases in the preparation of the plan. Their involvement will continue in the future to ensure that the plan remains relevant and useful in properly managing the Township's infrastructure assets.

2.1 Assets Included in the AMP

Ideally, municipalities should include all the capital assets owned and maintained by the municipality. However the funds currently made available by the province are mostly for infrastructure assets such as roads, bridges, water and wastewater assets, and social housing. As recommended in the Guide for Municipal Asset Management Plans, the Township opted to develop a plan that includes all the primary assets. These infrastructure assets are considered essential to continue to provide an acceptable level of service to the public. The AMP was revisited in 2016 (Revision1) to include assets beyond the primary assets such as streetlights, recreational equipment and land improvement assets such as parking lots, driveways, fencing etc. The assets included in the AMP are:

- 247 kilometers of water network
- 2 kilometers of sanitary sewer network
- 8 kilometers of sidewalks
- 70 kilometers of paved roads
- 147 kilometers of gravel and dirt roads
- 19 bridge and culvert structures
- All Township buildings and facilities (including administrative, fire, public works and recreational facilities)
- 41 sections of streetlights
- 15 recreational equipment assets
- 9 land improvement assets (including parking lots, multi-activity pads, laneways, fencing, etc., and does not include properties.)

Detailed information of the linear and point asset networks can be found in the digital database delivered to the Township. The information is all included in the asset management tools delivered to the Township, to assist them in updating the AMP in the future. However, it is important to note that the AMP is not a static plan, and it will need to be updated as infrastructure is maintained and rehabilitated. The condition of the assets will also need to be reviewed as the assets continue to deteriorate over time.

The information provided to the Dillon team originated from the Township's existing databases, particularly those which were developed for Public Sector Accounting Board (PSAB) purposes. Less significant assets such as street signs and street lights were not initially considered within the Asset Management Plan; however some asset types were added during the 2016 update.

The maintenance of these assets is funded primarily through the operating budget on an as-needed basis, rather than being planned strategically in advance.

2.2 AMP Limitations

The AMP is a tool which is meant to be used to inform decision making. Other political, social, and environmental considerations should also be taken into account in planning capital investments. However, the AMP should provide a foundation on which those decisions are made.

In addition, the usefulness of the AMP is directly related to the quality of data used in its analysis. Both the Township staff and Dillon team involved in the project were committed to data accuracy, yet some assumptions had to be made in extenuating circumstances. As a whole, the AMP provides an accurate approximation of the Township's current and future infrastructure needs.

3.0 PROJECT METHODOLOGY

The general methodology we have adopted has been to follow the best practices from the *National Guide to Sustainable Municipal Infrastructure (2002)*, also known as the *InfraGuide*. The approach is described in five steps and was designed to help asset managers assess the level of service currently provided by their tangible assets. It allows asset managers to make fact-supported infrastructure investments decisions, while maximizing the effectiveness of available funds. In developing an AMP for the Township, each of the five steps, and their key elements, as presented below, were addressed. Each step is described in detail in the sections below.

1. **Infrastructure Data Inventory - *What infrastructure do you own?***
   - Analysis of existing data and optimization of data sources
   - Transfer of physical characteristic information into databases
   - Document inventory of all assets

2. **Replacement Costs - *What is it worth?***
   - Define bench-marking unit prices for replacement
   - Calculate replacement costs of all assets
   - Input information in analytical tools

3. **Condition Assessment - *What is its condition and remaining service life?***
   - Review of condition assessment data
   - Transfer of condition data to analytical tools
   - Computing condition assessment indices where appropriate
   - Statistical analysis of defects to assess life expectancy
   - Determination of service life of all infrastructure assets
   - Comparison with industry standards and definition of acceptable level of service

4. **State of Local Infrastructure Analysis-** ***What needs to be done to rehabilitate, replace, operate and maintain these assets?***
   - Upload condition data in asset management tools and process information
   - Review the effect of different repair alternatives
   - Consideration of lifecycle costs and extension of service life
   - Determine financial requirements to address needs identified

5. **Asset Management Strategy -** ***What should be done first and how much will it cost?***
   - Consideration of selected "what if" expenditure scenarios
   - Production of a prioritized short and long term AMP

The final part of this report which could be incorporated as an additional question to the list above is ***"How will you finance your plan?"*** To answer that question we have reviewed a variety of financing strategies which could be implemented to address the needs of all assets while maintaining an acceptable level of service to the residents.

3.1 Infrastructure Data Inventory

The Township possesses a large amount of inventory data in a variety of formats; therefore, no field data collection was required on this project. We worked closely with the Township staff to make best use of the valuable information they had.

We have developed a data prioritization process that identifies what data is considered essential, desirable or complementary in municipal infrastructure asset management. We followed that prioritization process for this assignment. Our experience has shown that much can be accomplished using only essential data to manage infrastructure assets. This approach produces valuable results at a much earlier stage in the development of a plan without large expenditures on asset condition assessment. The results can be refined over the years as more data becomes available. However, obtaining results, early in the implementation, will generate an immediate return on the investment.

It is recommended in the development of an AMP not to collect and store data just because the data is available. If the data does not add any value to the business processes, it should not be incorporated in the system. Usually, the financial investment and time spent keeping that information current could be better used elsewhere in the development of an AMP.

3.1.1 Linear Infrastructure Inventory – Road, Sewer, Water and Sidewalk Networks

The Township staff had already created a database for their linear infrastructure. The Dillon team reviewed that information and identified data gaps that needed to be addressed before processing data for the development of the AMP. Information such as year of construction, pipe diameter, material type, and pavement widths were some of the attribute information that was required in the development of the AMP. The project team worked closely with staff to address missing data or to make educated assumptions where the information was not available.

3.1.2 Point Asset Inventory – Bridge, Culvert, Building and Facility Assets

The main source of information for the point assets was from the database created to respond to the requirements of the Public Sector Accounting Board (PSAB). To meet the PSAB requirements, all municipalities must now produce an annual financial statement that takes into consideration the depreciation of all their Tangible Capital Assets (TCA). Municipalities had to generate an inventory of all their TCA, determine the year of construction or acquisition, estimate the acquisition cost based on historical cost or current replacement cost, and depreciate all assets to determine current residual value of those assets. Depreciating the asset involved assigning an expected service life to their assets. The PSAB information was very valuable to initiate the development of an asset management system, and the Dillon team took full advantage of it.

Although the PSAB information is a useful starting point, it was created to address financial accounting requirements. Engineering judgment must be applied to the PSAB information in order to make sound technical decisions with regards to renewal of municipal infrastructure.

The Dillon team, in collaboration with Township staff, reviewed all PSAB data and made appropriate adjustments to parameters such as service lives and replacement cost of an asset. The goal was to cater the existing information on current infrastructure conditions to the AMP development process.

3.2 Replacement Costs

Calculating the replacement costs of infrastructure assets provides insight on the existing financial investments on municipal infrastructure networks. To calculate overall replacement costs, each type of linear infrastructure was assigned an average unit cost per meter or square meter of construction. Unit construction costs were developed in collaboration with Township staff based on recent construction activities in the area. For the point assets such as bridges, culverts and buildings, the main source of information was the PSAB database. The values provided in the PSAB were inflated where required to obtain an approximation of the current replacement cost of the point assets.

3.3 Condition Assessment

The generation of condition indices, using consistent and repeatable techniques, is essential in comparing assets and identifying needs in all types of infrastructure. These indices are used to track improvements to the level of service in the condition of the asset network in the form of financial investment. All condition indices for Township assets ranged from 0 to 1, with 1 representing an asset in perfect condition. Once all assets were assigned a condition rating, knowledge of assets and technical expertise were used to determine rating level which represented the minimal level of service that can be provided to the residents. This was determined in consultation with Township staff. Any components of infrastructure rated below the minimal rating are to be repaired to improve the level of service. The minimum rating, or level of service, is called the "Threshold of Acceptability" of an asset.

The following illustrates graphically an example of performance thresholds and deterioration model used for water networks.

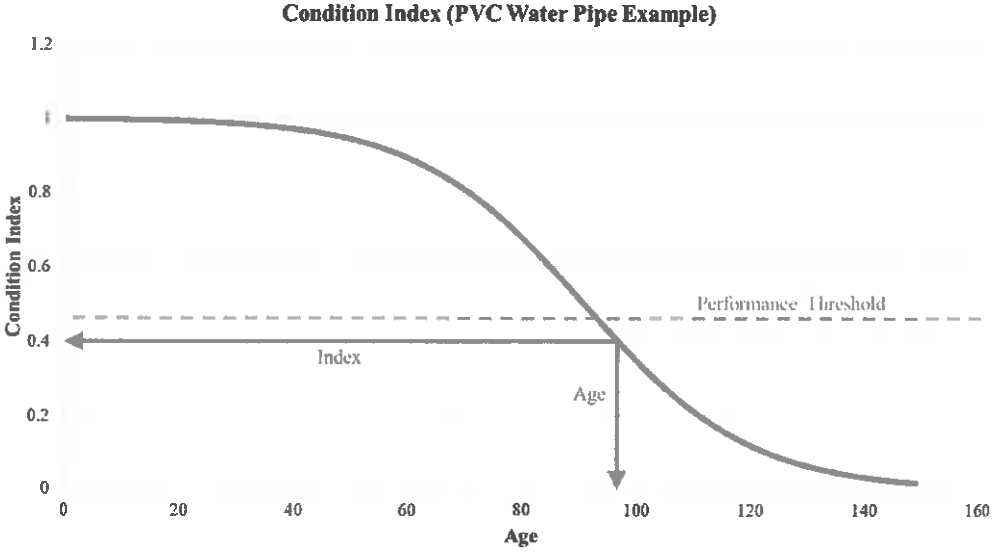

Figure 2: Determination of Condition Index

3.3.1 Road Network Condition Assessment Process

The Township had recently conducted a high level condition assessment survey to rate the roadway sections in the network. That information was used to analyze the overall condition of the road network and identify rehabilitation needs in the network. It is recommended that the Township conduct these types of road condition surveys on a regular basis (3 to 5 years) following the PCI method recommended by the Ministry of Transportation. The results of such a survey provides a much better indication of the current condition of the road network and provides a better base of information to predict the deterioration of road sections over time.

3.3.2 Water and Sewer Networks Condition Assessment Process

Budgetary constraints prohibited the possibility of conducting a condition assessment survey of the sewer and water networks. To overcome this limitation, statistically developed deterioration trends were used to approximate pipe condition based on the pipe's age and material type. This approach involved using linear deterioration models which were based on the age of the infrastructure, and the life expectancy as derived based on the asset material type. For high level financial analyses focused on asset sustainability of an infrastructure network, this approach is quite adequate.

Some water and sewer pipe segments had unknown ages and/ or material types. Where the information was unable to be located, assumptions were made based on the age and material of surrounding pipes.
All the assumptions made as part of the condition assessment process have been documented in the database.

3.3.3 Point Asset Condition Assessment Process

The condition assessment of the point assets was done using a similar approach to the water and sewer network assets. The Township provided life expectancy values for each type of asset, and the year of construction or last replacement. A linear deterioration trend was used to project the anticipated timing of replacement based on the data given.

3.4 State of Local Infrastructure Analysis

For linear network assets, the Dillon Predictive Scenario Software (DPSS) was used in preparing the capital investment analysis of the AMP. The tool is a Microsoft Access application that relies on an overall assessment of the infrastructure condition to produce investment scripts based on degradation curves, which are adjusted to the Township's particular operations and thresholds of acceptability.

The DPSS tool assesses the condition, and puts the Asset Manager in control of the life cycle of assets. It also allows for planning as to where, when, how and how much to invest in the renewal and replacement of infrastructures for the coming year, or for the next 5, 10, 20 or 50 years. ***Figure 3*** provides a view of a screen capture of the DPSS tool. Based on unit costs for rehabilitation of roadways provided by the Township, an AMP was developed using the tool.

