The Corporation of the Township of Chamberlain

Asset Management Plan

Preparing for the future and embracing the present…..

Prepared for the Corporation of the Township of Chamberlain
By: Amy Vickery-Menard, CMO
Clerk-Treasurer
Township of Evanturel

Approved & Adopted:

Updated: April 2017 (Chamberlain Township Admin Staff)

Next update scheduled: April 2018

Executive Summary

The Township of Chamberlain, as a small rural municipality in Northern Ontario, is a quiet community with existing infrastructure mainly rural in nature such as graveled roads and bailey type bridges. Many of the assets of the municipality have been managed to date with some maintenance investment to aid in the preservation of assets and has been supported through Provincial/Federal support where available.

As indicated in the Building Together guide for Asset Management Plans set out by the Ministry of Infrastructure most of Ontario infrastructure is aging and deteriorating while demand grows for better infrastructure facilities. This demand is in response to higher standards of safety, accessibility, health, environmental protection, and regulation. The solution proposed to this issue is to examine the way the municipalities plan, design and manage infrastructure to meet changing demands.

The existing infrastructure within the Township of Chamberlain is adequate with some sections fair to near complete deterioration. Through a comprehensive analysis of all asset types and current replacement costs, it was determined a significant infrastructure deficit is imminent and planning accordingly is necessary. A formal capital plan is required to address this deficit and serious strategies, partnerships and advocacy are deemed to be necessary. There is the need for Long Range Planning and change.

Overview

It is necessary for municipalities to set out a plan for assets including performance, levels of service, strategies for implementation and consideration for long term financing and debt considerations.

New concepts need to be implemented and long term thinking. One proven way of doing this is to apply Long Range Infrastructure Planning (LRIP). LRIP is not a new concept. It has been widely used for many years and has evolved into what is now more commonly known as "Asset Management". Staff have reviewed long range infrastructure strategies, current technical and financial practices and consolidated them into an Asset Management Plan.

The Asset Management Plan as presented in this report is comprised of the following components:

1. An overview of the fundamentals of an Asset Management Plan based upon best management practices obtained from various sources; although this information is somewhat complex for small municipalities and difficult to scale down and simplify for smaller organizations.

2. An Asset Management Strategy for each major asset class and broken down further into specific projects, if warranted. This format was selected to ensure that the asset management strategies as attached in Appendix A, could be updated from time to time according to changes to the condition assessments. The Asset Management Plan as presented in this report is a systematic process that allows for the operating, maintenance, and betterments of the municipality's assets in a cost effective manner. Implementing an Asset Management Plan will assist the municipality to become improved stewards of their assets with real data and will provide long-term strategies to become sustainable.

3. A financial review and strategy using a combination of theoretical data and real field data that will provide a long range financial planning resource that will be based on needs rather than wants.

4. Inventories of assets that are considered assets either as a group of assets such as culverts or gravel roads or inventories for the purpose of maintenance for provisions in the annual operating budget; in support of long range planning.

Introduction

Background

Infrastructure Investment is vital and a universal approach to planning for infrastructure is necessary. Recognizing that municipalities deliver many of the services that are critical to Ontarians, and that these services rely on well-planned, well-built and well maintained infrastructure, the Government of Ontario created a 10 year infrastructure plan, Building Together, and a municipal infrastructure strategy. The goal of the strategy is to standardize and provide consistency in municipal asset management. Asset Management Planning is the foundation of the strategy and the goals include making good asset management planning universal, moving toward optimal use of financing tools and addressing challenges of small communities.[1]

Asset Management Planning – What is it?

Asset Management Planning is the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing, and disposing of infrastructure assets. The objective is to maximize benefits, manage risk, and provide satisfactory levels of service to the public in a sustainable manner. [2]

The concept is to develop a plan for the management of infrastructure assets within the municipality that combines management techniques, including technical and financial, over the lifecycle of the asset(s) to a specified level of service in the most cost-effective, sustainable manner.

