

Asset Management Plan

*The Corporation of the United Townships
of Head, Clara and Maria*

Final Report

Submitted By:



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September, 2014

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 Corporation of the United Townships of Head, Clara and Maria (Townships) has placed asset management as a strategic priority. The present AMP report, along with the asset management tools delivered to the Townships, 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.

Dillon Consulting Limited (Dillon) was retained by the Townships to develop an Asset Management Plan (AMP), which will contribute to the Townships' 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.

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 budget 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. The asset value considered for asset management purposes is determined based on the current full reconstruction costs for each type of asset. For the Townships, the value of the assets included in this project was estimated at just under \$7 million. The following table shows the specific distribution of the asset value.

Asset Value		
Infrastructure Network	Quantity	Current Replacement Cost
Buildings	5 buildings	\$1,024,206
Parks and Boat Ramps	5 assets	\$235,743
Environmental Assets	5 assets	\$48,670
Culverts	106 structures	\$265,941
Gravel Roads	40 kilometers	\$5,157,100
Total Asset Value		\$6,731,659

Based on these results and the recommended 2% yearly investment in maintenance, theoretically the Townships should allocate approximately \$135,000 per year to ensure future sustainability of its assets.

Current Needs Summary

An analysis is usually performed which assumes an unlimited budget to gain insight on the current state of local infrastructure. Although an unlimited budget is not a reality for any municipality, the analysis 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 municipality, indicating in this case a backlog of needs.

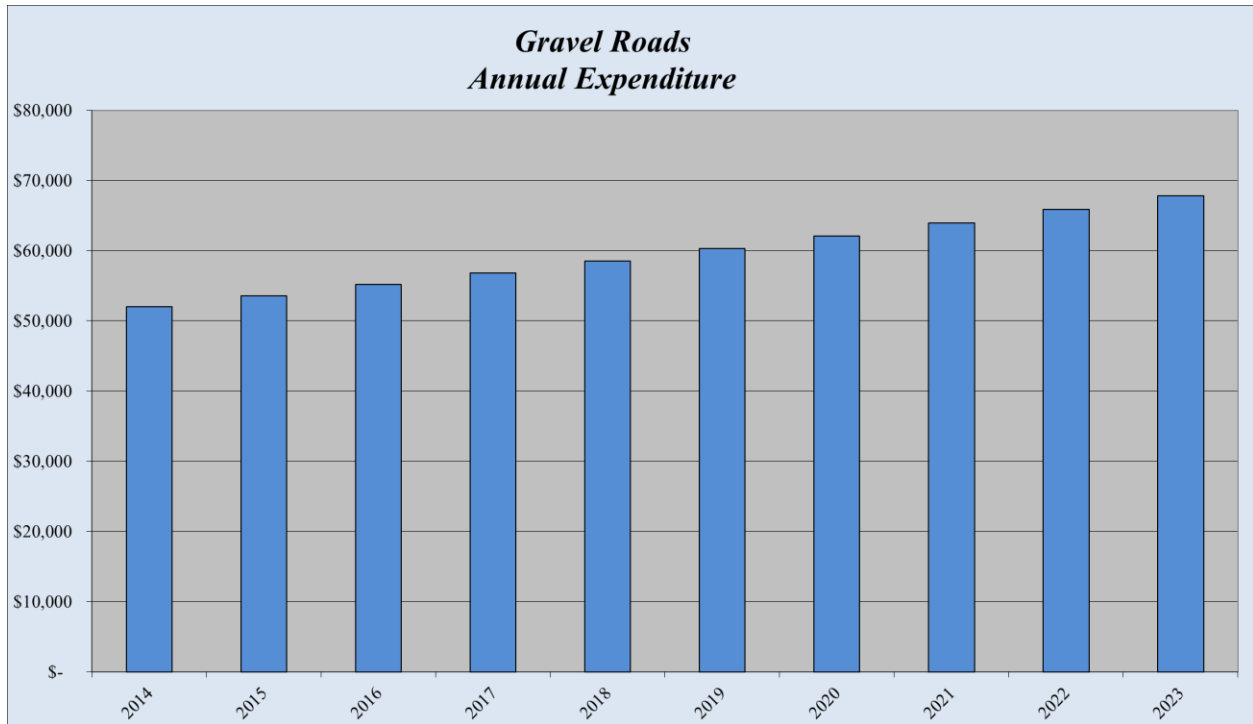
This analysis was completed on the Townships' assets to determine the current needs of the system. The current needs summary was completed to understand the needs within the upcoming year for the infrastructure. Through analysis, it was found that no current capital needs are required within the Townships' and that routine maintenance will be sufficient to continue to provide an adequate level of service to the residents.

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 Townships. No detailed condition assessment survey was carried out on the Townships' networks and assets. To develop a capital program, we used asset data, including physical asset attributes, year of construction, service lives and replacement costs. This information was used to approximate timing for rehabilitation and replacement for the Townships assets.

Gravel Road Network

The Townships currently allot funding annually for rehabilitating gravel roads. The average yearly cost from 2011-2013 incurred is approximately \$52,000. This cost includes culverts, road maintenance, gravel resurfacing, grading, calcium and ditching associated with gravel road resurfacing activities taking place twice annually. This budget is sufficient to provide the services required to the road network. With an annual inflation value of 3%, the anticipated allotment of funding required to maintain the road network will increase annually, as shown in the following figure for a 10-year period.



It is anticipated that the allotted budget will be sufficient to maintain the gravel road network.