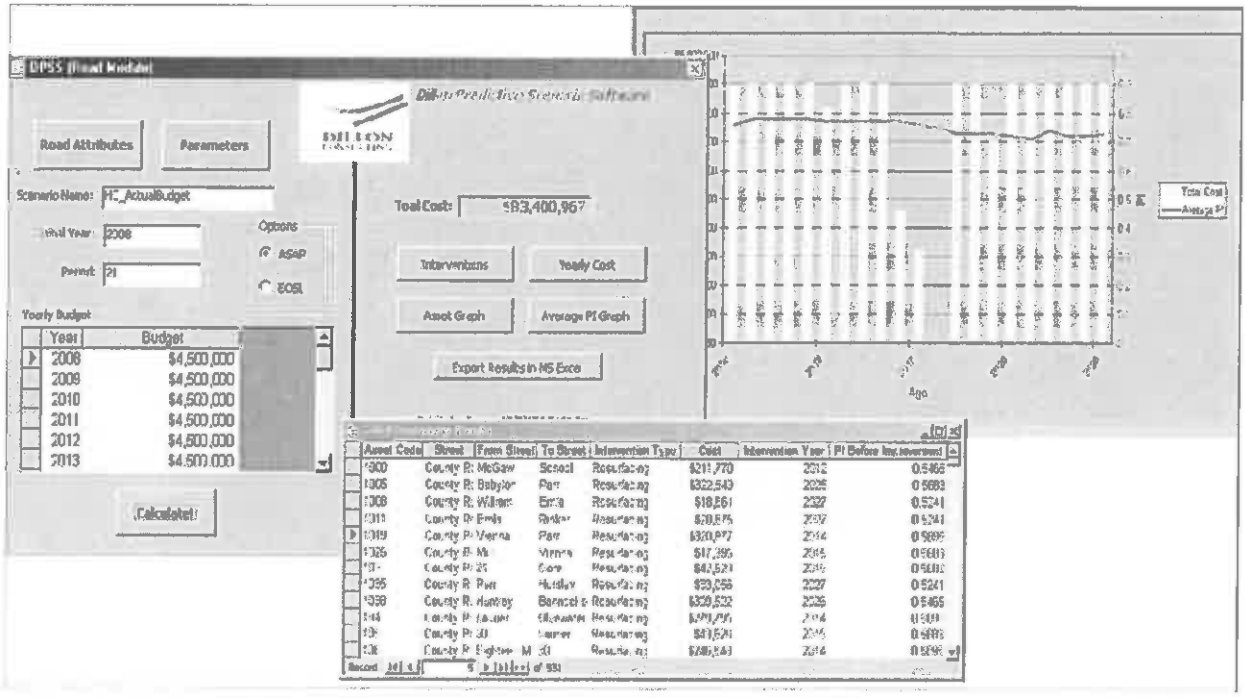

Figure 3: Dillon Predictive Scenario Software (DPSS)

For point assets, Dillon also developed a simple and practical tool to manage these types of assets. Point assets are assets such as bridges and culverts, building facilities, treatment plants and pump stations. These assets usually behave differently than linear assets because they are composed of many different components that have variable service lives. The service lives of these components can usually be obtained from sources such as:

- The supplier's suggested service life
- The experience of the technical expert performing condition assessment
- Published industry guides on service life and maintenance requirements

The AMP tool developed by Dillon has been designed to summarize in tabular and chart forms the maintenance and renewal costs of the components of the assets. The tool considers factors such as year of construction, expected service life, infrastructure needs, maintenance and replacement costs, and year of intervention. It has been successfully implemented in a many communities in across Canada. ***Figure 4*** illustrates the AMP tool interface. The tool can also be used to analyze linear assets, and this functionality has been implemented for this AMP to analyze linear infrastructure excluding roads.

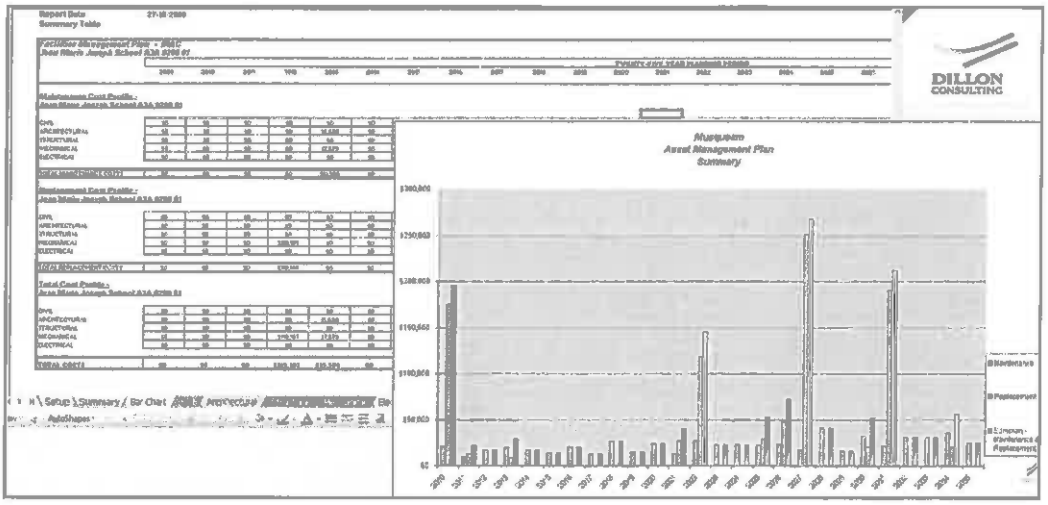

Figure 4: Condition Assessment Tool

This tool was used to develop the multi-year AMP for the point and linear assets included in this project. The results were delivered in digital form in MS Excel format. Township staff will continue to use the applications described above to assist them in managing their infrastructure assets.

4.0 DESIRED LEVELS OF SERVICE

As described in the best practice document in the *National Guide to Sustainable Municipal Infrastructure* (2003), also known as *InfraGuide*, levels of service fall into two broad categories: those that are mandated by regulations (codes, standards, etc.); and those that result from community plans or objectives.

In general, mandated levels of service are very specific in their description of the measures to be used. This can take the form of, for example, the number of a type of bacteria per unit volume in drinking water. Community objectives tend to be less defined measurement in terms of schemes. They are future oriented, and focus less on technical measures and more on social, cultural and environmental concerns.

4.1 Mandated Levels of Service

Regulations exist to ensure the health and safety of the users of public facilities or the products delivered by a utility to the public. These regulations are enforced through codes, standards, or guidelines adopted government authorities.

The most common regulations that apply to infrastructure include:

- Minimum Maintenance Standards for Municipal Highways
- National Drinking Water Guidelines
- National Building Code of Canada
- National Fire Code of Canada

This list is not comprehensive and the owners and managers of infrastructure need to be fully familiar with the regulations that apply to their facilities.

4.2 Community Objectives

Every community has developed objectives on the expected quality of life in their community and a vision for the future. These are established either through a structured process (such as a comprehensive community plan) or by other means. The objectives and vision usually include elements of health and safety, social wellbeing, economic and cultural development, and other factors. Community objectives rely heavily on the ability of the existing infrastructure to support such plans. In many instances, the objectives call for new infrastructure that the community will have to operate and maintain for generations.

The *InfraGuide* describes the steps required to successfully establish a community's levels of service. The key elements that relate to the development of levels of service, as described in the *InfraGuide* best practice, are illustrated in ***Figure 5.***

Figure 5: Levels of Service (InfraGuide 2002)

Asset understanding refers to the knowledge about the inventory, condition and performance of infrastructure that provide the community its services: potable water, wastewater collection and treatment, solid waste management, roads and bridges, community buildings, etc. This information is provided by the AMP and is used to ensure existing and planned infrastructure can support the levels of service established.

Consultation and communication are important elements of developing community levels of service. Key stakeholders must be involved; including community leaders, operators of the assets, education and health professionals, and other levels of government officials. The consultations should be properly managed to avoid creating a "wish list", as consultations have a tendency to raise expectations amongst those involved. Instead, the consultation process should provide adequate background material, and the context and constraints (e.g., financial, environmental, material and human resources, etc.) which face the municipality. This will help generate realistic levels of services that the community can achieve and afford.

Levels of service have to be aligned to the *strategic direction* of the community. Appropriate levels of service must consider the community's ability and willingness to *tolerate risk*. The costs associated with the levels of service need to be established and evaluated in view of the capacity of the community to support them.

Ideally, each community should use this process to define their acceptable level of service. Once determined, all assets would need to be reviewed and compared to the community's expectations. Action plans on remedial measures would have to be developed to close the gap between expectations and reality, if physically and financially possible.

4.3 Determining Appropriate Levels of Service for Southwold

For this project, due to time constraint and budget limitations, a full community consultation process for establishing levels of service was not conducted. The process followed was mostly based on the *Asset Understanding* component of the process, which considered the physical and functional characteristics of an asset to define a measurable index that can be monitored over time.

Condition indices were determined as described in **Section 3.3: Condition Assessment.** The Township's current levels of service, measured in terms of condition index, were determined in consultation with the Township's project team. By combining that information with staff knowledge and current complaint records, it was possible to determine if the current levels of service provided to the residents were appropriate. Once acceptable levels of service were established, the information was used to identify current and future infrastructure investment requirements. The asset management tools described previously was provided to staff to monitor the levels of service over time, and to assess the effect of different budget scenarios on the current and future levels of service. The results of our analysis are presented in **Section 6.0: Asset Management Strategy**.

5.0 STATE OF LOCAL INFRASTRUCTURE

5.1 Estimated Current Asset Value

It is often suggested in literature that 2% to 4% of the value of an asset should be spent yearly to ensure sustainability of the assets. Without asset management tools, it is almost impossible to determine the long term effect of inadequate annual allocations. Yet, it is important for a municipality to determine if the current level of funding is appropriate to continue to provide an adequate level of service to its residents. It is also essential to allocate adequate funding to ensure sustainability of the assets in the future. For the Township, the value of the assets was estimated at just over $98 million. **Table 1** and ***Figure 6*** show the distribution of that asset value.

Table 1 – Asset Value

Infrastructure Network	Quantity	Current Replacement Cost
Sanitary Sewer	2 km	$1,015,870
Water	247 km	$19,597,324
Roads	217 km	$66,158,496
Sidewalks	8 km	$787,777
Building Facilities	23 buildings	$4,512,480
Bridges	7 structures	$3,235,837
Culverts	12 structures	$2,819,400
Streetlights	41 sections	$446,864
Recreation Equipment	15 assets	$428,134
Land Improvements	9 assets	$191,228
Total Asset Value		**$98,127,184**

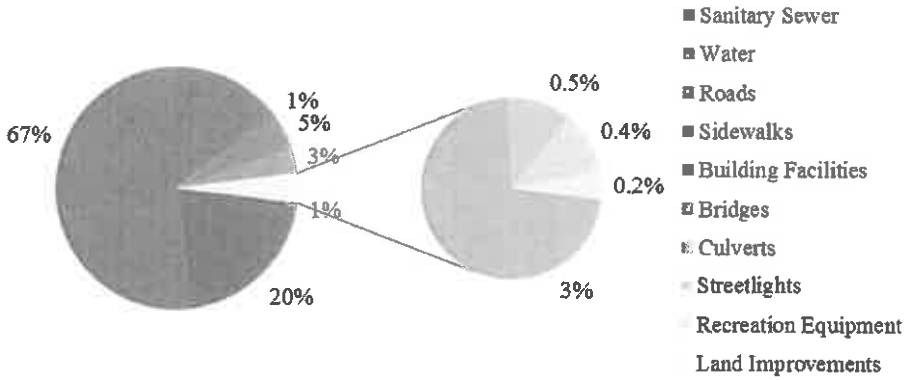

Figure 6: Total Estimated Asset Value

Based on these results and the recommended 2% yearly investment in maintenance, theoretically the Township should allocate around $1.9 million per year to ensure future sustainability of its assets.

5.2 Existing Infrastructure and Condition

The state of existing infrastructure has significant bearing on the replacement or rehabilitation profile for the assets. An average condition index was developed for each network and group of point assets, rated on a scale from 0 to 1, 1 indicating an asset in perfect condition.

5.2.1 Road Network

In analysis of the road network, the road bed was omitted as the integrity of the road bed is not likely to be compromised if the surface is kept in good condition. Township roads are made up of asphalt, chip coat and gravel road surfaces. Gravel roads within the Township are maintained on a continual basis, using an allotted operation and maintenance fund. Gravel roads were not included in the linear asset analysis; instead the yearly maintenance allotment as provided by the Township was included within the anticipated expenditure.

The road network is approximately 217 kilometers in length. Paved roads within the network, including only asphalt and chip coat surface types, make up only 70 kilometers of this length with varying widths, or approximately 32% of the network. The average year of last improvement is 2010, and the average condition index of the network, as indicated by the Township in 2013, is 0.80.

5.2.2 Watermain Network

The watermain network totals nearly 250 kilometers in length, and is relatively new with an average age of 14 years. The average condition index based on 75 year life expectancy is 0.83.

5.2.3 Sanitary Sewer Network

The sanitary sewer network has a length of approximately 2 kilometers, and was recently constructed; asset segments having an age of either 18 or 29 years only. The current condition index was determined using the age and the anticipated life expectancy of 75 years, resulting in an average value of 0.70.

5.2.4 Building and Facility Assets

A standard value of 50 years was used for the life expectancy of the buildings, as provided by the Township based on averages. Deviations from the use of this standard value are due to the completion of recent work at the building or facility, from which a life expectancy specific to the materials and work completed, could be determined. The average age of the Township building and facility assets is 27 years. The average condition index determined for the assets is 0.47.

5.2.5 Bridge and Culvert Assets

The 7 bridge structures within the Township are concrete rigid frame structures, and have an average age of 59 years. The concrete bridge life expectancy of 80 years results in an average condition index value of 0.23. The 12 culvert structures consist of both corrugated steel pipe and concrete construction, and have an average age of 39 years. Normal life expectancies for concrete culverts are 80 years, and 35 years for corrugated steel pipe. The average condition index for culverts is 0.37.

5.2.6 Sidewalk Network

The sidewalk network has a total length of approximately 8 kilometers. The network is constructed in concrete, and has an average age of 14 years. Using the normal life expectancy of 35 years, an average condition index for the network was calculated to be 0.77.

5.3 Current Needs Summary

5.3.1 Unlimited Budget Scenario

An analysis scenario assuming an unlimited annual budget is utilized to gain insight on the state of local infrastructure. Although an unlimited budget is not a reality for any municipality, the scenario demonstrates the backlog of repairs that have been neglected over the years due to a lack of funding. The results define the extent of the infrastructure needs that currently exist in the Township, indicating that a backlog exists.

The Township infrastructure is in above average condition when compared to other municipalities. Most municipalities in Canada are in a much worse situation. They are aware of the problem but are unable to properly assess the long term effect of current funding levels on the sustainability of their infrastructure. The only way for a municipality to take control and properly manage its backlog, in a realistic manner, is through the implementation of asset management tools. These tools enable asset managers to assess the long term effect of different levels of funding.