An Asset Management Plan also incorporates the existing preventative maintenance and risk management programs to prevent or minimize the risk of failure or provide an extension to the life cycle. The preventative maintenance component ensures that the day-to-day wear and tear on the asset is dealt with to ensure that the asset can reach its expected lifecycle. The risk management component ensures that Staff manages the risk through due diligence.

Asset Management Plan – Why does the Municipality want one?

The Asset Management Plan is to prioritize needs to maintain infrastructure over the long term. The plan will help ensure that investments are made at the right time, using the best tools available to minimize rehabilitation costs and create good stewardship.

The result will be the collaboration of information and an enhanced municipal budgeting and planning process by modeling future capital costs into a long range financial plan.

It will provide a clear understanding of the future budget pressures and assist in providing options on closing any infrastructures gaps. It will provide a strategic vision and implementation plan for infrastructure. This plan will cover the forecasted needs for the next 10 years and provides possible financial strategies for those next 10 years.

[1] Building Together Guide for Municipal Asset Management Plans, Ministry of Infrastructure.
[2] Building Together Guide for Municipal Asset Management Plans, Ministry of Infrastructure.

Asset Management Plan – What are the benefits?
Specific benefits associated with an Asset Management Plan are:

- Better decision making
- More effective communications with ratepayers, elected officials, organizations and regulatory agencies
- Consistent levels of service
- Better management of risk to the municipality
- More effective financial planning that ensures sustainability
- Reduces lifecycle costs
- Leads to more efficient data management
- Facilitates the implementation of policy objectives
- Avoids problems and potential crises
- Positive internal cooperation and partnerships
- Maps a course of action

Asset Management Plan – What are the key principles?
Asset management can be characterized by the following key principles:

- A strategic and proactive approach to management of infrastructure
- A comprehensive long-term view of infrastructure performance and cost
- Measures the municipal financial capacity to meet the overall strategic and business plans of the municipality.
- A visible and transparent approach that requires effective communication among all stakeholders.
- A plan involving choices that are policy driven and prioritized.
- An ongoing program – a "living" document.

Chamberlain's Asset Management Plan – What are the essential elements?
The approach to the Township of Chamberlain Asset Management Plan is to manage assets that the municipality has direct ownership over and consideration of strategies for those jointly owned or operated. An example would be the shared assets under the ownership of the Joint Fire Department and the financial impact to the Township of Chamberlain when planning for asset replacement. This information will be provided as determined and attached to this report, tied to the capital plan.

In terms of accounting for the value of assets as determined under PSAB, the assets identified in this plan are considered significant with an opening netbook value at December 31st, 2016 of $1,254,627.

Specific strategies, technical ratings and in some cases, specific plans are set out for these assets in the appendices as attached. Also included in this plan are inventories of groups of assets such as culverts and annual maintenance schedules of unpaved roads. These inventories are to be recognized and form part of the annual operating budget process but are more of a level of maintenance and not considered significant in terms of capital assets.

A further note is on the items capital in nature and defined as an asset, however the asset may not be considered for replacement beyond the life of the asset. An example of this would be land owned by a municipality for winter sand purposes. This land is considered an asset and is for the purpose of winter sand operations. Should the land no longer be valuable as a sand pit the asset would likely be disposed of and sand would be purchased annually through the annual operating budget for winter operation. The budget impact would not be that significant, thus planning for replacement unnecessary.

In order for an Asset Management Plan to fulfill the principles of asset management, the following essential components will be contained in the overall plan:

1. Asset Database and Values:
   All municipal infrastructure assets will be accounted for and have a monetary value. This value is determined by the actual capital value for some of the assets and for others an estimated value. Most of these values were determined through the Tangible Capital Asset process using PSAB 3150 Guidelines. Refer to the Township of Chamberlain Tangible Capital Asset Policy and By-law.

2. Lifecycle Management & Maintenance
   All assets have a limited life expectancy. To some degree the rate of deterioration can be estimated. A decision made at any point in time in the lifecycle of an asset has an effect on the remaining life and may have operational implications and related costs. The estimated lifecycle for each asset as presented in this report is contained in the asset inventory summary and managed through an inventory in Municipal Data Works (MDW).