Buildings

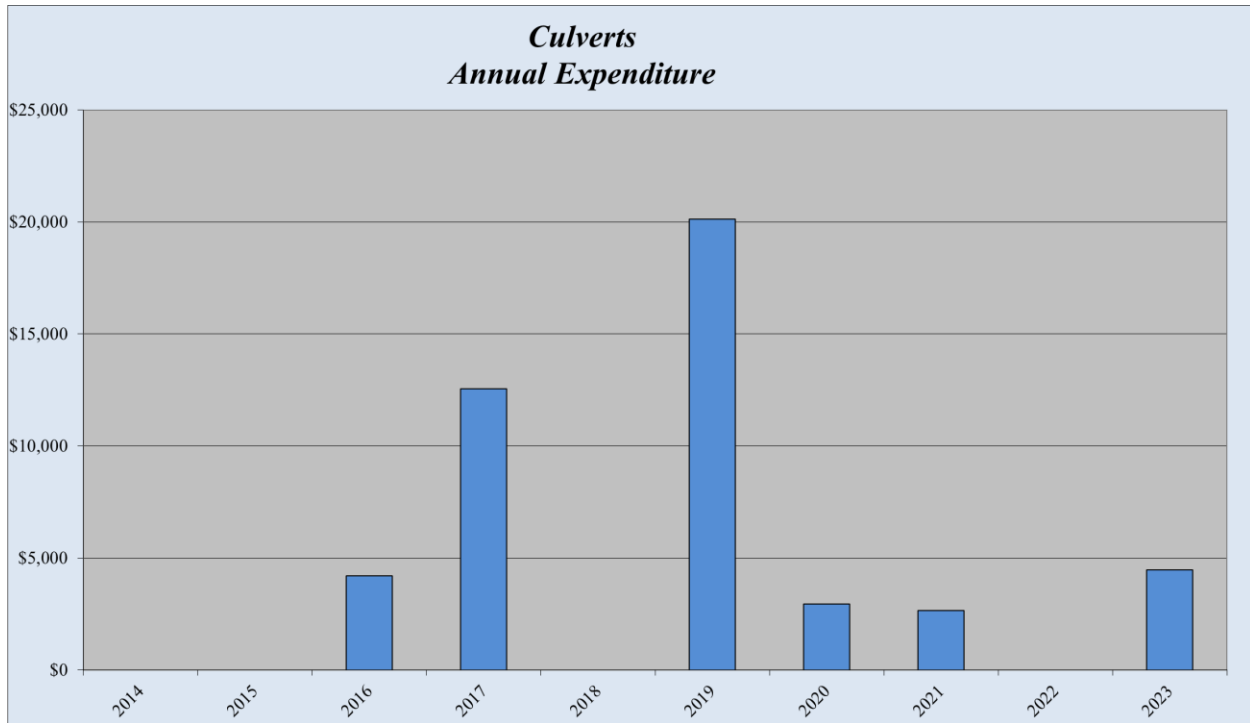
The current age and conditions of the buildings and building components are such that within a 10-year timeframe, only one repair has been identified. In 2020, it is anticipated that \$3,046 will be required to upgrade the security system.

Additional Infrastructure

The condition of the parks and boat ramps, and environmental assets are such that no within a 10-year timeframe, significant expenditures are not anticipated. The Townships should not require significant additional expenditure to maintain these assets.

Culvert Assets

Within the ten year timeframe analyzed, needs were identified within six individual years. The expenditures range in magnitude, the maximum expenditure being incurred in 2019 at an expenditure slightly higher than \$20,000. This expenditure correlates with work for 5 culvert structures. A total of 14 structures are identified for rehabilitation over the 10-year timeframe. The results of the analysis are shown in the following figure.



It is anticipated that the expenditure noted will maintain the culvert assets in good condition.

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 solutions 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 includes funding requirements that will ensure sustainability of the assets and continue to provide an adequate level of service to the residents. The strategy developed is realistic and affordable. The Townships have only identified one revenue source that will support the Asset Management Plan (AMP) developed through this report. The funding source is from reserves accumulated over time.

To develop a financing strategy to be implemented by the Townships, the total of the expenditure requirements were summed annually. The Townships provided details regarding their current financial status, including reserves values. The available funding was compared with the required expenditures to determine where the Townships incurs a shortfall, and must address it through seeking additional funding (grants, subsidies), utilizing reserves, debt, or other methods to address infrastructure needs. It is noted that within the analyzed timeframe the Townships, generally, through reserves, are able to address the expenditures required to maintain their assets.

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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 Corporation of the United Townships of Head, Clara and Maria (Townships) has placed asset management as a strategic priority. The present AMP report, along with the asset management tools delivered to the Townships, 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

Dillon Consulting Limited (Dillon) was retained by the Townships to develop an Asset Management Plan (AMP), which will contribute to the Townships’ 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.

1.3. The Corporation of the United Townships of Head, Clara and Maria

The Corporation of the United Townships of Head, Clara and Maria is located within the County of Renfrew, in the Province of Ontario. Located on the Trans-Canada Highway 17, the United Townships are bordered to the north by the Ottawa River and to the South by Algonquin Park. The Townships were incorporated in 1878, and have a population of 235 residents. *Figure 1* illustrates the location of the Townships.