5.3.2 Current Needs Summary

Analysis was completed on the Township networks and assets to determine the current needs of the system. The threshold of acceptability used to qualify the condition of the asset was based on the experience of the project team and in consultation with staff, as discussed in **Section 3.3**. The current needs summary was completed to understand the needs within the upcoming year for the Township infrastructure.

Through the analysis, it was found that current needs are present within the paved road and sidewalk networks. No immediate needs within one year were identified with the water, sanitary sewer or gravel road networks. **Table 2** presents a summary of the current linear network needs.

Table 2 – Summary of Current Linear Network Needs

Network	Current Length	No. of Sections	% of Network in Need	Estimated Expenditure
Paved Roads	70 km	45	3%	$2,081,537
Sidewalks	7.6 km	33	1%	$9,000

Similarly, analysis was conducted for the point assets within the Township to determine current needs. Needs were identified for buildings and facilities, bridges and culverts, streetlights, and recreation equipment. **Table 3** presents a summary of the current point asset network needs.

Table 3 – Summary of Current Point Asset Needs

Asset Type	Type	No. of Facilities	Facilities in Need	% of Network in Need	Estimated Expenditure
Buildings & Facilities	Administrative	3	2	-	$594,200
	Fire Department	3	2	-	$430,200
	Public Works	5	-	-	$251,347
	Recreation	11	-	-	-
	Water	1	-	-	-
Bridges & Culverts	Bridges	7	-	-	-
	Culverts	12	6	50%	$1,181,784
Streetlights		41	6	-	$43,842
Recreation Equipment		15	9	-	$278,800
Land Improvements		9	-	-	-

Figure 7 shows the percentage breakdown of the estimated expenditures incurred in 2017.

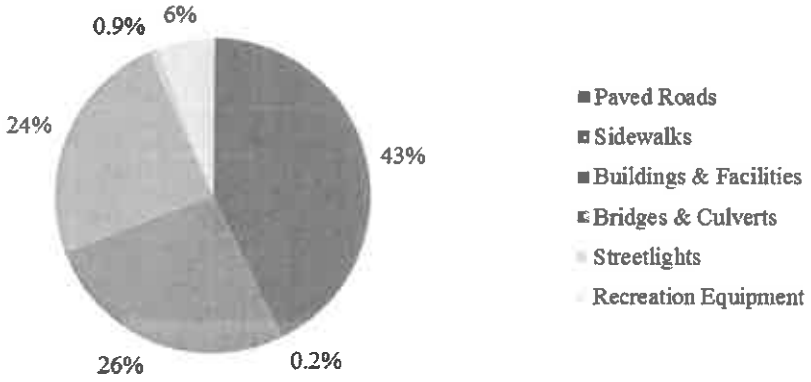

Figure 7: Estimated Percent Breakdown of Asset Repair Costs

6.0 ASSET MANAGEMENT STRATEGY

A 10 year capital plan was developed based on the condition of the infrastructure and levels of service being provided by the Township. Different annual allocations were analyzed to determine the appropriate yearly budget which would result in maintaining the current level of service offered to the residents for the next 10 years, and to analyze the impact of maintaining current allocation amounts.

Using the DPSS asset management tool described in **Section 3.4**, it is possible to analyze the effect of different budget scenarios on the linear networks. Depending on the allocated annual budget, the level of service may decrease, remain constant, or increase over time. The point assets were analyzed using the Excel-based AMP tool to develop a strategy for the 10 year timeframe.

6.1 Current Funding Level

6.1.1 Road Network

An initial value of $300,000 annually was input into the program to analyze the expenditures incurred for the road network, and its effect on the overall condition index. This allocation was determined using an approximate average for the annual capital allocation for roads, as provided by the Township during initial development of the AMP. The results in ***Figure 8*** show that maintaining the initial allocation of funding will result in a decrease in the overall network condition index.

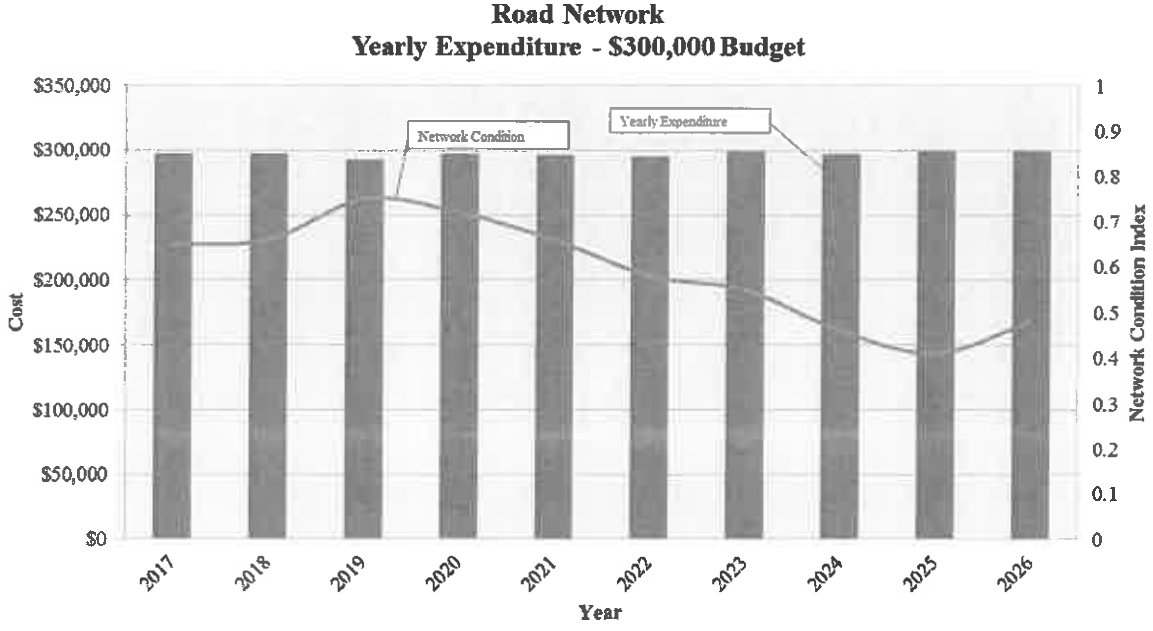

Figure 8: Road Network Performance – Initial Budget

According to this scenario, the initial allocation for funding for roads is insufficient if the Township wishes to maintain their current level of service. Based on the outcomes of the AMP analysis, the Township has opted to maintain a $600,000 annual budget for the road network.

6.1.2 Additional Infrastructure

No detailed condition assessment survey was carried out on the remaining Township networks and assets. To develop a capital program, we have used the collected data, which included information on year of construction, service lives and replacement costs. Using that information, we have approximated timing for rehabilitation and replacement of each of the remaining linear network and point asset infrastructure.

6.1.3 Water Network

The condition of the water network is such that repair is not required within a 10-year timeframe. The Municipality should not require significant expenditure to maintain these assets.

6.1.4 Sanitary Sewer Network

The condition of the sanitary sewer network is such that repair is not required within a 10-year timeframe. The Municipality should not require significant expenditure to maintain these assets.

6.1.5 Sidewalk Network

The condition of the sidewalk network is such that needs are incurred in multiple years within a 10-year timeframe. The sidewalk network was analyzed using a budget level of $52,500 annually, as defined by the Township. The results of the annual expenditure are found in **Figure 9** below.

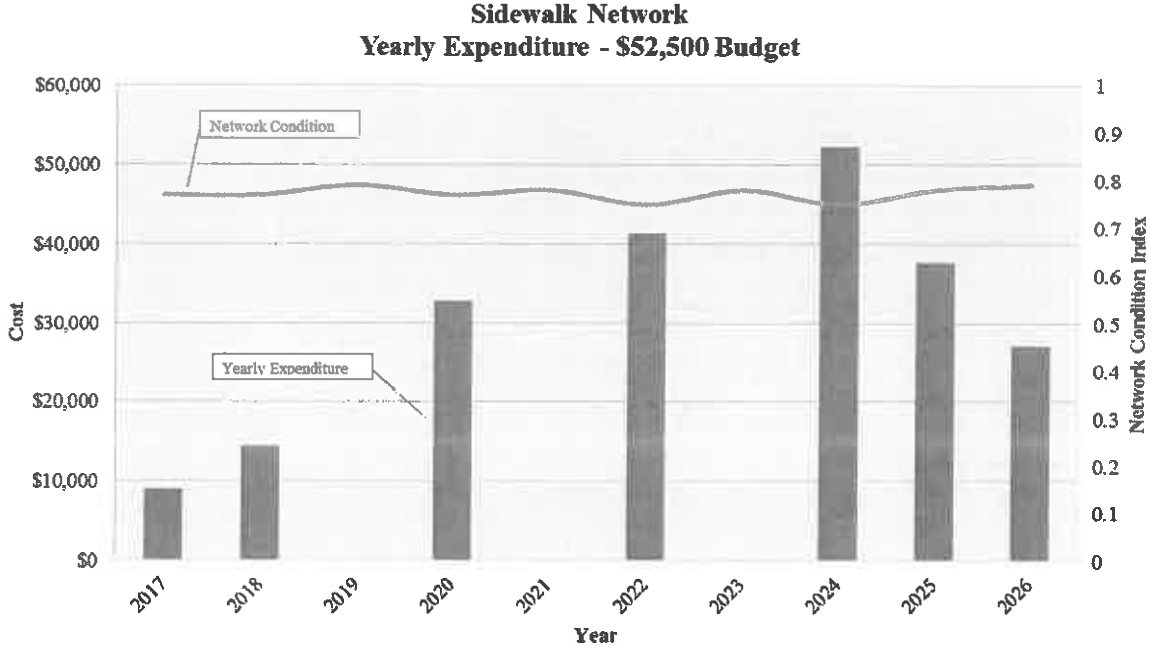

Figure 9: Sidewalk Network – Yearly Expenditure

According to the scenario, the current allocation for funding for sidewalks is sufficient to maintain the level of service.

6.1.6 Point Assets

Using the year of construction, service lives and replacement costs of the point assets, we have approximated timing for rehabilitation and replacement of those point assets and corresponding costs. The following sections illustrate the results of our analysis. Pumping stations, although point assets, did not require any rehabilitation within the analysis.

6.1.6.1 Buildings

The condition of the building assets are such that an expenditure of over $1.2 million is required in 2017 to address poor condition at six assets. It is recommended that a condition assessment of these facilities be undertaken to further refine repair or replacement needs.

6.1.6.2 Bridges and Culverts

The condition of the bridge and culvert assets is such that needs were incurred within two years. Both years of needs have large expenditures, including a $1 million expenditure in 2017, and approximately $1.4 million in 2020. It is recommended that condition assessments be undertaken for these assets to further refine repair or replacement needs. See **Figure 10** below.

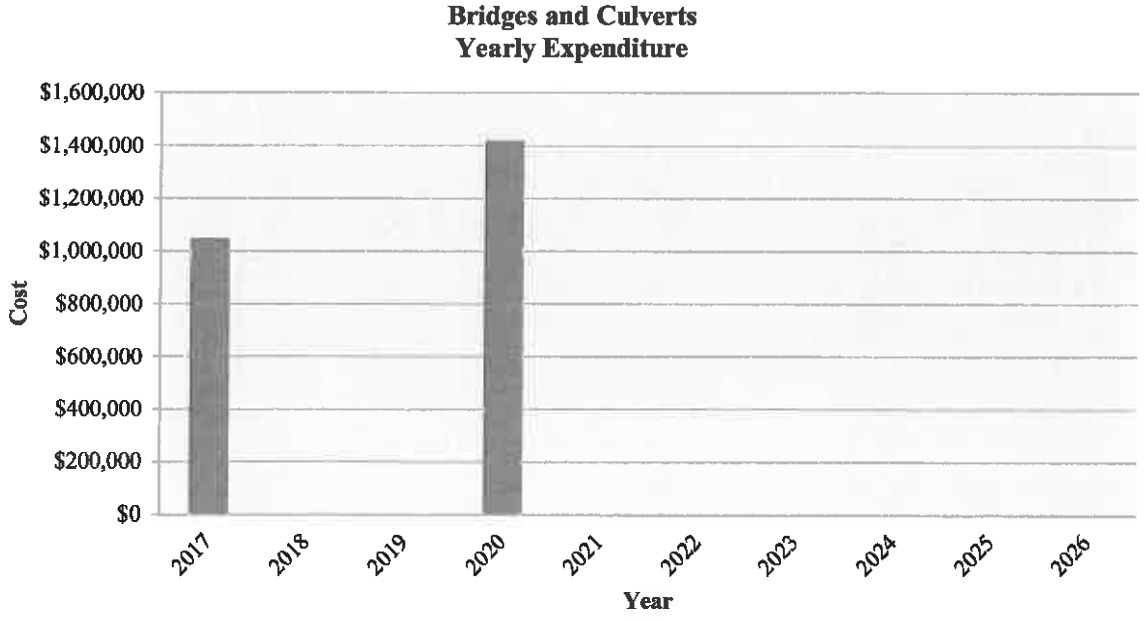

Figure 10: Bridges and Culverts - Yearly Expenditure

6.1.6.3 Streetlights

The condition of the streetlight assets is such that needs were only incurred during one year within a 10-year timeframe. Approximately $45,000 will be required for replacement of streetlight infrastructure in 2017. The Municipality should not require significant expenditure to maintain these assets.