3. Sustainability:
   In terms of Asset Management Planning, sustainability means identifying a plan over the long term to ensure that sufficient monies are available to replace, rehabilitate or properly dispose of that asset at the optimal time with the intention of achieving the lowest lifecycle cost. The plan helps to provide taxpayer equity and fairness over the long term and identifies challenges, barriers and opportunities.

4. Integration of Technical and Financial Plans:
   The plans must intermingle to minimize lifecycle costs for the infrastructure while maintaining an adequate level of service at the lowest possible level of risk. The long term financial plan must identify the financial investment required per year for each asset over the long term, including any larger than normal expenditures to meet the requirements of the technical plan. Without a Long term financial plan there is risk and the two plans should be integrated so the relationship between the level of service and the cost can be quantified. The plans attached to this report integrate the financial investment level required to the level of service. The technical and financial relationship may change from time to time depending on the outcome of asset condition assessments.

5. Risk Assessment
   Risk should be managed in any decision making process. The municipality should analyze and document acceptable risk tolerance. The probability of failure is taken into account while the condition of the asset is being analyzed. The condition survey leads to determining the rate of failure and the consequences of such failure. Risk factors can include financial, environmental, regulatory/legal and public health and safety.

6. Performance Measurement
   To optimize an Asset Management Plan, performance of the assets and rehabilitation strategies should be monitored regularly and adjustments made at the appropriate stage in the asset lifecycle to achieve and acceptable balance between cost and the performance (level of service). The municipality can take advantage of the tools provided by various organizations such as OGRA. Small municipalities are challenged to have the full range of resources to provide proper universal benchmarking. With use of the Municipal Data Works (MDW) provided by OGRA it will

be the intention for the municipality to make performance measurement a best management practice moving forward.

Studies, Strategies and Other Initiatives to support or provide guidance with this plan:

- Englehart & Area Regional Community Profile, 2013
- Englehart & Area Economic Development Strategic Plan, 2013
- AECOM Municipal Structure Inventory and Inspection 2014
- Central Timiskaming Planning Board Official Plan, 2012
- Consolidated Financial Statements & supporting financial records 2016
- TSI Inc. Municipal Structure Inventory and Inspection 2016

Data Collection and Integration

As a member of OGRA, the municipality has taken advantage of providing asset data to the association to help with the construction of a province wide database through OGRA's Municipal Data Works (MDW) program. MDW is a data collection point for all roads related assets of member municipalities in Ontario. OGRA uses the data as an illustrative tool to understand the infrastructure gap in the province. This is then used for demonstrative purposes when the association lobbies the Ontario Government for increased grant funding to provide for asset renewal and rehabilitation of roads and bridges. More importantly the data is used to establish asset management best practices and performance measures for the municipal sector.

Another undertaking of the data integration to support the Asset Management Plan is the purchase of GIS Software that will identify various layers of infrastructure. The system should help staff to monitor scheduled maintenance and to record and monitor inspection results and work order schedules. The common database will also ensure that everyone is working from the same page to ensure coordination of projects. The GIS Software system was installed and running in 2015.

The end result is that capital projects can be better planned, and the long term planning associated with the asset management plan can be better managed with the intention of maximizing the life of the asset.