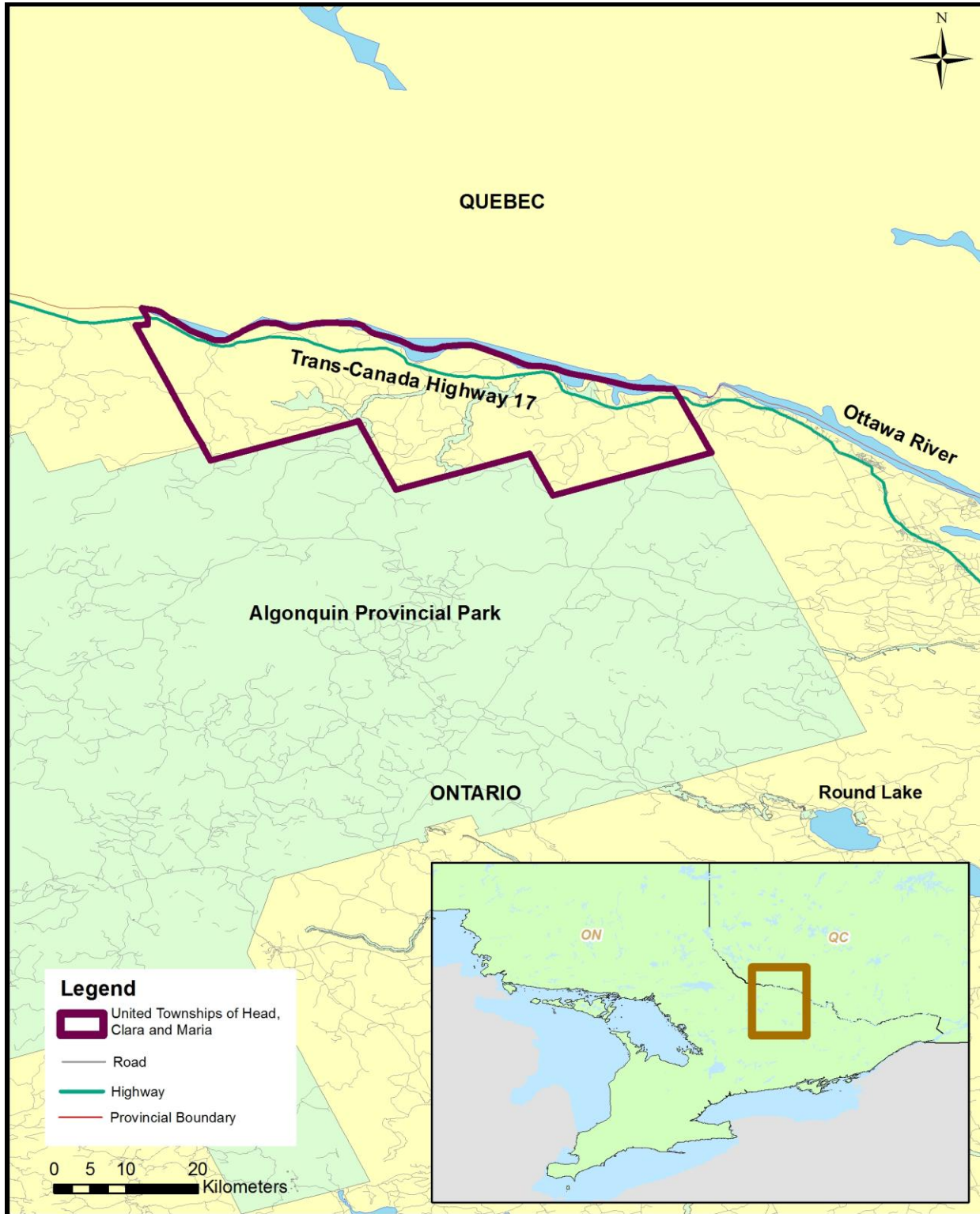


Figure 1: The Corporation of the United Townships of Head, Clara and Maria - Location Map

2.0 PROJECT TEAM

To ensure that all technical and financial aspects of the plan were addressed, the Townships included representatives from all relevant departments in the project. The project team representatives from the Townships included:

- Melinda Reith – Municipal Clerk and Chief Administrative Officer (CAO)
- Noella LeBreton – Treasurer/Deputy Clerk
- 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 Townships' 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 made available by the province were 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 Townships 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 assets included in the AMP are:

- 40 km of gravel roads;
- 106 culverts structures;
- Municipal buildings and facilities;
- Municipal parks and boat ramps; and
- Environmental assets (including bear fences and containers).

Detailed information of the assets can be found in the digital database delivered to the Townships. The information is all included in the asset management tools delivered to the Townships, 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 Townships' existing databases, particularly those which were developed for Public Sector Accounting Board (PSAB) purposes. Less significant assets such as library inventory were not included in this project. 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 Townships' 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 current and future infrastructure needs of the Townships.

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 Townships, 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 Townships possess 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 Townships 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 – Gravel Road Network

Prior to project initiation, the Townships’ staff had already created a database for their linear infrastructure, including gravel roads. 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 length and surface type of the roads, and typical gravel road maintenance operations were 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 – Culvert, Building and Facility Assets

The main source of information for the point assets was 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 Townships' 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 for point assets, the main source of information was the PSAB database. The values for original cost of construction or purchase of the assets provided in the PSAB were inflated where required to obtain an approximation of the current replacement cost, at a 3% increase annually to the present year. Replacement costs for culverts were determined based on length of the culvert, and an average unit cost per meter of construction. Unit construction costs were verified by Townships staff, and were developed based on recent construction activities in the area.

3.3. Condition Assessment

3.3.1. Road Network Condition Assessment Process

The Townships currently maintain their gravel roads by rehabilitating or regarding them twice annually. This process is undertaken based on a program, which ensures each road segment is revisited twice annually. If the condition of a road is identified as particularly poor, the road segment will be prioritized within the upcoming round of road resurfacing work.

3.3.2. Point Asset Condition Assessment Process

The condition assessment undertaken for the point assets (including all non-linear assets) involved theoretical deterioration of the assets based on collected data. The PSAB database contained information including year of construction, service lives, and original costs. These were used with a linear deterioration model to approximate timing for rehabilitation and replacement of the assets. The approximations were reviewed by staff and adjusted in some cases to better reflect known condition of some assets. The final results were reviewed and endorsed by staff.

3.4. State of Local Infrastructure Analysis

Dillon developed a simple and practical tool to manage point assets, which can also be used for linear assets. Point assets are assets such as bridges and culverts, buildings, facilities, treatment plants and pump stations while linear assets include roads, watermains, and sewers. Point 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 2** illustrates the AMP tool interface.

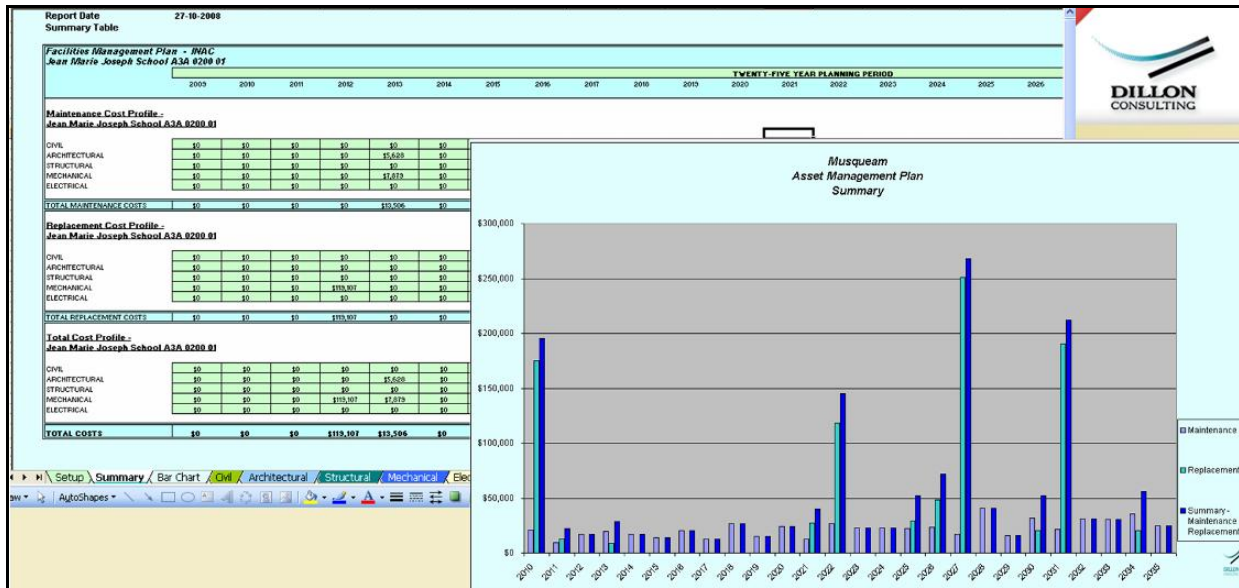


Figure 2: Condition Assessment Tool

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. Townships’ staff will continue to use the application 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 by government authorities.

The most common regulations that apply to infrastructure include:

- Minimum Maintenance Standards for Municipal Highways
- Ontario Structure Inspection Manual (OSIM)
- 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 3*.



Figure 3: 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 Head, Clara and Maria

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 and its remaining service life which can be monitored over time.

The Townships’ current levels of service, measured in terms of remaining service life, were determined in consultation with the Townships’ project team. By combining that information with staff knowledge, 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 tool described previously was provided to staff to monitor the levels of service over time, and to determine the levels of budget required to maintain the assets at acceptable 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. Existing Infrastructure and Condition

The current state of existing infrastructure has significant bearing on the replacement or rehabilitation profile for the assets. The following provides an overview of how the current state was determined.