6.1.6.4 Recreation Equipment

The conditions of the recreation equipment assets are such that needs are incurred within four years of a 10-year timeframe. **Figure 11** below illustrates the estimated expenditure. It is recommended that a condition assessment of these facilities be undertaken to further refine repair or replacement needs.

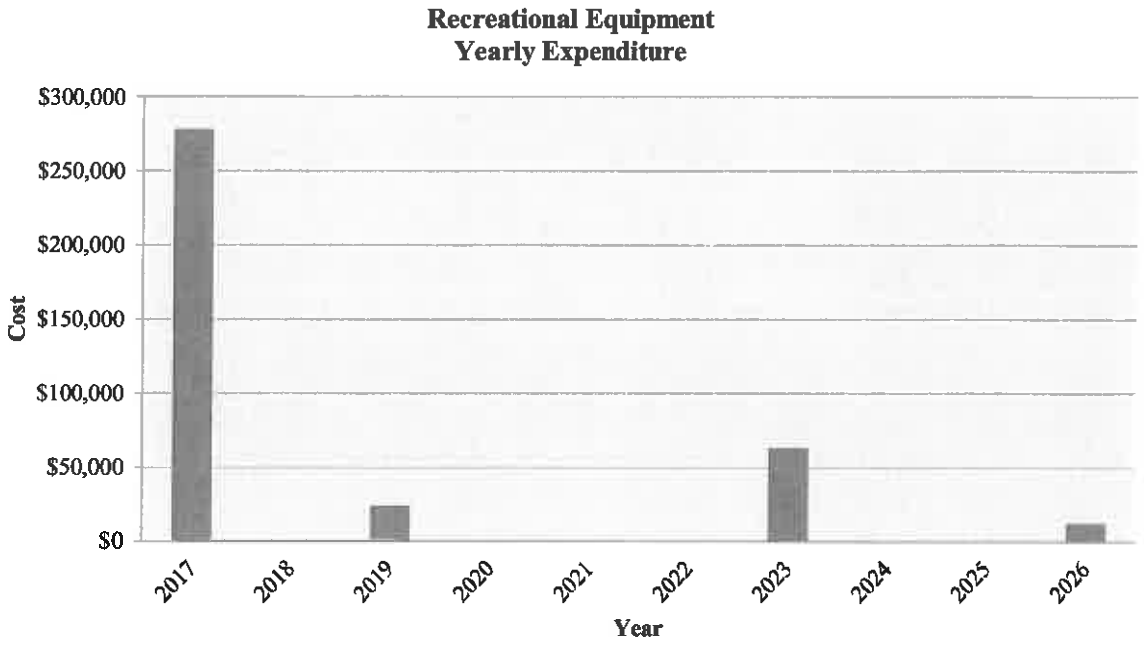

Figure 11: Recreational Equipment - Yearly Expenditure

6.1.6.5 Land Improvements

The conditions of the land improvement assets are such that needs are incurred within four years of a 10-year timeframe, including a large expenditure of over $120,000 in 2022. **Figure 12** below illustrates the estimated expenditure. It is recommended that a condition assessment of these facilities be undertaken to further refine repair or replacement needs.

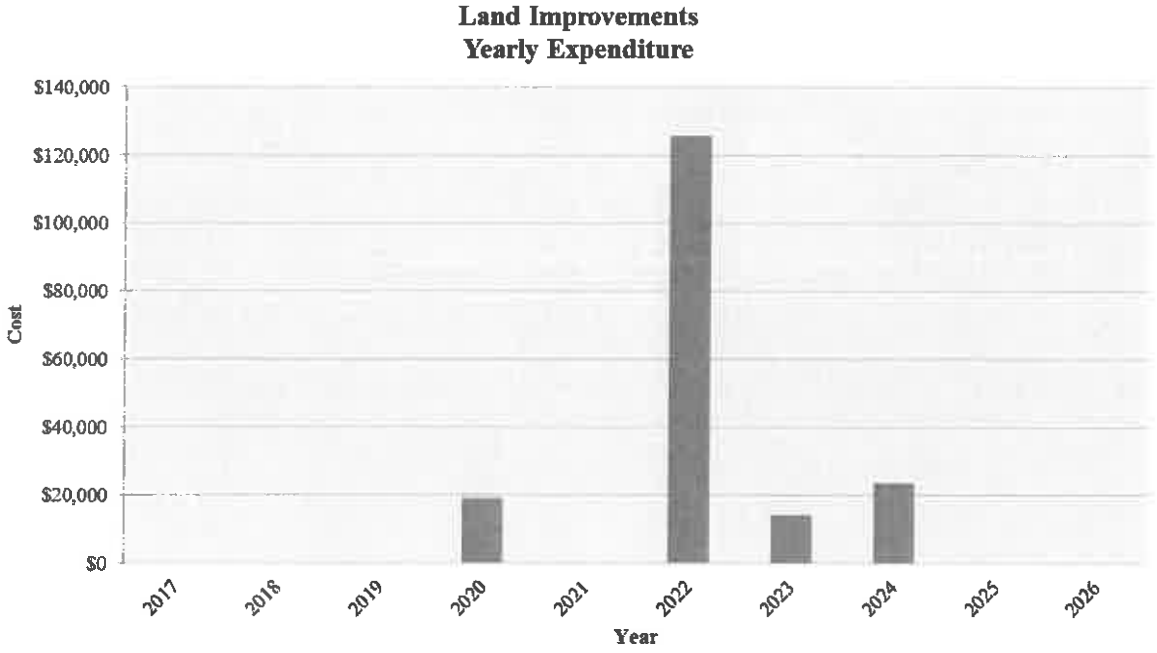

Figure 12: Land Improvements - Yearly Expenditure

A detailed list of all point assets requiring repair or replacement within the next 10 years can be found in **Appendix A.**

6.2 Maintain Level of Service

6.2.1 Road Network

To determine the level of funding required to maintain the level of service for the road network, a 10-year scenario was initially run with an unlimited budget. The results, in ***Figure 13***, demonstrated that the current level of service is high, and the costs for the first year of the plan are extensive, followed by three years where the expenditure is expected to be much less significant.

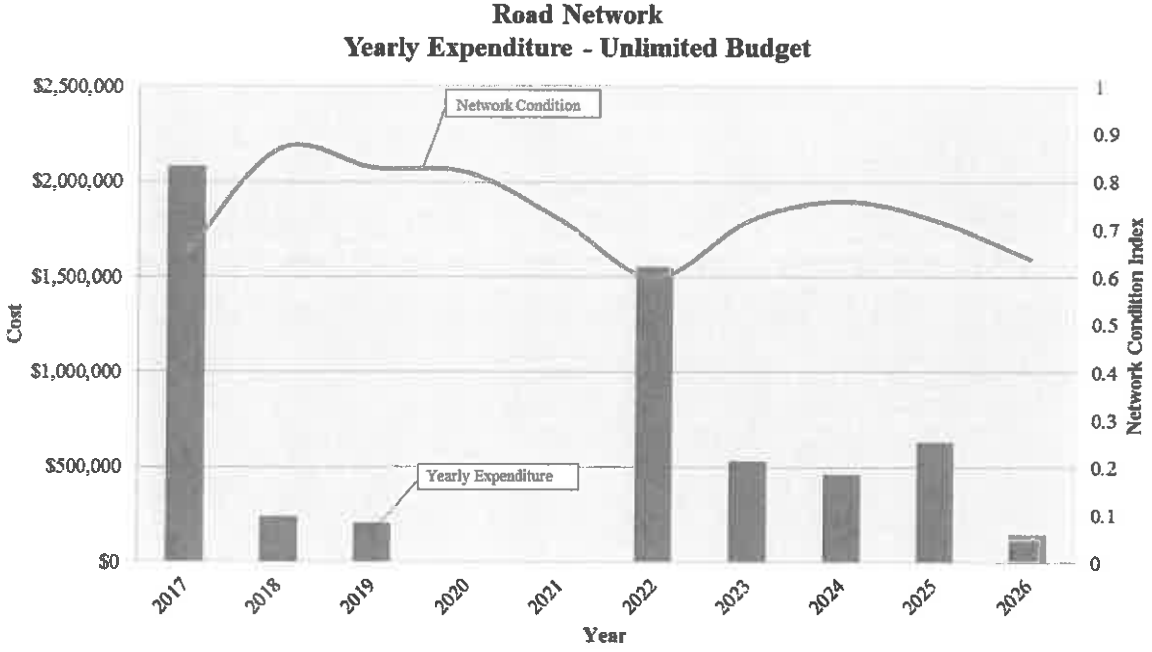

Figure 13: Road Network Performance - Unlimited Budget

The unlimited scenario shows that the road network undergoes a significant cost of rehabilitation in what appears to be a cyclical manner. The high funding requirements identified every 6 to 7 years are the results of the short service life of surface treated roads which is usually in the 7 to 10 year range. Therefore, a budget which reflects the changing magnitude of needs would suit the Township. It is also noted that the current average index of the network is high. Typically, an average index of 0.6 is considered very acceptable in the industry. The Township road network is above average, and can therefore stand to reduce funding allocation to the road network while still maintaining an acceptable level of service.

The annual allocation that would maintain the current, or typical, level of service of the road network over the next 10 years was determined. Based on our analysis, an annual allocation of $600,000 would be required to provide an adequate level of service to the residents of Southwold. This budget scenario was developed in 2013 to include an allocation of $200,000 in 2014, $400,000 in 2015, and subsequently $600,000 annually. The annual allocation was increased to $600,000 to accommodate an increase in needs on the network. The results are demonstrated below in ***Figure 14***.

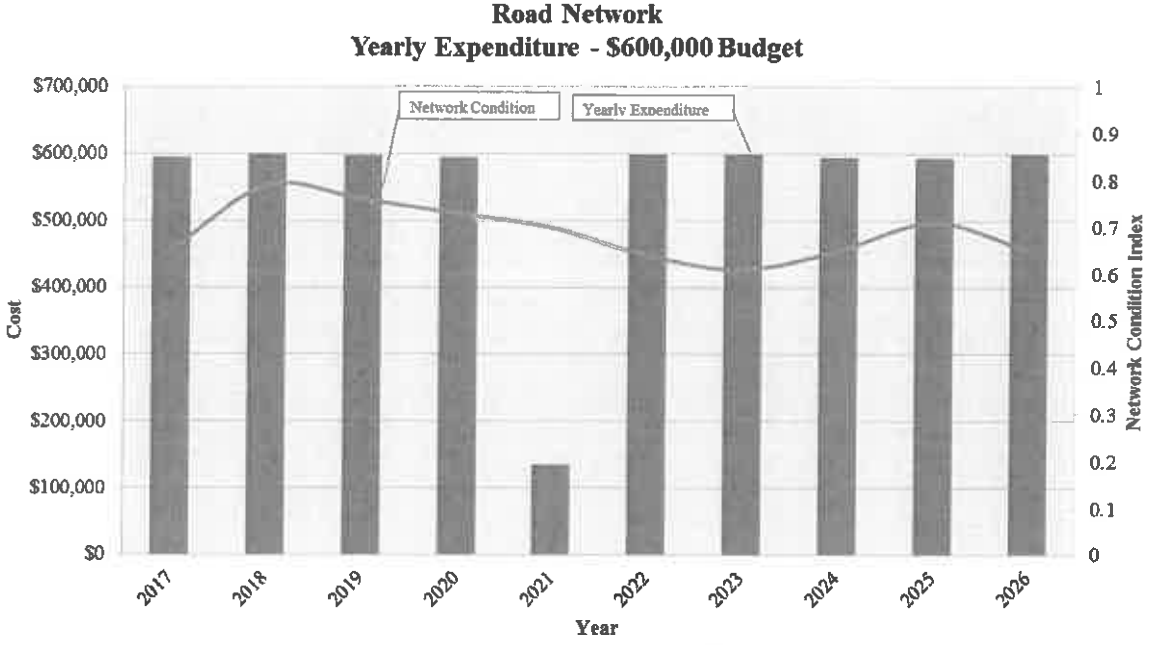

Figure 14: Road Network Performance - Budget to Maintain Level of Service

The condition index of the network fluctuates, however the average index remains at approximately 0.6 to 0.7 throughout the duration of the 10-year timeframe. A detailed list of all point assets requiring repair or replacement within the next 10 years can be found in **Appendix A.**

6.2.2 Additional Infrastructure

No detailed condition assessment survey was carried out on the remaining Township networks and assets. To develop a capital program, we have simply used the collected data, which included information on year of construction, service lives and replacement costs. Using that information, we have approximated timing for rehabilitation and replacement of each of the remaining linear network and point asset infrastructure.

The recommended actions for additional infrastructure are consistent with that presented in Section 6.1.2.

6.3 Summary

As evidenced through the results of the DPSS budget scenarios, the Township has allocated annual budget values that are sufficient to maintain a good level of service for their infrastructure. It is recommended to re-assess the road condition network on a regular basis to better assess the performance and allow better management of shortfall or network needs in the future.

6.4 Asset Management Policies

6.4.1 Approach to Data Assembly

The Township currently manages a large amount of data and information stored in digital databases. It is recommended to incorporate additional information related to all other assets and create what is referred to as an enterprise database. This is critical for on-going infrastructure management activities within the Township's organization. The database used in preparation of the AMP encompasses asset information that can support multiple business functions. ***Figure 15*** and ***Figure 16*** illustrate the concept of going from an ad-hoc data environment to a structured enterprise database.