State of Local Infrastructure

A summary

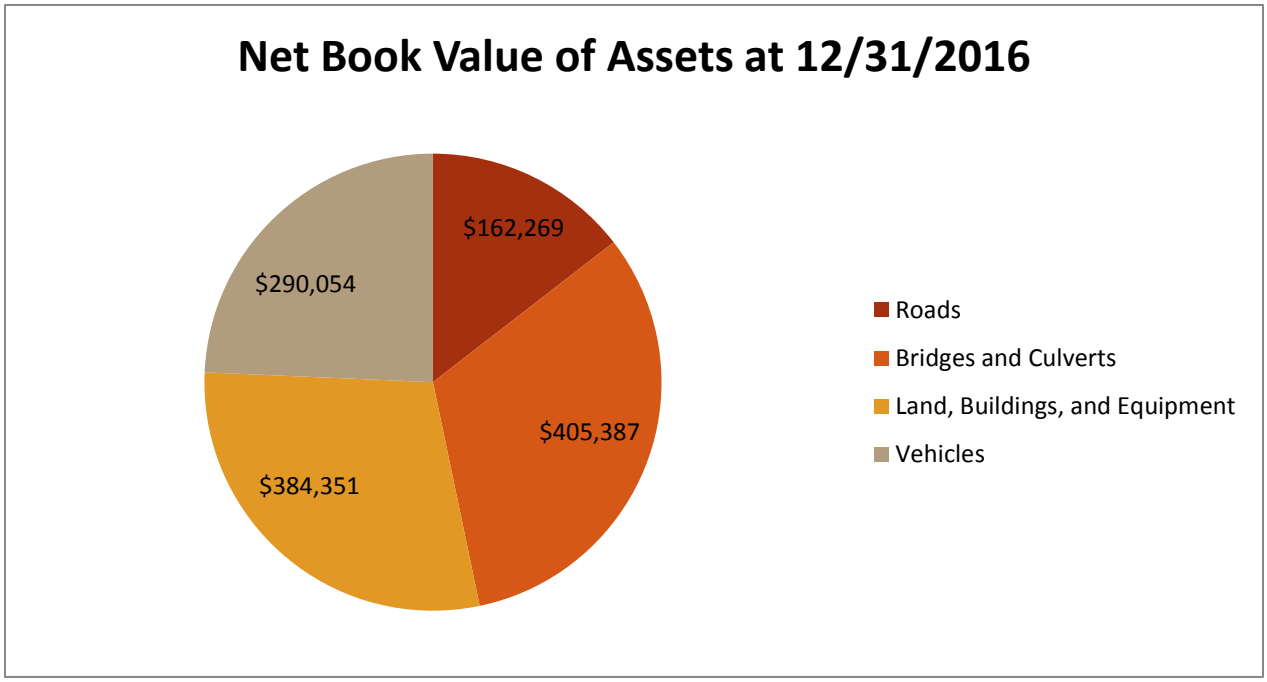
The Municipality has the following assets under its control and responsibility:

Hard Topped Roads with Surface Treatment	7.8 lane kilometers
Gravel Roads – Year Round Maintenance	137 lane kilometers
Gravel Roads – Seasonal Maintenance	4.2 lane kilometers
Bridges	2 wood bailey structures
	2 concrete structures
Large Culverts over 3m diameter	6
Road Culverts of various sizes	
Vehicles & Equipment	1 light duty vehicle
	2 heavy duty vehicles
	4 pieces of heavy equipment
Land & Buildings	Municipal Office with Community Hall
	Municipal Garage
	Recreation building & ball fields

*Exclusion – fire department assets, waste disposal site and recycling.

The state of local infrastructure according to the PSAB exercise represented as Net Book Value of Assets is summarized in Table 1 below.

Table 1



Condition of Assets

The Township of Chamberlain current Capital Asset inventory and subsequent estimated historical cost and anticipated capital is identified in Table 2.

It should be noted that the depreciation only considers the replacement of assets at the historical (original) purchase price and not the current replacement value. A full understanding of state of infrastructure the requirements are attached in each strategy in the appendices.

Table 2

	Historical (Original) Cost	Net Book Value Dec 2016	**2017 Budget**	**Anticipated Backlog between 2022-2024**
Land & Buildings	661,284	384,351	**0**	**0**
Vehicles	557,470	290,054	**0**	**851,747**
Bridges & Structures	1,159,095	405,387	**0**	**3,367,000**
Roads	383,698	162,269	**0**	**129,086**
Total	*2,761,547**	*1,242,061*	***0***	***4,347,833***
**excludes Road Signage original values from PSAB of $6,500. Actual total $2,768,047. As per Schedule 51A.*				

Levels of Service (LOS)

Historically the municipality has provided satisfactory levels of service with the assets available. Moving forward will prove to be a burden on the municipality's financial capacity.