5.1.1. Gravel Road Network

The Townships' road network consists of gravel road surfaces. Gravel roads are maintained on a continual basis using an allotted operation and maintenance fund. The road network is approximately 40 kilometers in length, with a standard width of 6.5 meters. The road network was initially constructed in 1960, and has been continually maintained since.

5.1.2. Buildings

The Townships own and operate multiple municipal buildings and facilities, including the Municipal office, hall, library, garage, and monument. The initial construction of the municipal office, hall and library was in 1968 and 1973 for the garage; however the buildings have undergone multiple renovations and upgrades since. The buildings have been componentized and each component type has been attributed an appropriate normal life expectancy, varying between 10-50 years. Based on the ages and life expectancies of the components and overall buildings, the building assets are considered to be in good condition, with a current condition index value of 0.80.

5.1.3. Parks and Boat Ramps

The Townships assets include three boat launches, parks, playground equipment and pavilion. These assets are all in good condition, having been acquired or constructed no earlier than 1997. The assets have all been attributed a normal life expectancy of 50 years. The current condition index of the assets was calculated to be 0.99, indicating assets in very good condition.

5.1.4. Environmental Assets

Environmental assets owned by the Townships include bear fences and containers. The assets were acquired between 2007 and 2012, including initial acquisition and subsequent additions. A normal life expectancy for the bear fences is 20 years, and 25 years for containers. Based on these expectancies and ages, the current overall condition of the environmental assets is very good, with a current condition index of 0.77.

5.1.5. Culvert Assets

The Townships own 106 culvert structures. These structures range in date of construction from 1960 to the present day. Assessment of the structures is undertaken on a routine basis, through OSIM inspection program in conjunction with the County of Renfrew. The majority of culverts within the network currently serve as spring flow structures, however nearly as many currently convey flow all year. The 106 culvert structures within the Townships have been given a condition rating, with over half of the structures, or 59, considered in "excellent" condition; 30 as "good", 13 as "fair"; only one structure was identified as having a rusted bottom. This generally indicates that the network is in very good condition. Based on a linear depreciation of the culverts based on their age and normal life expectancy, the culvert assets have a condition index value of 0.49. This number is theoretical, and the condition assessments supersede these values, as they are more representative of actual conditions.

5.2. 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 budget 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. The asset value considered for asset management purposes is determined based on the current full reconstruction costs for each type of asset. For the Townships, the value of the assets included in this project was estimated at just under \$7 million. The **Table 1** and **Figure 4** show the specific distribution of the asset value.

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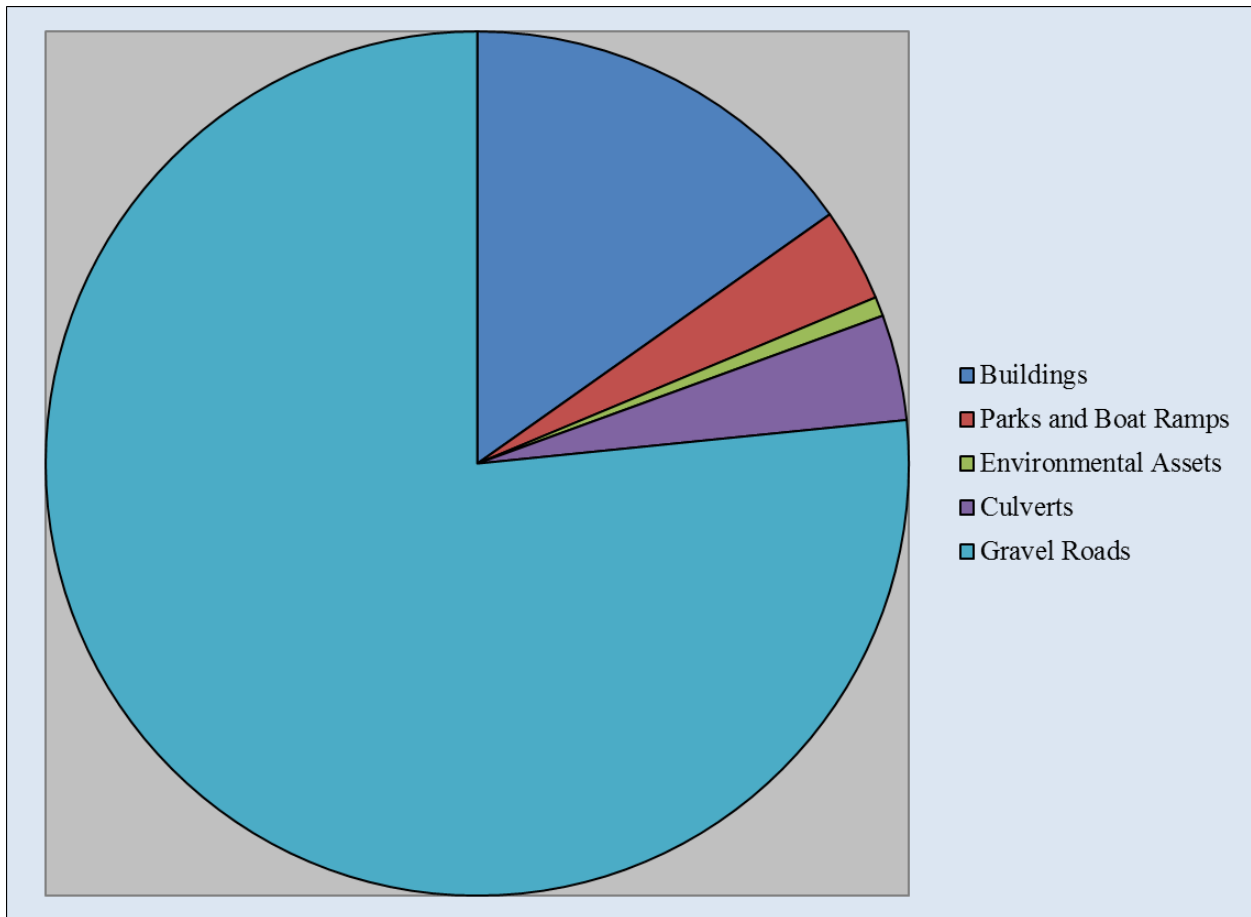


Figure 4: Current Asset Value

Based on these results and the recommended 2% yearly investment in maintenance, theoretically the Townships should allocate approximately \$135,000 per year to ensure future sustainability of its assets.

5.3. Unlimited Budget Scenario

An analysis is usually performed which assumes an unlimited budget to gain insight on the current state of local infrastructure. Although an unlimited budget is not a reality for any municipality, the analysis 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 municipality, indicating in this case a backlog of needs.