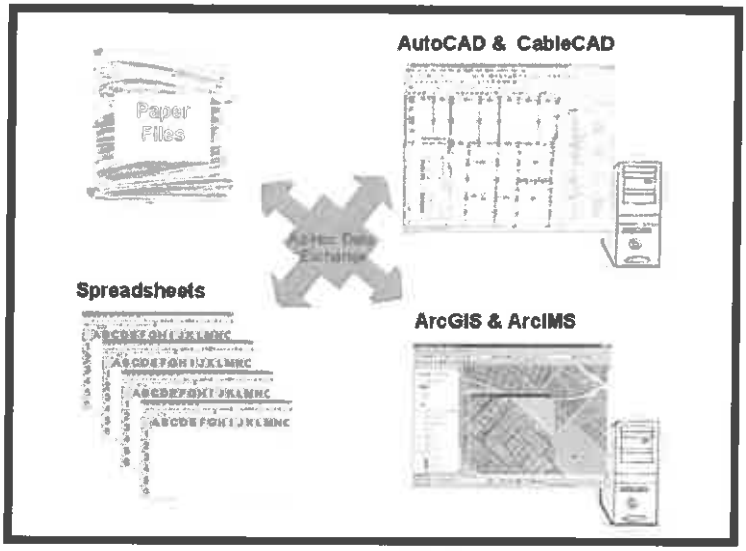

Figure 15: Ad Hoc Environment

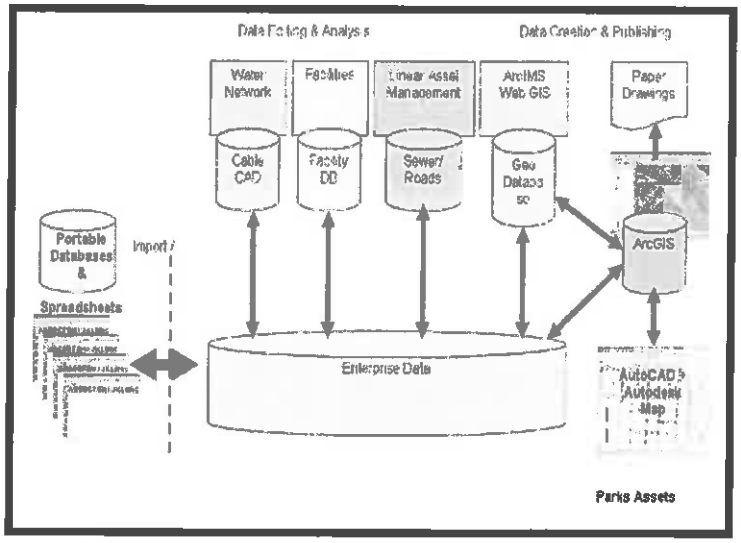

Figure 16: Recommended "Enterprise" Environment

The recommendation to use the Corporate GIS as the enterprise database is common practice in many municipalities across Canada. Data is maintained in one environment, and accessible by many users.

Relevant information can be exported in external applications for processing of data. The results can then be imported back in the GIS database and accessed/displayed graphically which add value to the information stored in databases. An enterprise database system reduces data redundancy and increases access to information across the organization.

6.4.2 Condition Assessment Strategy

In continuing to maintain a detailed AMP over time, it is highly recommended that the Township acquire detailed condition assessment data on all components of their infrastructure assets. It is critical to ensure the data is current and accurate, in order to maintain a useful AMP.

Roads should undergo a full condition assessment every 3-5 years. Given the shorter lifespan of road structures, and high variability in road construction and environment, pavement condition indices are more difficult to estimate over time. Therefore, their condition should be evaluated on a more frequent basis.

Underground pipe assets historically undergo far fewer condition assessments. A sampling approach for collecting condition data and extrapolating the results to assets with similar physical and operational characteristics is a viable option when funding is limited. For example, in this approach Closed Circuit Television (CCTV) inspection survey might be conducted for a sample of pipes, and results can be extrapolated to pipes with similar physical characteristics. This approach is commonly used for long term financial planning. Another approach is to use the results of the replacement profile developed using the AMP tool to identify pipes that are, or could be, in need of rehabilitation now or in the next few years, and generate a CCTV program to only investigate these critical pipes. This approach is very commonly used when funding is limited.

The approach for condition assessment of point assets is different except for bridge and culvert structures which are mandated to be inspected every 2 years. Components of buildings such as roof, HVAC system, and electrical components usually all have different service lives. It is recommended to have one complete inspection of all facilities and to replace or monitor the components that have been identified as requiring attention now or in the future. This overall detailed inspection could be carried out every 7 to 10 years but asset management tools should be used to frequently visit and monitor assets that are approaching the end of their service lives.

6.4.3 Maintenance Activities

It should be understood that most infrastructure assets will usually reach their expected service lives if routine maintenance is carried out on those assets while in service. As specified in the literature, and noted in Section 5.1, 2% to 4% of the value of an asset should be spent on a yearly basis to ensure it reaches the end of its service life. Most municipalities will spend less than 2% a year of the value of the asset in maintenance. Maintenance activities such as crack sealing or slurry sealing a roadway or flushing and cleaning a sewer pipe should be carried out on a regular basis depending on the condition and age of the assets. There are many very good Computerized Maintenance Management Systems (CMMS) in the market that are very helpful and efficient in ensuring sustainability of infrastructure assets. Some types of CMMS could be very beneficial to the Township.

6.4.4 Integrated Rehabilitation

In order to make cost-effective decisions with regard to rehabilitation of infrastructure assets, it is recommended (as suggested in the Asset Management Best Practice published by the *Infraguide*), that an integrated approach be used to acknowledge the close proximity and high level of interaction between the infrastructure networks. Knowledge of the integrated condition of these networks provides a clear advantage to municipal administrators by giving a global view of the infrastructure networks.

The spatial proximity consideration of that approach allows for a more accurate set of interventions by using the concept of "windows of opportunity". This enables analysis of assets, not only based on actual condition, but also on a predictive condition in time. This is made possible by defining windows of opportunity along the deterioration curves, as shown on ***Figure 17***.

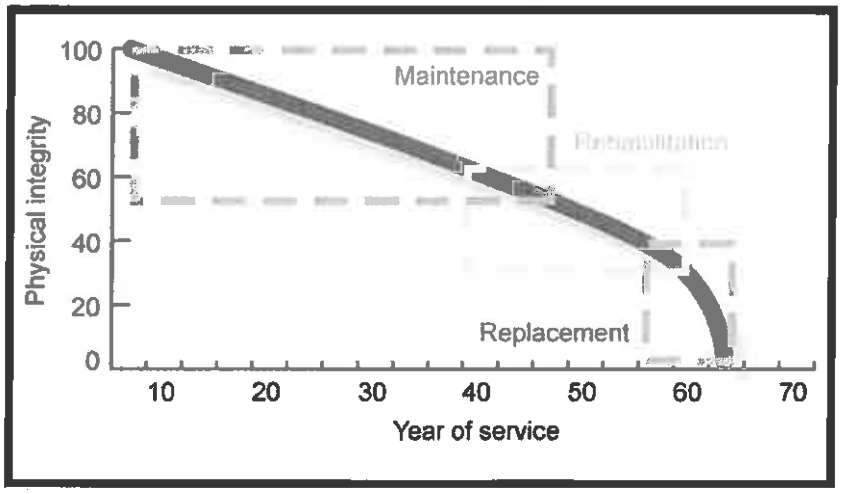

Figure 17: Windows of Opportunity

This approach relates to economics and cost-effectiveness. Priority is assigned by reviewing all locations in the network identified for repair and assigning a higher priority to locations where more than one component of the asset network requires rehabilitation. This approach provides for a reduction in replacement costs per meter of a pipe by carrying out the repair of more than one pipe within the same excavation. The "window" concept allows delaying a rehabilitation activity as long as it stays within that window, to combine it with another piece of infrastructure in the vicinity of the pipe.

6.5 AMP Update and Evaluation

The present AMP has been designed for a time span of 10 years. However, as previously mentioned it should be treated as a living document, which is regularly updated to reflect changes in infrastructure condition. It is, therefore, recommended that the AMP be updated every year. This will include incorporating rehabilitations and their associated condition changes, adding newly constructed infrastructure, removing decommissioned infrastructure from the analysis, and updating unit prices for rehabilitation or reconstruction.

The AMP should also be continuously evaluated and improved through clearly defined actions. It is recommended that the Township generate short-term action plan every 2 to 3 years including a timetable for implementation. These actions should include measures to insure data quality, and improve the AMP process.

6.6 Criticality of Infrastructure and Risk

The criticality of infrastructure and consequences of failure of that infrastructure were not really addressed in this project. However some general guidelines could be provided to assess criticality and identify high level consequences of failure. The results of this high level assessment should be used to assigned priorities to infrastructure repair and minimize disruption to the general public. Some criteria that should be looked at when assigning priorities could be:

1. Road classification: Rural and urban roadways carry differing traffic loads, and defects on higher load roads should be addressed first.
2. Pipe sizes: Large pipes service more people than local small pipes therefore should be prioritized for repair or replacement when identified as network need.
3. Bridge access to a community: In some cases, a municipality may only have one or two accesses that are serviced by a bridge structure. These should be fixed first when defects are identified.

These are examples of common sense factors that should be used to define criticality and assign a risk factor. But if a community decides to conduct a detailed study to identify Critical Assets and Risk associated with them, they should think of using the following framework that was developed by individuals from Australia and New Zealand:

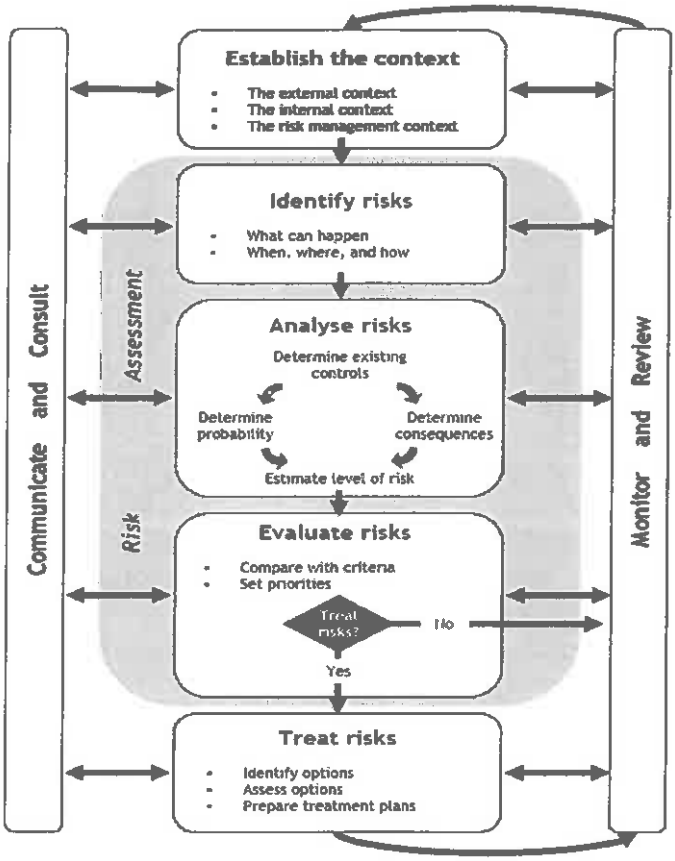

Figure 18: Framework for Identification of Critical Assets

Source: Australian and New Zealand AS/NZS 4360 (1999) '*Risk Management*' and Emergency Management Ontario (2004) '*Emergency Management Doctrine for Ontario*.'

By following this approach, the municipality would have a much better understanding of its infrastructure assets and be in much better position to prioritize repair or replacement of critical assets.

7.0 FINANCING STRATEGY

Financing infrastructure needs has become a very serious issue. We need to identify better practices and innovations in infrastructure financing if municipalities and other levels of government want to continue to provide an adequate level of service to tax payers in an affordable manner. It seems to make sense that municipal infrastructure should be financed, as far as possible, by the residents who benefit from it but, how do you determine who should pay for the rehabilitation of an arterial or collector road going from point A to point B in large cities throughout Canada. In addition, for the past many years, municipal accounting practices have failed to include replacement costs for depreciating assets, thereby assuring a fiscal shock when replacement time arrives. The Public Sector Accounting Board (PSAB) has changed that practice, which has made municipalities realize the extent and magnitude of the infrastructure deficit. Asset managers need to come up with innovative solutions to address that infrastructure deficit.
Asset management systems are part of the solutions but innovative financing and finding alternate revenue sources are an even bigger part of the solution.

Most municipalities are familiar with a variety of internal and some external revenue sources. The following describes a few of those revenue sources currently used by municipalities:

- **Internal Revenue Sources**
    - ***General Operating Revenues***. Rural municipalities, towns and smaller cities tend to rely more on local taxes, user fees and grants than on borrowing, partly because borrowers view them as higher risk than larger cities, thus raising their borrowing costs.
    - ***Earmarked User Fees***. An earmarked user fee is dedicated to a specific project; for example, water and sewer charges for water infrastructure, disposal fees for solid waste facilities, and admission charges for recreational complexes.
    - ***Reserves***. Financing capital projects through funds set aside for capital spending is the reverse of financing through borrowing. A "capital levy" (usually a few percentage points of the local property tax) is set aside and accumulates in interest earning accounts segregated from general revenues.
    - ***Special Assessments and Local Improvement Charges***. A special assessment is a specific charge added to the existing property tax to pay for improved capital facilities that border them. The charge is based on a specific capital expenditure in a particular year, but may be spread over a number of years.
    - ***Development Charges***. Most large municipalities and many smaller ones impose a specific dollar value per lot on developers to finance the off-site capital costs of new development. Developers are generally responsible for on-site services, such as local roads, sidewalks, and street lighting. Historically, development charges have financed "hard" services, such as water supply, sewage treatment, trunk mains and roads.