Depending on the type of asset, will depend on the expected level of service, moving forward.

Overall, levels of service are established by Council and policy makers and thus should be reflected by public input. It is unclear if the Township of Chamberlain formally sought public input on the expected levels of service specific to asset management however some past initiatives include:

- Englehart & Area Regional Community Profile, 2013
- Englehart & Area Economic Development Strategic Plan, 2013
- Township of Chamberlain Strategic Planning Exercise
- Official Plan Review, approved 2012
- Zoning By-law Review, adopted 2013

The quality, cost and current manner in which the services are provided seemed to be satisfactory in general. Currently the municipality does not capture or collect technical performance measures other than ensuring minimum maintenance standards. Best practices and experience are relied upon heavily. It is also very difficult to benchmark and compare techniques or compare one municipality to the other.

The industry led technical requirements most often referred to are:

- Provincial Minimum Maintenance Standards
- Drinking Water Quality Management Systems
- Engineering Standards Manuals such as Ontario Structure Inspection Manual (OSIM) and OPS Standards.

As the municipality progresses with the management of assets, operating performance indicators should be prepared to have a balance between asset replacement and capital funding and ongoing maintenance for the best cost efficiency and service productivity.

Capital Planning

Overview

The Capital plan is one of the most important components of the AMP. The development of the capital plan is intended to ensure that policy makers are responsible to the residents and community with respect to expending public funds. The capital plan also sets priorities based on needs rather than wants. It is intended to assist in making choices about projects that should be implemented, how they should be financed and when to establish priorities for its spending on services while controlling the impact.

The Township of Chamberlain has determined a 10 year capital plan that provides a detailed understanding of anticipated investments into capital assets required and potential strategies for implementation. A complete Capital Plan will provide the following:

- Coordination between capital needs and operating budgets
- Better control of tax rates
- Provides for the most economical methods of financing
- Increases ability to advocate for Provincial and Federal funds
- Relates to community policies and plans
- Focuses attention on objectives and goals
- Keeps the public informed and involved
- Encourages careful planning and design to avoid costly mistakes
- Measures risk and mitigates consequences.

Two main considerations when managing infrastructure are:

1- Maintenance and repair of existing infrastructure to ensure assets are kept in good working condition for as long as possible.
2- Planning for new infrastructure; starting with the identification of needs, planning and prioritizing and investing to complete on time and on budget.

Municipalities manage a variety of diverse assets. The Capital Plan takes into consideration assets that have the following characteristics:

- Held for the purpose of delivering a program or service or to produce something;

- It is to be used on a continuing basis and is not intended for sale.
- Has a life expectancy beyond one year.
- Has a value greater than $10,000 for all civil infrastructure systems or $5,000 per unit cost for all other assets.

To determine how much money is required to be allocated to existing infrastructure the following factors are taken into consideration:

- Inventory
- Condition rating
- Betterments
- New infrastructure requirements
- Predictable growth or limitations
- Future forecasts
- Service Levels
- Shared service opportunities

Methodology:

The following methods were used to determine the needs under the capital plan.

Step 1 - Financial Projections

Projections were made on existing infrastructure by inflating the historical costs to present value (2016). Consideration should be given to inflating these values over the 10 year plan based on the Consumer Price Index (CPI) or other valuation to ensure full cost realization is accounted for. Some of the projections were based on condition, such as the bridge condition index.

Step 2 – Data Integration

The information was then integrated into the MDW tool Capital Planning Module (CIP). This tool identified the Township of Chamberlain's current infrastructure deficit and future capital requirements. This proposed plan is set out in Table 3.