5.4. Current Needs Summary

This analysis was completed on the Townships' assets to determine the current needs of the system. The current needs summary was completed to understand the needs within the upcoming year for the infrastructure. Through analysis, it was found that no current capital needs are required within the Townships' and that routine maintenance will be sufficient to continue to provide an adequate level of service to the residents.

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 Townships. No detailed condition assessment survey was carried out on the Townships' networks and assets. To develop a capital program, we used asset data, including physical asset attributes, year of construction, service lives and replacement costs. This information was used to approximate timing for rehabilitation and replacement for the Townships assets.

6.1. Current Funding Level

6.1.1. Gravel Road Network

The Townships currently allot funding annually for rehabilitating gravel roads. The average yearly cost from 2011-2013 incurred is approximately \$52,000. This cost includes culverts, road maintenance, gravel resurfacing, grading, calcium and ditching associated with gravel road resurfacing activities taking place twice annually. This budget is sufficient to provide the services required to the road network. With an annual inflation value of 3%, the anticipated allotment of funding required to maintain the road network will increase annually, as shown in **Figure 5** for a 10-year period.

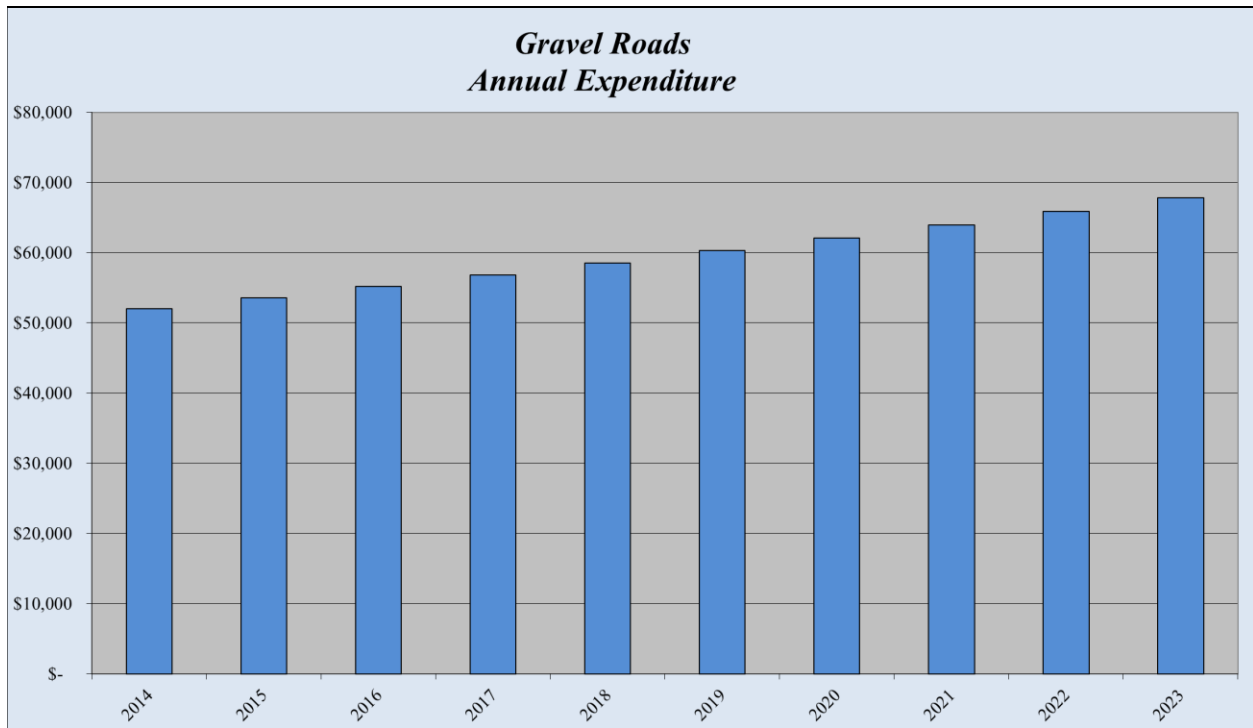


Figure 5: Annual Estimated Gravel Road Expenditure

It is anticipated that the budget allocations shown will be sufficient to maintain the road network in a good level of service.

6.1.2. Buildings

The condition of the buildings is such that within a 10-year timeframe, only one expenditure has been identified. In 2020, it is anticipated that \$3,046 will be required to upgrade the security system.

6.1.3. Parks and Boat Ramps

The condition of the park and boat ramp assets is such that continuous repair is not required within a 10-year timeframe. The Townships should not require significant expenditure to maintain these assets.

6.1.4. Environmental Assets

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

6.1.5. Culvert Assets

Within the ten year timeframe analyzed, needs were identified within six individual years. The expenditures range in magnitude, the maximum expenditure being incurred in 2019 at an expenditure slightly higher than \$20,000. This expenditure correlates with work for 5 culvert structures. A total of 14 structures are identified for rehabilitation over the 10-year timeframe.

Figure 6 illustrates the results of our analysis for culverts. A detailed list of all culverts requiring repair or replacement within the next 10 years can be found in **Appendix A**.