- **External Revenue Sources**
    - ***Grants***. Although municipal reliance on provincial and federal government grants for infrastructure has declined over the past 15 years in most provinces, capital assistance is available for water, sewer, and transportation projects with all three levels of government participating (Kitchen and Slack 2003). The most recent and widely discussed grant is from the five-cent-per-litre federal gas tax transfer. Conditional transfers require municipalities to spend according to the guidelines of senior governments and often require matching funds on the part of the recipient municipality.
    - ***Borrowing:*** Municipalities engage in both short-term and long-term borrowing. Short-term borrowing may be used to finance capital expenditures or to finance an unexpected deficit in the operating budget — municipalities in Canada do not have the authority under provincial legislation to budget for an operating deficit. Long-term borrowing is restricted to financing capital expenditures. For infrastructure whose benefits accrue to future residents, fairness, efficiency and accountability is enhanced if these projects are financed by borrowing with repayment coming from property tax revenues and user fees paid by future beneficiaries.

- **New Financing Instruments**
    - ***A Dedicated Municipal Fuel Tax***: Many American cities levy fuel taxes, but municipalities in Canada do not. In a few Canadian cities and city-regions (Victoria, Vancouver, Edmonton, Calgary, and Montreal), provincial fuel tax revenues are shared between the province and the city or city-region. The federal government's recent initiative to provide grants to municipalities from federal gas tax revenue is a form of revenue sharing and not a municipal fuel tax because the municipalities do not set fuel tax rates and have no say over the tax base.
    - ***Public-Private Partnerships (P3):*** A P3 involves the direct participation of the private sector in a venture controlled by the public sector. The public sector's role is to facilitate, regulate, and guarantee provision of an asset and the private sector's role is to design, finance, build and operate the asset in a formalized partnership agreement.

There are also a few new financing instruments that have been made available to municipalities. The federal government's initiative to provide grants to municipalities from federal gas tax revenue is one example of a new financing instrument. The Public-Private Partnership (P3) is also a new financing instrument that may be considered by municipalities. It involves the direct participation of the private sector in a venture controlled by the public sector. The public sector's role is to facilitate, regulate, and guarantee provision of an asset and the private sector's role is to design, finance, build and operate the asset in a formalized partnership agreement.

7.1 Township of Southwold Financing Strategy

In **Section 6.0** of this report we have worked with Township staff to develop an Asset Management (AM) Strategy, including funding requirements that would ensure sustainability of the assets to continue to provide an adequate level of service to the residents of Southwold. The strategy developed is realistic and affordable. The Township has identified a source which will support the Asset Management Plan (AMP) developed through this report. The primary funding source in the Township is reserves, supplemented periodically by federal or provincial funding.

These financing sources will address a significant portion of the infrastructure needs identified in this report but additional external financing may be required to ensure sustainability of the assets to continue to provide an adequate level of service to the residents of the Township in the future.

Prior to the production of the initial Asset Management Plan in 2013, the Township had developed a predefined capital budget for 2014. The budget included dollar values attributed to capital projects for the sidewalk, water, sanitary sewer and road networks.

Updated capital budget values were developed for the 2016 AMP update (Revision 1). The Township provided budget values for 2017-2019 for some networks: roads (including road works, sidewalks, streetlights, bridges and culverts), playground equipment, buildings and facilities. Budget values were null for sanitary sewers, and budget values for water were based on inflation of the initial budget values provided in 2013. The subsequent values, for years 2020-2026 were determined through a rate of 3% inflation, consistent with inflation values used to determine replacement costs for the assets. Capital budget projections are included in **Table 4**.

Table 4 – 2017 Capital Budget Allotments and Future Projections

Year	Roads	Water	Sidewalks	Buildings & Facilities	Bridges & Culverts	Streetlights	Recreation Equipment
2017	$600,000	$13,200	$ -	$60,000	$100,000	$10,000	$8,000
2018	$618,000	$13,600	$25,000	$80,000	125,000	$10,000	$8,000
2019	$636,600	$14,000	$25,000	$125,000	125,000	$20,000	$8,000
2020	$655,700	$14,400	$25,800	$128,800	128,800	$20,600	$8,300
2021	$675,400	$14,800	$26,600	$132,700	132,700	$21,300	$8,500
2022	$695,600	$15,300	$27,400	$136,600	136,600	$21,900	$8,800
2023	$716,500	$15,700	$28,200	$140,700	140,700	$22,600	$9,100
2024	$738,000	$16,200	$29,000	$145,000	145,000	$23,200	$9,300
2025	$760,100	$16,700	$29,900	$149,300	149,300	$23,900	$9,600
2026	$782,900	$17,200	$30,800	$153,800	153,800	$24,600	$9,900

Notes
- Blue indicates values provided by the Township. All others are inflated based on 3% annually.
- Buildings & Facilities: 2017-19 are sums of the 'Building Renewal Reserve' values within the Contributions chart.
- Water: Budget levels carried over based on projection from initial 2013 value.
- Recreation Equipment: Value represents Playground Equipment reserve.

Reserve details for other networks for year-end 2016 were also provided, and are shown in **Table 5**.

Table 5 – Capital Reserve Balances at the End of 2016

Year	Roads
Road Building Renewal	$155,000
Road infrastructure	$699,431
Bridges	$135,059
Sidewalks	$ -
Street Lights	$111,240
Medical Centre Building	$70,000
Playground Equipment	$51,974
Keystone Complex Building	$46,221
Library Building	$63,787
Water Reserve	$5,896,779
Sewer Reserve	$202,361

The values attributed were compared with those determined within Section 6.0 of this report, for identification in monetary differences between money allotted and anticipated expenditures.

7.1.1 Road Network

The Township has currently allotted $600,000 in 2017 to address capital works for the road network. This value included capital costs for paved road works, excluding construction projects, equipment costs and gravel road resurfacing. Considering inflation, this amount will be required to augment to $783,000 over the 10 year period. Analysis was done on the road network using a $600,000 annual allocation. It was found that this budget was sufficient to maintain the level of service of the road network, however the average condition index trended downward toward the end of a ten-year period. It is recommended then that the entirety of the budget be used annually for road rehabilitation and any surplus budget each year to be used in future when requirements are greater than current budget.

7.1.2 Water Network

Based on inflation of the initial budget provided in 2013, the Township has an allotment of $13,200 in 2017 to address capital works for the water network. Considering inflation, this amount will be required to augment to $17,200 over the 10 year period. Through analysis, it was identified that there are no anticipated expenditures within a 10 year timeframe. No expenditures were identified in analysis for the 10 year period, and it is therefore recommended that funds be allocated into reserves in anticipation of future requirements.

7.1.3 Sanitary Sewer Network

The Township has currently allotted a null capital budget in 2017 for the sanitary sewer network. The network is in generally good condition, and through analysis no expenditures were identified for the 10 year period. It is recommended that funds be allocated into reserves in anticipation of future requirements.

7.1.4 Sidewalk Network

The Township has currently allotted a null capital budget in 2017 to address capital works for the sidewalk network, however has allotted $25,000 in both 2018 and 2019. Considering inflation, this amount will be required to augment to $30,700 over the 10 year period. Expenditures were identified in most years for the 10-year period, when analyzed with a $52,500 annual budget. Based on the results of the analysis, the current annual budget is insufficient to maintain the high level of service. It is recommended that this budget allocation be increased in future years to meet upcoming demands.

7.1.5 Building and Facility Assets

The Township has currently allotted $60,000 in 2017, $80,000 in 2018, and $125,000 in 2019 to address building and facility capital works, based on reserve fund values for building renewal (categorized under general, fire, health services, keystone complex and library). These funds are anticipated to be obtained using reserves, donations, and long term funding as financial resources. The analysis results shown in **Section 6.1.6** demonstrate a discrepancy between what has been allocated and that which is anticipated in the 10 year timeframe. In future, budgeting $350,000 annually should be reasonable to address the concerns, and undertaking detailed condition assessment to prioritize the recommended works. This budget represents a value consistent with that recommended in the initial AMP. The sources of the funding were identified as being through previous financial commitments from a third party, anticipated long-term debt, and donations. We suggest following these strategies for all of the other construction projects. The Township also accepts donations to be put towards their assets.

7.1.6 Bridge and Culvert Assets

The Township has currently identified $100,000 in 2017 and $125,000 in both 2018 and 2019 as a budget value to address bridge and culvert assets. Through the analysis undertaken, two years were identified with bridge and culvert expenditures, totalling $1.2M in 2017, and $1.6M in 2020. Insufficient budget has been allocated to address bridge and culvert needs within a 10 year timeframe.

7.1.7 Streetlights

The Township has currently identified a budget of $10,000 in both 2017 and 2018, and $20,000 in 2019 to address deficiencies within the streetlight assets. Through the analysis undertaken, one year of works was identified for the streetlight infrastructure, totaling $45,000 in 2017. Based on the results of the analysis, the budget is sufficient to address the identified costs, over a span of 4 years.

7.1.8 Recreation Equipment

The Township has currently allotted a budget of $8,000 annually between 2017-2020 to address capital works for recreation equipment. This allotment has been identified specifically for playground equipment. During analysis of the network, it was identified that needs are incurred within four years of a 10-year timeframe, the initial expenditure anticipated to be greater than $250,000. Insufficient budget has been allocated to address recreation equipment needs within a 10 year timeframe.

7.1.9 Land Improvements

The land improvements do not currently have a designated budget. Expenditures are anticipated to be required within 4 years for these assets. These expenditures range from just over $14,000 in 2023 to $125,000 in 2022, and are anticipated to be nearly $200,000 in total over the years considered. Insufficient allocations have currently been made to address these needs, and it is recommended that budget be identified going forward.

8.0 REFERENCES

Canadian Federation of Municipalities. (2012). *Canadian Infrastructure Report Card*. Volume 1. <http://www.canadainfrastructure.ca/downloads/Canadian_Infrastructure_Report_Card_EN.pdf>

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Ministry of Infrastructure of Ontario. (2012). *Building Together: Guide for Municipal Asset Management Plans*. *http://www.moi.gov.on.ca/pdf/en/Municipal%20Strategy_English_Web.pdf*

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APPENDIX A

10-Year Program for Lineal and Point Asset

Intervention Year	ID	Street	From Street	To Street	Estimated Cost
2017	260, 60.2B	Lynhurst Park Drive	Lynhurst Park Drive	Lynhurst Park Drive	$69,960.00
2017	115	Bush Line	Mill Road	John Wise Line	$65,193.00
2017	26	Parson Road	Fourth Line	Southminster Street	$63,240.00
2017	27	Parson Road	Fourth Line	Longhurst Line	$38,440.00
2017	77	Lyle Road	North of Tracks		$31,200.00
2017	129	Bush Line	Lyle Road	Relger Road	$23,696.40
2017	112B	Bush Line	Ashmore Road	760 M NE of Ashmore Road	$23,653.00
2017	112A	Bush Line	Oneida Road	Ashmore Road	$20,739.00
2017	467, 65.8	Glasgow Street	Fingal Line	Union Road	$20,160.00
2017	470, 65.7	Inverness Street	Lanark Street	Fingal Line	$19,620.00
2017	112C	Bush Line	760 M NE of Ashmore Road	Mill Road	$19,437.00
2017	471, 65.5	Argyle Street	Lanark Street	Fingal Line	$18,630.00
2017	469, 65.6A	Lanark Street	Union Road	Inverness Street	$18,000.00
2017	466, 65.1D	Millpark Street	Fowler Street	Fingal Line	$15,120.00
2017	465, 65.11	Church Street	Fingal Line	Fowler Street	$13,590.00
2017	100	Roberts Line	Sparta Line	Town Limit	$11,475.00
2017	47B	Longhurst Line	Paynes Mills Road	Parson Road	$11,095.00
2017	260, 60.2C	Lynhurst Park Drive	Lynhurst Court	Wellington Road	$10,440.00
2017	474, 65.3	St James Street	Centre Street	End	$9,360.00
2017	472, 65.1B	Centre Street	Spring Street	James Street	$9,000.00
2017	469, 65.6B	Lanark Street	Inverness Street	Argyle Street	$9,000.00
2017	472, 65.1D	Centre Street	Fingal Line	Queen Street	$8,910.00
2017	260, 60.2A	Lynhurst Park Drive	Lynhurst Park Drive	Lynhurst Park Drive	$8,640.00
2017	472, 65.1A	Centre Street	James Street	Queen Street	$8,550.00
2017	466, 65.1B	Millpark Street	83 M NW of Fowler Street	171 M NW of Fowler Street	$7,920.00
2017	472, 65.1E	Centre Street	Spring Street	85 SE of Spring Street	$7,650.00
2017	261, 60.1	Lyn Court	Lynhurst Park Drive	End	$7,560.00
2017	466, 65.1A	Millpark Street	Fowler Street	83 M NW of Fowler Street	$7,470.00
2017	475, 65.2	Spring Street	Centre Street	End	$7,470.00
2017	472, 65.1C	Centre Street	85 M SE of Spring Street	End	$3,330.00
2017	466, 65.1C	Millpark Street	171 M NW of Fowler Street	End	$3,150.00
2017	28B	Gore Fifth Line	Lawrence Road	Lawrence Road	$3,000.00
2018	29A	Gore Fifth Line	Lawrence Road	Stafford Line	$363,240.00
2018	96	Lake Line	Scotch Line	Union Road	$112,162.50
2018	29B	Gore Fifth Line	Stafford Line	Union Road	$72,120.00
2018	47A	Longhurst Line	Parson Road	Woodplant Road	$52,290.00
2019	28A	Gore Fifth Line	Iona Road	Lawrence Road	$361,680.00
2019	54	Shorlea Line	Wonderland Road	Wellington Road	$86,663.00
2019	90	Scotch Line	Boxall Road	Coon Road	$85,986.00
2019	44	Longhurst Line	John Wise Line	Paynes Mills Road	$44,835.00
2019	658, 132.4A	Major Line	North Street	McBain Line	$8,280.00
2019	53B	Wonderland Road	Southminster Bourne	Ferguson Line	$7,767.20
2019	55A	Talbotville Gore Road	Talbotville Gore Road	Sunset Road	$2,932.50
2020	56	Talbotville Gore Road	Shady Lane Cres	Sunset Road	$123,675.00
2020	95	Scotch Line	Coon Road	Lake Line	$81,260.00
2020	45	Paynes Mills Road	Longhurst Line	Talbot Line	$77,976.00
2020	55B	Talbotville Gore Road	113 M SE of Sunset Road	Shady Lane Cres	$75,480.00
2020	42	Longhurst Line	Mill Road	John Wise Line	$74,480.00
2020	53A	Wonderland Road	Ferguson Line	Clinton Line	$66,378.90
2020	55C	Talbotville Gore Road	Shady Lane Cres	Shady Lane Cres	$35,445.00
2020	RS6, 132.1A	Florence Street	Major Line	End	$30,720.00
2020	658, 132.4B	Major Line	Florence Street	North Street	$29,160.00
2021	173	McBain Line			$30,660.00
2021	RS5, 132.2	James Street	Florence Street	North Street	$18,960.00
2021	RS4, 132.3B	North Street	Florence Street	James Street	$18,840.00
2021	RS6, 132.1B	Florence Street	North Street	James Street	$18,360.00
2021	RS4, 132.3C	North Street	Florence Street	End	$11,400.00
2021	RS4, 132.3A	North Street	James Street	Major Line	$10,560.00
2021	RS6, 132.1C	Florence Street	James Street	Major Line	$10,200.00

Intervention Year	ID	Street	From Street	To Street	Estimated Cost
2021	658, 132.4C	Major Line	Ford Road	Florence Street	$8,160.00
2021	473, 65.4	Victoria Street	Centre Street	End	$7,560.00
2022	74A	Ford Road	McBain Line	Talbot Line	$181,681.50
2022	260, 60.2B	Lynhurst Park Drive	Lynhurst Park Drive	Lynhurst Park Drive	$69,960.00
2022	115	Bush Line	Mill Road	John Wise Line	$65,193.00
2022	74D	Ford Road	34 M W of Wellington	Major Line	$58,285.50
2022	74C	Ford Road	Major Line	McBain Line	$54,463.50
2022	27	Parson Road	Fourth Line	Longhurst Line	$38,440.00
2022	129	Bush Line	Lyle Road	Reiger Road	$23,696.40
2022	112B	Bush Line	Ashmore Road	760 M NE of Ashmore Road	$23,653.00
2022	112A	Bush Line	Oneida Road	Ashmore Road	$20,739.00
2022	112C	Bush Line	760 M NE of Ashmore Road	Mill Road	$19,437.00
2022	260, 60.2C	Lynhurst Park Drive	Lynhurst Court	Wellington Road	$10,440.00
2022	260, 60.2A	Lynhurst Park Drive	Lynhurst Park Drive	Lynhurst Park Drive	$8,640.00
2022	261, 60.1	Lyn Court	Lynhurst Park Drive	End	$7,560.00
2022	unopened	Ford Road	Major Line	Wellington Road	$5,869.50
2022	74B	Ford Road	Wellington Road	34 M W of Wellington	$4,641.00
2022	472, 65.1C	Centre Street	85 M SE of Spring Street	End	$3,330.00
2022	466, 65.1C	Millpark Street	171 M NW of Fowler Street	End	$3,150.00
2023	119	Fulton Bridge Line	Middle River Road	Mellor Road	$75,390.00
2023	26	Parson Road	Fourth Line	Southminster Street	$63,240.00
2023	250, 138C	Shady Lane Crescent	Greenpark Road	Greenpark Road	$59,400.00
2023	268, 66.12	Francis Street	Talbot Line	Elizabeth Street	$49,560.00
2023	250, 138A	Shady Lane Crescent	Greenpark Road	Talbotville Gore Road	$40,905.00
2023	270, 271, 66.9A	John Street N	Rose Ave	Courtney Street	$31,500.00
2023	251, 139	Greenpark Drive	Shady Lane Cres	Shady Lane Cres	$30,375.00
2023	250, 138B	Shady Lane Crescent	Greenpark Road	Talbotville Gore Road	$29,970.00
2023	120A	Mellor Road	Fulton Bridge Line	End	$27,055.00
2023	270, 271, 66.4D	John Street	Orchard Street	Talbot Line	$16,905.00
2023	275, 66.5B	Orchard Street	John Street	End	$15,330.00
2023	266, 66.2B	Horton Street	Hall Street	End	$12,600.00
2023	269, 66.8A	Elizabeth Street	Francis Street	Union Road	$11,130.00
2023	266, 66.2A	Horton Street	Hall Street	Union Road	$10,920.00
2023	270, 271, 66.4E	John Street	Waugh Street	Talbot Line	$10,710.00
2023	270, 271, 66.4B	John Street	George Street	Brook Street	$10,605.00
2023	267, 66.1	Hall Street	Talbot Line	Horton Street	$10,605.00
2023	276, 66.6	Brook Street	John Street	End	$10,530.00
2023	274, 66.3	Waugh Street	Union Road	John Street	$10,500.00
2023	275, 66.5A	Orchard Street	Union Road	John Street	$10,395.00
2023	270, 271, 66.4C	John Street	Brook Street	Orchard Street	$10,080.00
2023	66, 66.1	Rose Avenue	Union Road	John Street N	$9,990.00
2023	269, 66.8B	Elizabeth Street	Union Road	94 M E of Union Road	$9,870.00
2023	120B	Mellor Road	Fulton Bridge Line	Fruit Ridge Line	$9,310.00
2023	278, 66.11	Courtney Street	Union Road	John Street N	$8,550.00
2023	466, 65.1A	Millpark Street	Fowler Street	83 M NW of Fowler Street	$7,470.00
2023	270, 271, 66.4A	John Street	Elizabeth Street	George Street	$5,145.00
2023	270, 271, 66.9B	John Street N	Courtney Street	End	$1,890.00
2024	88	Boxall Road	Scotch Line	Hunter Line	$157,560.00
2024	43	John Wise Line	Longhurst Line	Talbot Line	$72,625.00
2024	127C	Bush Line	Begg Road	Middle River Road	$49,073.00
2024	30	Lawrence Road	Fourth Line	Gore Fifth Line	$48,195.00
2024	124	Begg Road	John Wise Line	Begg Road	$26,537.00
2024	102	Boxall Road	Union Road	Bush Line	$26,496.00
2024	20	Lawrence Road	690 M SE of Third Line	Fourth Line	$24,220.00
2024	467, 65.8	Glasgow Street	Fingal Line	Union Road	$20,160.00
2024	470, 65.7	Inverness Street	Lanark Street	Fingal Line	$19,620.00
2024	471, 65.5	Argyle Street	Lanark Street	Fingal Line	$18,630.00
2024	469, 65.6A	Lanark Street	Union Road	Inverness Street	$18,000.00
2024	466, 65.1D	Millpark Street	Fowler Street	Fingal Line	$15,120.00

Intervention Year	ID	Street	From Street	To Street	Estimated Cost
2024	465, 65.11	Church Street	Fingal Line	Fowler Street	$13,590.00
2024	474, 65.3	St James Street	Centre Street	End	$9,360.00
2024	472, 65.1B	Centre Street	Spring Street	James Street	$9,000.00
2024	469, 65.6B	Lanark Street	Inverness Street	Argyle Street	$9,000.00
2024	472, 65.1D	Centre Street	Fingal Line	Queen Street	$8,910.00
2024	127A	Bush Line	John Wise Line	29 M W of Begg Road	$8,742.00
2024	472, 65.1A	Centre Street	James Street	Queen Street	$8,550.00
2024	466, 65.1B	Millpark Street	83 M NW of Fowler Street	171 M NW of Fowler Street	$7,920.00
2024	472, 65.1E	Centre Street	Spring Street	85 SE of Spring Street	$7,650.00
2024	127D	Bush Line	Middle River Road	Lyle Road	$7,564.00
2024	475, 65.2	Spring Street	Centre Street	End	$7,470.00
2024	127B	Bush Line	29 M West of Begg Road	Begg Road	$899.00
2025	94	Lake Line	Grand Canyon Road	Scotch Line	$163,863.00
2025	91	Lake Line	Boxall Road	Grand Canyon Road	$158,508.00
2025	97, 91	Thomas Road	Union Road	Union Road	$87,677.50
2025	8	Second Line	Magdala Road	Mill Road	$85,174.00
2025	111A	Mill Road	Bush Line	Middle River Road	$80,185.00
2025	100	Roberts Line	Sparta Line	Town Limit	$11,475.00
2025	111B	Mill Road	Middle River Road	Middle River Road	$7,385.00
2026	96	Lake Line	Scotch Line	Union Road	$112,162.50
2026	54	Shorlea Line	Wonderland Road	Wellington Road	$86,663.00
2026	90	Scotch Line	Boxall Road	Coon Road	$85,986.00
2026	95	Scotch Line	Coon Road	Lake Line	$81,260.00
2026	73A	Wonderland Road	Shorlea Line	Ron McNeil Line	$70,299.00
2026	93	Grand Canyon Road	Lake Line	End	$47,183.50
2026	44	Longhurst Line	John Wise Line	Paynes Mills Road	$44,835.00
2026	103B	Bush Line	Union Road	Boxall Road	$25,885.00
2026	103A	Bush Line	Boxall Road	Munro Line	$21,483.00
2026	103C	Bush Line	Munro Line	Oneida Road	$18,228.00
2026	73B	Wonderland Road	Clinton Line	Shorlea Line	$5,657.50

Intervention Year	ID	Street	Estimated Cost
2017	SW16	Millpark Street	$9,000.00
2018	SW11	Horton Street	$7,380.00
2018	SW12	William Street	$5,760.00
2018	SW17	Argyle Street	$1,350.00
2020	SW30	Talbot Line Talbotville	$21,330.00
2020	SW29	Sunset Road	$11,430.00
2022	SW20	Fingal Line Fingal	$23,634.00
2022	SW18	Church Street	$9,000.00
2022	SW6	Francis Street	$8,730.00
2024	SW28	Gore Road	$32,400.00
2024	SW8	Orchard Street	$14,760.00
2024	SW10	Waugh Street	$5,040.00
2025	SW14	Union Road Fingal	$28,782.00
2025	SW9	Brook Street	$8,820.00
2026	SW3	Union Road Shedden	$26,280.00
2026	SW19	Glasgow Street	$900.00

Last Update to Report **10-Dec-16**

Table 1 - Component Inventory and Condition Report - Maintenance and Replacement Data

Facilities Management Plan - Buildings					Replacement Profile									
ID	Building Name	Category	Location	Year of Construction or Last Replacement	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
BA1	Municipal Office	Administrative	Fingal - Office / Public Works	1967	$278,700	—	—	—	—	—	—	—	—	—
BA1a	Addition	Administrative	Fingal - Office / Public Works	2010	—	—	—	—	—	—	—	—	—	—
BA1b	Addition	Administrative	Fingal - Office / Public Works	2011	—	—	—	—	—	—	—	—	—	—
BA2	Library & Strip Mall	Administrative	Shedden - Intersection	1948	$315,500	—	—	—	—	—	—	—	—	—
BA2a	Strip Mall Roof (half of roof)	Administrative	Shedden - Intersection	2011	—	—	—	—	—	—	—	—	—	—
BA2b	Strip Mall Roof (half of roof)	Administrative	Shedden - Intersection	2012	—	—	—	—	—	—	—	—	—	—
BA3	Medical Centre	Administrative	Shedden - Intersection	1987	—	—	—	—	—	—	—	—	—	—
BFD1	Fire Hall - Station No. 1	Fire Department	Shedden - Union Road South of Shedden	2006	—	—	—	—	—	—	—	—	—	—
BFD1a	Air Conditioning	Fire Department	Shedden - Union Road South of Shedden	2012	—	—	—	—	—	—	—	—	—	—
BFD1b	Polymer Flooring	Fire Department	Shedden - Union Road South of Shedden	2013	—	—	—	—	—	—	—	—	—	—
BFD2	Fire Hall - Old	Fire Department	Shedden - Intersection	1948	$243,900	—	—	—	—	—	—	—	—	—
BFD3	Fire Hall - Station No. 2	Fire Department	Talbotville - Sunset Road	1966	$186,300	—	—	—	—	—	—	—	—	—
BPW1	Equipment Garage	Public Works	Fingal - Office / Public Works	1995	—	—	—	—	—	—	—	—	—	—
BPW2	Office/Garage Building	Public Works	Fingal - Office / Public Works	1995	—	—	—	—	—	—	—	—	—	—
BPW3	Radio Tower / Fixed Equipment	Public Works	Fingal - Office / Public Works	1990	$75,147	—	—	—	—	—	—	—	—	—
BPW4	Salt & Sand Storage Shed	Public Works	Fingal - Office / Public Works	2006	—	—	—	—	—	—	—	—	—	—
BPW5	Public Works Garage	Public Works	Fingal - Office / Public Works	1965	$176,200	—	—	—	—	—	—	—	—	—
BR1	Concession Booth	Recreation	Fingal - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR2	Washrooms / Storage / Lime Shed	Recreation	Fingal - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR3	Washrooms / Lime Sheds	Recreation	Shedden - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR4	Storage Shed	Recreation	Shedden - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR5	Livestock Shelter (Fairgrounds)	Recreation	Shedden - Keystone Area	2000	—	—	—	—	—	—	—	—	—	—
BR6	Picnic Shelter / Concession Booth	Recreation	Shedden - Keystone Area	2002	—	—	—	—	—	—	—	—	—	—
BR7	Keystone Complex & Floodlighting	Recreation	Shedden - Keystone Area	1998	—	—	—	—	—	—	—	—	—	—
BR8	Concession Booth	Recreation	Talbotville - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR9	Picnic Shelter	Recreation	Talbotville - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR10	Washrooms / Storage	Recreation	Talbotville - Ball Park	1980	—	—	—	—	—	—	—	—	—	—
BR11	Fingal Pavilion	Recreation	Fingal - Ball Park	2015	—	—	—	—	—	—	—	—	—	—
BW1	Chlorination Station	Water	Shedden - Talbot Line East of Shedden	1998	—	—	—	—	—	—	—	—	—	—
				TOTAL REPLACEMENT COSTS	$1,275,747	$0	$0	$0	$0	$0	$0	$0	$0	$0