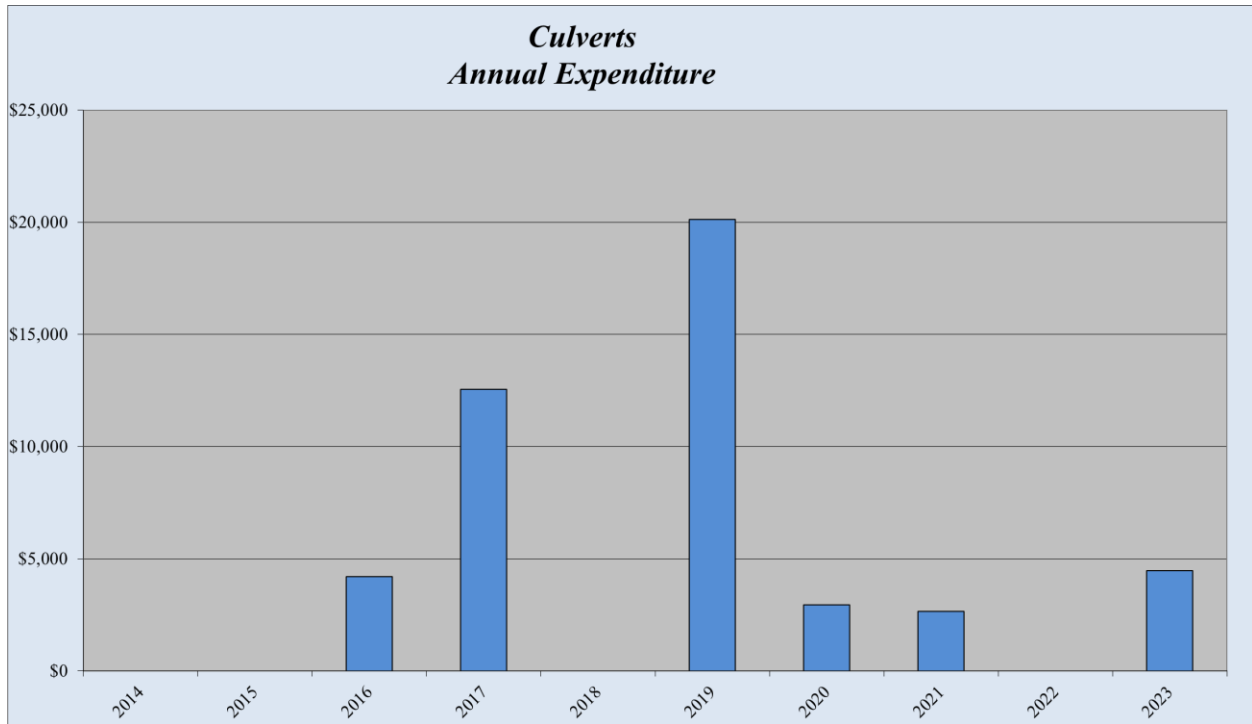


Figure 6: Annual Estimated Culvert Expenditure

It is anticipated that through the yearly expenditure as noted above for culvert rehabilitation, that the network will remain in good condition.

6.2. Asset Management Policies

6.2.1. Approach to Data Assembly

The Townships currently manage a large amount of infrastructure data and information. It is recommended to continue to incorporate additional information related to all assets and create what is referred to as an enterprise database. This is critical for on-going infrastructure management activities within the Townships' organization. The database used in preparation of the AMP encompasses asset information that can support multiple business functions. **Figure 7** and **Figure 8** illustrate the concept of going from an ad-hoc data environment to a structured enterprise database.

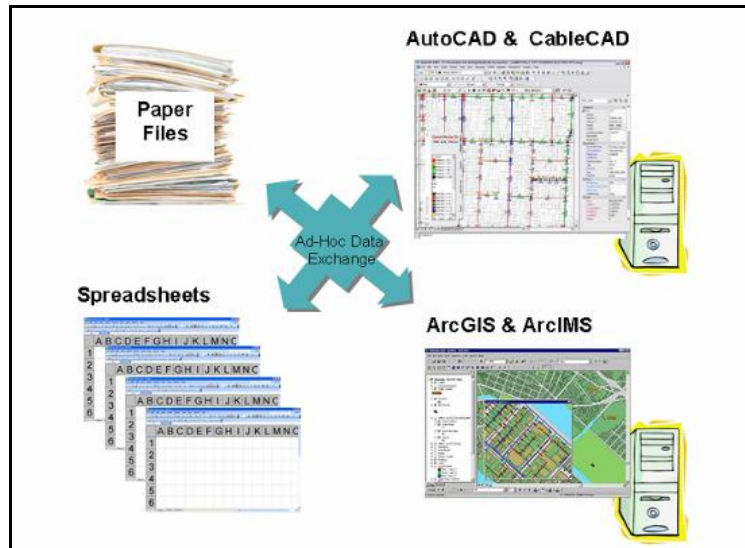


Figure 7: Ad Hoc Environment

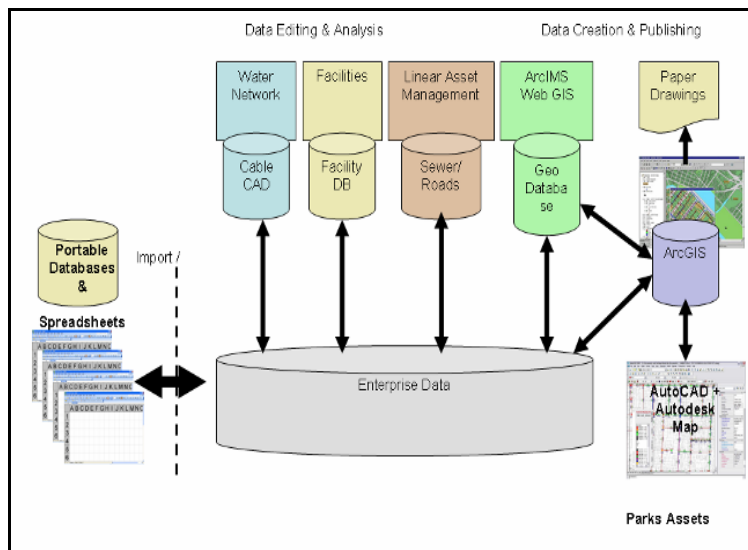


Figure 8: Recommended "Enterprise" Environment

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. However, considering the size of the Townships and the types and number of assets managed by them, the MS Excel tool/database is more than adequate to continue to maintain their assets.

6.2.2. Condition Assessment Strategy

In continuing to maintain a detailed AMP over time, it is recommended that the Townships continue to inspect their infrastructure assets. It is critical to ensure the data is current and accurate, in order to maintain a useful AMP.

Roads should continue to be maintained twice annually, with adjustments made to the program dependent on condition, should it be necessary.

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.

6.2.3. 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 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. The Townships seem to have a good program in place and should continue to maintain that practice.

6.3. 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 Townships 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.

6.4. 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 assign priorities to infrastructure repair and minimize disruption to the general public. Some criteria that should be looked at when assigning priorities could be:

1. Traffic volume – Roadways carry different traffic volume, and defects on higher traveled roads should be addressed first.

2. Access to a community: In some cases, a municipality may only have one or two access points that are serviced by large culverts. These should be fixed first when defect 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:

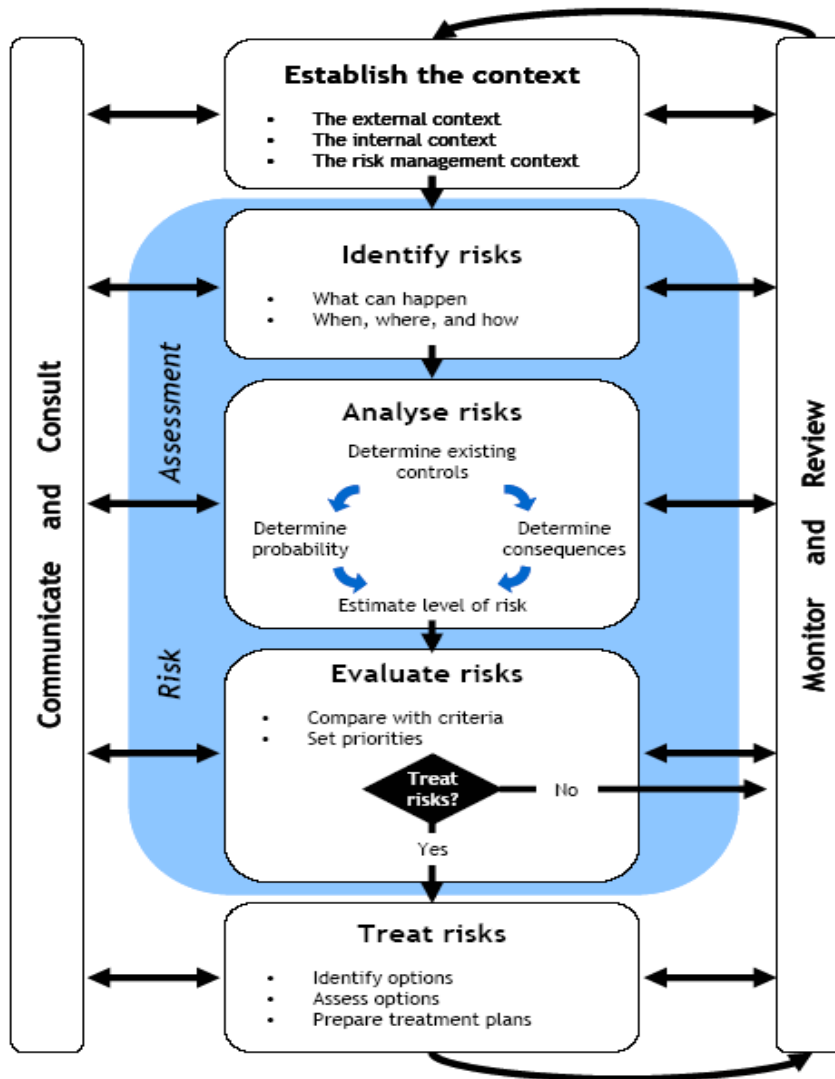


Figure 9: Framework for Identification of Critical Assets

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 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 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. United Townships Financing Strategy

We have worked with Townships' 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 the Townships. The strategy developed is realistic and affordable.

The United Townships have identified the following funding sources to deal with daily financial challenges as well as, provide for the current/future maintenance/replacement costs regarding our buildings, parks & boat ramps, environmental assets, culverts and roads:

- Taxes based on assessment trends
 - property taxes (residential, commercial & industrial properties)

- PILs (payments in lieu re: Provincial/tenant properties), Railway Right of Way payments (railway corridor), Grants in Lieu of Hydro (OPG)
- Funding from other levels of government:
 - Gas Tax (Federal and Provincial), OMPF, Recycling grants, special grants (they take advantage of whatever opportunities that becomes available for the municipality)
- Other municipal revenues to help offset municipal costs for several services:
 - donations, fundraising, interest (treasury & general Accounts)
 - user fees & charges
 - building permits, tipping fees, recreation programs and facility usage
 - Reserves and reserve funds
 - Money set aside for future needs, e.g. asset replacement, disposal sites maintenance/replacement, parks/recreation, buildings etc.
 - When they realize a surplus, it is put into reserve/reserve funds for the municipality's future needs.

The revenue generated from these funding sources will support the Asset Management Plan (AMP) developed through this report. The Townships maintain and operate a reserves fund through which their capital costs are addressed. The Townships add to their reserve funds annually, and draw from them when needs arise. The balance of the reserve funds in total were nearly \$1M after 2013. The available funding is categorized into differing types of funds, to address capital expenditures across the Townships in addition to infrastructure.

The present state of the reserve funds, the anticipation of the continuation of adding value to these funds annually, and the results of the anticipated expenditure analysis suggests that the current financial strategy employed by the Townships will be sufficient to address future infrastructure capital requirements.

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>

Canadian Federation of Municipalities and Infrastructure Canada. (2002). *National Guide to Sustainable Municipal Infrastructure [InfraGuide]*.

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

Department of Economics, Trent University (2006): *A State of Disrepair: How to Fix the Financing of Municipal Infrastructure in Canada*, No. 241 ISSN 0824 – 8001