Last Update to Report

Table 2 - Replacement Profile

Replacement Profile													
	Description	Replacement Year Based on Age	Replacement Year Based on Condition	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
B1	Second Line	2020	2019	---	---	$417,918	---	---	---	---	---	---	---
B2	Parson Road	2040	2040	---	---	---	---	---	---	---	---	---	---
B3	Woodplant Road	2020	2020	---	---	---	$553,443	---	---	---	---	---	---
B4	Longhurst Line	2020	2013	$562,754	---	---	---	---	---	---	---	---	---
B5	Lyle Road	2045	2045	---	---	---	---	---	---	---	---	---	---
B6	Oneida Road	2089	2089	---	---	---	---	---	---	---	---	---	---
B7	Burwell Road	2030	2022	---	---	---	---	---	$208,764	---	---	---	---
TOTAL REPLACEMENT COSTS				**$562,754**	**$0**	**$417,918**	**$553,443**	**$0**	**$208,764**	**$0**	**$0**	**$0**	**$0**

Last Update to Report 18-Sep-17

Table 2 - Replacement Profile

Replacement Profile

	Street Name	Replacement Year Based on Age	Replacement Year Based on Condition	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
C1	First Line	2017	2028	---	---	---	---	---	---	---	---	---	---
C2	Southdel Drive	2017	2027	---	---	---	---	---	---	---	---	---	---
C3	Second Line	2045	2045	---	---	---	---	---	---	---	---	---	---
C4	Clinton Line	2017	2025	---	---	---	---	---	---	---	---	$178,220	---
C5	Longhurst Line	2017	2024	---	---	---	---	---	---	---	$117,660	---	---
C6	Longhurst Line	2017	2024	---	---	---	---	---	---	---	$346,058	---	---
C7	John Wise Line	2074	2074	---	---	---	---	---	---	---	---	---	---
C8	McBain Line	2050	2050	---	---	---	---	---	---	---	---	---	---
C9	McDiarmid Line	2067	2067	---	---	---	---	---	---	---	---	---	---
C10	Mill Road	2017	2026	---	---	---	---	---	---	---	---	---	$139,511
C11	Roberts Line	2069	2069	---	---	---	---	---	---	---	---	---	---
C12	Hunter Hill (Lake Line)	2072	2072	---	---	---	---	---	---	---	---	---	---
C13	Hunter Hill (Lake Line)	2089	2089	---	---	---	---	---	---	---	---	---	---
TOTAL REPLACEMENT COSTS				**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$463,718**	**$178,220**	**$139,511**

Last Update to Report **10-Dec-16**

Table 1 - Component Inventory and Condition Report - Maintenance and Replacement Data

Facilities Management Plan - Streetlights					***Replacement Profile***									
ID	Location	Street Name	Count	Year of Construction or Last Replacement	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
SL1	Talbotville	Talbot Line West	5	2013	—	—	—	—	—	—	—	—	—	—
SL2	Talbotville	Sunset Road (South)	10	2013	—	—	—	—	—	—	—	—	—	—
SL3	Talbotville	Sunset Road	7	2013	—	—	—	—	—	—	—	—	—	—
SL4	Talbotville	Talbot Line East	2	2013	—	—	—	—	—	—	—	—	—	—
SL5	Talbotville	Sunset Road (North)	7	2013	—	—	—	—	—	—	—	—	—	—
SL6	Ferndale	Major Line	10	1987	$10,693	—	—	—	—	—	—	—	—	—
SL7	Ferndale	North Street	10	1987	$10,693	—	—	—	—	—	—	—	—	—
SL8	Ferndale	Florence Street	14	1987	$14,970	—	—	—	—	—	—	—	—	—
SL9	Ferndale	James Street	4	1987	$4,277	—	—	—	—	—	—	—	—	—
SL10	Lynhurst	Lynhurst	1	1987	$1,069	—	—	—	—	—	—	—	—	—
SL11	Lawrence Station	Lawrence Station	5	2013	—	—	—	—	—	—	—	—	—	—
SL12	Iona Station	Iona Station	6	2013	—	—	—	—	—	—	—	—	—	—
SL13	Iona (Talbot Line)	Talbot Line	2	1987	$2,139	—	—	—	—	—	—	—	—	—
SL14	Fingal	Church Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL15	Fingal	Fowler Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL16	Fingal	Glasgow Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL17	Fingal	Mill Park Street	4	2012	—	—	—	—	—	—	—	—	—	—
SL18	Fingal	Lanark Street	2	2012	—	—	—	—	—	—	—	—	—	—
SL19	Fingal	Argyle Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL20	Fingal	Inverness Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL21	Fingal	Centre Street	4	2012	—	—	—	—	—	—	—	—	—	—
SL22	Fingal	Victoria Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL23	Fingal	St James Street	1	2012	—	—	—	—	—	—	—	—	—	—
SL24	Fingal	Fingal Line	12	2012	—	—	—	—	—	—	—	—	—	—
SL25	Fingal	Union Road	8	2012	—	—	—	—	—	—	—	—	—	—
SL26	Shedden	John Street	7	2013	—	—	—	—	—	—	—	—	—	—
SL27	Shedden	Elizabeth Street	2	2013	—	—	—	—	—	—	—	—	—	—
SL28	Shedden	John Street North/Rose	2	2013	—	—	—	—	—	—	—	—	—	—
SL29	Shedden	Francis Street	6	2013	—	—	—	—	—	—	—	—	—	—
SL30	Shedden	Hall Street	1	2013	—	—	—	—	—	—	—	—	—	—
SL31	Shedden	Horton Street	2	2013	—	—	—	—	—	—	—	—	—	—
SL32	Shedden	Orchard Street	3	2013	—	—	—	—	—	—	—	—	—	—
SL33	Shedden	Brook Street	1	2013	—	—	—	—	—	—	—	—	—	—
SL34	Shedden	Union Road	12	2013	—	—	—	—	—	—	—	—	—	—
SL35	Shedden	Talbot Line	13	2013	—	—	—	—	—	—	—	—	—	—
SL36	Talbotville Meadows	Shadylane Crescent	21	2013	—	—	—	—	—	—	—	—	—	—
SL37	Talbotville Meadows	Greenpark Drive	4	2013	—	—	—	—	—	—	—	—	—	—
SL38	Talbotville Meadows	Talbotville Gore Road	12	2013	—	—	—	—	—	—	—	—	—	—
SL39	Lynhurst	Lynhurst Park Drive	11	2013	—	—	—	—	—	—	—	—	—	—
SL40	Lynhurst	Lynhurst/Wellington	1	2013	—	—	—	—	—	—	—	—	—	—
SL41	Lynhurst	Lynhurst Court	1	2013	—	—	—	—	—	—	—	—	—	—
				TOTAL REPLACEMENT COSTS	$43,842	$0	$0	$0	$0	$0	$0	$0	$0	$0

Last Update to Report 10-Dec-16 12/10/2016

Table 1 - Component Inventory and Condition Report - Maintenance and Replacement Data

Facilities Management Plan - Recreation Equipment						Replacement Profile									
ID	Asset Name	Location	Description	Costing Method	Year of Construction or Last Replacement	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
RE1	Play Equipment 1	Talbotville Ball Park	Playstructure Design #17056-1A, Rider Frog, Rider Whale	Actual	2004	—	—	$24,552	—	—	—	—	—	—	—
RE2	Play Equipment 2	Shedden Keystone Complex	Funbuilder - KB/PB & Installation, Freight	Actual	2008	—	—	—	—	—	—	$58,578	—	—	—
RE3	Play Equipment 2	Shedden Keystone Complex	Extras	Actual	2011	—	—	—	—	—	—	—	—	—	$6,262
RE4	Play Equipment 3	Fingal Ball Park	2 Swingsets, Playstructure, Tire Swing	Estimate	1980	$20,000	—	—	—	—	—	—	—	—	—
RE5	Play Equipment 4	Fingal Park	Playstructure, Twin Rider Teeter	Actual	2013	—	—	—	—	—	—	—	—	—	—
RE6	Basketball Court 1	Fingal Ball Park	Concrete slab, 2 Nets, Fencing	Estimate	1990	$20,000	—	—	—	—	—	—	—	—	—
RE7	Basketball Court 2	Talbotville Ball Park	Concrete slab, 2 Nets	Estimate	1980	$2,500	—	—	—	—	—	—	—	—	—
RE8	Ball Diamond Groomer	Talbotville Ball Park	Ball Diamond Groomer	Actual	2011	—	—	—	—	—	—	—	—	—	$6,108
RE9	Goal Posts 1	Shedden Soccer Fields	4 Fabricat Soccer Goal Posts 24' x 8' Self Supporting	Actual	2008	—	—	—	—	—	—	$4,917	—	—	—
RE10	Goal Posts 2	Shedden Soccer Fields	12 Wooden Frame Smaller Soccer Nets	Estimate	1990	$3,000	—	—	—	—	—	—	—	—	—
RE11	Goal Posts 3	Talbotville Ball Park	2 Steel Frame Soccer Nets	Estimate	1990	$2,500	—	—	—	—	—	—	—	—	—
RE12	Electronic Scoreboard	Shedden Ball Park	Electronic Scoreboard for Baseball Games	Insurance Forms	1994	$7,300	—	—	—	—	—	—	—	—	—
RE13	Bleachers	Various	Bleachers	Insurance Forms	1990	$32,400	—	—	—	—	—	—	—	—	—
RE14	Recreational Fencing	Various	Talbotville, Shedden x 2, Fingal x 3	Insurance Forms	1990	$90,300	—	—	—	—	—	—	—	—	—
RE15	Floodlights	Various	Floodlights for night events	Insurance Forms	1990	$100,800	—	—	—	—	—	—	—	—	—
					TOTAL REPLACEMENT COSTS	$278,800	$0	$24,552	$0	$0	$0	$63,495	$0	$0	$12,369

Last Update to Report 10-Dec-16 12/10/2016

Table 1 - Component Inventory and Condition Report - Maintenance and Replacement Data

Facilities Management Plan - Land Improvements					Replacement Profile									
ID	Asset Name	Description	Year of Acquisition	Costing Method	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
LI4	Parking Lot	Stn #1 Parking Lot Pavement	2012	Actual	—	—	—	—	—	$50,050	—	—	—	—
LI1	Parking Lot	Stn #2 Parking Lot Pavement	2010	Actual	—	—	—	$18,930	—	—	—	—	—	—
LI5	Fingal Park Entrance and Parking Lot	Fingal Park Entrance and Parking Lot (asphalt and sidewalk)	2013	Actual	—	—	—	—	—	—	$14,231	—	—	—
LI2	Multi-Activity Pad	Multi-Activity Pad, Keystone Complex	2012	Actual	—	—	—	—	—	$44,260	—	—	—	—
LI3	Laneway	Laneway - Keystone Complex (gravel)	2012	Actual	—	—	—	—	—	$23,190	—	—	—	—
LI7	Fencing	Fencing - Works yard (chain link)	2012	Actual	—	—	—	—	—	$8,284	—	—	—	—
LI8	Drain-Complex Property	Horton Drain-new	2015	Actual	—	—	—	—	—	—	—	—	—	—
LI9	Drain-Ball diamond property	Horton Drain-new	2015	Actual	—	—	—	—	—	—	—	—	—	—
LI6	Ferndale Park Path, Sign, Parking	Ferndale Park Path, railing, concrete block, sign, parking (Pathway, railings, concrete block, cedars)	2014	Actual	—	—	—	—	—	—	—	$23,512	—	—
				TOTAL REPLACEMENT COSTS	$0	$0	$0	$18,930	$0	$125,785	$14,231	$23,512	$0	$0