APPENDIX A

Infrastructure Needs for Linear and Point Assets

Appendix A - Infrastructure Needs for Linear and Point Assets

Draft Facilities Management Plan - Culverts			Replacement Profile									
ID	Structure Location	Year of Construction or Last Replacement	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
TWPR0001C Adelard Rd												
TWPR0001C-1	Adelard Rd	2009	---	---	---	---	---	---	---	---	---	---
TWPR0001C-2	Adelard Rd	1996	---	---	---	---	---	---	---	---	---	---
TWPR0001C-3	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-4	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-5	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-6	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-7	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-8	Adelard Rd	2006	---	---	---	---	---	---	---	---	---	---
TWPR0001C-9	Adelard Rd	2006	---	---	---	---	---	---	---	---	---	---
TWPR0001C-10	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-11	Adelard Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0001C-11	Adelard Rd	2006	---	---	---	---	---	---	---	---	---	---
TWPR0001C-11	Adelard Rd	2011	---	---	---	---	---	---	---	---	---	---
TWPR0002C Ashport Rd												
TWPR0002C-1	Ashport Rd	1990	---	---	---	---	---	---	---	---	---	---
TWPR0002C-2	Ashport Rd	1996	---	---	---	---	---	---	---	---	---	---
TWPR0002C-3	Ashport Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0002C-4	Ashport Rd	1996	---	---	---	---	---	---	---	---	---	---
TWPR0002C-5	Ashport Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0002C-6	Ashport Rd	1989	---	---	---	---	---	---	---	---	---	---
TWPR0002C-7	Ashport Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0002C-8	Ashport Rd	2012	---	---	---	---	---	---	---	---	---	---
TWPR0002C-9	Ashport Rd	2009	---	---	---	---	---	---	---	---	---	---
TWPR0002C-10	Ashport Rd	2011	---	---	---	---	---	---	---	---	---	---
TWPR0003C Boat Launch Rd												
TWPR0003C-1	Boat Launch Rd	1998	---	---	---	---	---	---	---	---	---	---
TWPR0003C-2	Boat Launch Rd	1991	---	---	---	---	---	---	---	---	---	---
TWPR0004C Boudreau Rd												
TWPR0005C Buckshot Rd												
TWPR0005C-1	Buckshot Rd	2008	---	---	---	---	---	---	---	---	---	---
TWPR0005C-2	Buckshot Rd	2008	---	---	---	---	---	---	---	---	---	---
TWPR0006C Cotnam Rd												
TWPR0006C-1	Cotnam Rd	2010	---	---	---	---	---	---	---	---	---	---
TWPR0006C-2	Cotnam Rd	2006	---	---	---	---	---	---	---	---	---	---
TWPR0007C Crossing Rd												
TWPR0007C-1	Crossing / Mclsaac	2010	---	---	---	---	---	---	---	---	---	---
TWPR0008C Desjardin Rd												
TWPR0009C Donnelly Rd												
TWPR0009C-1	Donnelly Rd	2013	---	---	---	---	---	---	---	---	---	---
TWPR0009C-2	Donnelly Rd	2012	---	---	---	---	---	---	---	---	---	---
TWPR0009C-3	Donnelly Rd	1999	---	---	---	---	---	---	---	---	---	---
TWPR0009C-4	Donnelly Rd	2003	---	---	---	---	---	---	---	---	---	---
TWPR0009C-5	Donnelly Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0009C-6	Donnelly Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0009C-7	Donnelly Rd	1994	---	---	---	---	---	\$1,431	---	---	---	---
TWPR0010C Dunlop Cres												
TWPR0010C-1	Dunlop Cres	1992	---	---	---	---	---	---	---	---	---	---
TWPR0010C-2	Dunlop Cres	1982	---	---	---	\$5,141	---	---	---	---	---	---
TWPR0010C-3	Dunlop Cres	1976	---	---	\$4,207	---	---	---	---	---	---	---
TWPR0010C-4	Dunlop Cres	2006	---	---	---	---	---	---	---	---	---	---
TWPR0010C-5	Dunlop Cres	1994	---	---	---	---	---	---	---	---	---	---
TWPR0010C-6	Dunlop Cres	1987	---	---	---	\$2,467	---	---	---	---	---	---
TWPR0010C-7	Dunlop Cres	1987	---	---	---	\$2,467	---	---	---	---	---	---
TWPR0010C-8	Dunlop Cres	1987	---	---	---	\$2,467	---	---	---	---	---	---
TWPR0011C Francoeur Rd												
TWPR0011C-1	Francoeur Rd	1994	---	---	---	---	---	---	---	---	---	---
TWPR0011C-2	Francoeur Rd	1994	---	---	---	---	---	---	---	---	---	---
TWPR0011C-3	Francoeur Rd	1994	---	---	---	---	---	---	---	---	---	---
TWPR0011C-4	Francoeur Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0011C-5	Francoeur Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0011C-6	Francoeur Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0011C-7	Francoeur Rd	1997	---	---	---	---	---	---	---	---	---	---
TWPR0012C Gully Ln												
TWPR0013C Harvey Creek Rd												
TWPR0013C-1	Harvey Creek Rd	1996	---	---	---	---	---	---	---	\$2,658	---	---
TWPR0013C-2	Harvey Creek Rd	2001	---	---	---	---	---	---	---	---	---	---
TWPR0013C-3	Harvey Creek Rd	2004	---	---	---	---	---	---	---	---	---	---
TWPR0013C-4	Harvey Creek Rd	2001	---	---	---	---	---	---	---	---	---	---
TWPR0014C Jennings Rd												
TWPR0014C-1	Jennings Rd	2005	---	---	---	---	---	---	---	---	---	---
TWPR0014C-2	Jennings Rd	2010	---	---	---	---	---	---	---	---	---	---

Appendix A - Infrastructure Needs for Linear and Point Assets

Draft Facilities Management Plan - Culverts				Replacement Profile									
ID	Structure Location	Year of Construction or Last Replacement	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
			TWPR0015C	Jobidon Rd									
TWPR0016C	Kenny Rd												
TWPR0016C-1	Kenny Rd	2005	---	---	---	---	---	---	---	---	---	---	
TWPR0016C-2	Kenny Rd	2011	---	---	---	---	---	---	---	---	---	---	
TWPR0016C-3	Kenny Rd	2006	---	---	---	---	---	---	---	---	---	---	
TWPR0016C-4	Kenny Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0017C	Loggers Rd												
TWPR0017C-1	Loggers Rd	2012	---	---	---	---	---	---	---	---	---	---	
TWPR0017C-2	Loggers Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C	Mackey Creek Rd												
TWPR0018C-1	Mackey Creek Rd	2010	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-2	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-3	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-4	Mackey Creek Rd	2008	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-5	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-6	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-7	Mackey Creek Rd	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-8	Mackey Creek Rd	2002	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-9	Mackey Creek Rd	1999	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-10	Mackey Creek Rd	2007	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-11	Mackey Creek Rd	1997	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-12	Mackey Creek Rd	1992	---	---	---	---	---	---	\$1,474	---	---	---	
TWPR0018C-13	Mackey Creek Rd	1992	---	---	---	---	---	---	\$1,474	---	---	---	
TWPR0018C-14	Mackey Creek Rd	1995	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-15	Mackey Creek Rd	1995	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-16	Mackey Creek Rd	1993	---	---	---	---	---	---	---	---	---	\$4,469	
TWPR0018C-17	Mackey Creek Rd	2009	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-18	Mackey Creek Rd	2000	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-19	Mackey Creek Rd	1992	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-20	Mackey Creek Rd	2001	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-21	Mackey Creek Rd	1997	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-22	Mackey Creek Rd	1993	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-23	Mackey Creek Rd	1979	---	---	---	---	---	\$6,518	---	---	---	---	
TWPR0018C-24	Mackey Creek Rd	2008	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-25	Mackey Creek Rd	1970	---	---	---	---	---	\$695	---	---	---	---	
TWPR0018C-26	Mackey Creek Rd	2001	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-27	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-28	Mackey Creek Rd	1998	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-29	Mackey Creek Rd	1996	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-30	Mackey Creek Rd	1997	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-31	Mackey Creek Rd	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0018C-32	Mackey Creek Rd	2005	---	---	---	---	---	---	---	---	---	---	
TWPR0019C	Mclssac Dr												
TWPR0019C-1	Mclssac Dr	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0019C-2	Mclssac Dr	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0019C-3	Mclssac Dr	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0019C-4	Mclssac Dr	2011	---	---	---	---	---	---	---	---	---	---	
TWPR0020C	Pine Valley Rd												
TWPR0021C	Plains Camp Rd												
TWPR0022C	Rivermead Rd												
TWPR0023C	Township Hall Rd												
TWPR0023C-1	Township Hall Rd	1960	---	---	---	---	---	\$8,359	---	---	---	---	
TWPR0024C	Trappers Rd												
TWPR0024C-1	Trappers Rd	2006	---	---	---	---	---	---	---	---	---	---	
TWPR0025C	Yates Rd												
TWPR0025C-1	Yates Rd	1980	---	---	---	---	---	\$3,135	---	---	---	---	
YB	Yates/Buckshot												
YB-1	Yates/Buckshot	2004	---	---	---	---	---	---	---	---	---	---	
YB-2	Yates/Buckshot	2004	---	---	---	---	---	---	---	---	---	---	
TWPR0025C	Mackey Boat Ramp												
TWPR0025C-1	Mackey Boat Ramp	2000	---	---	---	---	---	---	---	---	---	---	
			\$0	\$0	\$4,207	\$12,541	\$0	\$20,138	\$2,949	\$2,658	\$0	\$4,469	