Final Capital Plan

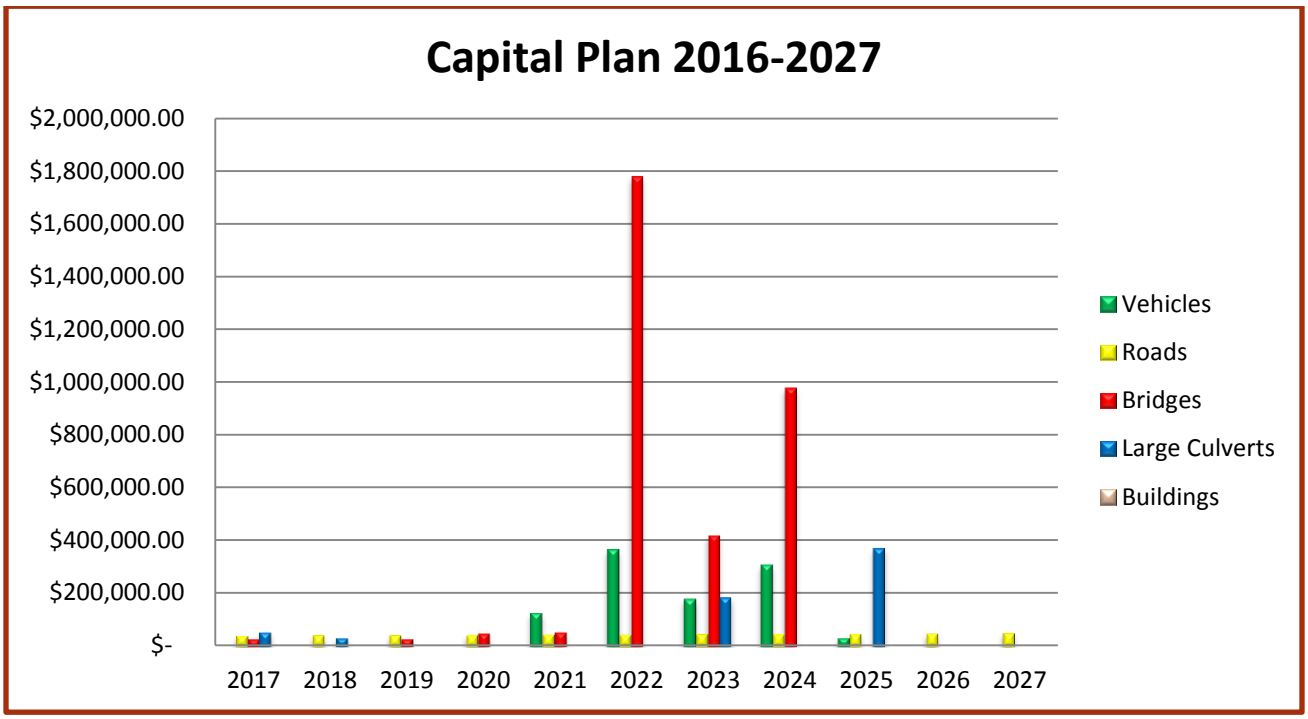
The 10 year Capital Plan as identified is set out in Table 3. Various strategies are proposed and options should be discussed and considered. Some further work is required to measure the best alternatives and cost versus benefit in some respects. One example of this would be the acquisition of new equipment. Should the expense be greater than the benefit, replacing/acquiring equipment upon failure, should be considered against the level of service and option of contracting the work.

Project information to support the Capital Plan is set out in Appendix C labelled - Asset Class, List of Projects Report. The projects have been prioritized and comments on specific strategies are identified in this report. This report should continue to be a working document as staff and council work through the construction and rehabilitation program and make solid conclusions on levels of service, funding opportunities, etc.

The Township of Chamberlain Capital Plan seems achievable at the outset. Although it is more challenging between the years 2022-2024. The projects may have to be funded through reserves or long term debt and planned carefully.

One risk identified in postponing capital is the deferral of financial burden and the risk of infrastructure failure and possible increased risk to emergency situations.

Table 3



Vehicles

Asset Name	Current NBV	Replacement New 2017	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
2013 Chevrolet Silverado ½ Ton	$12,309	$25,000									$31,669		
1996 JCB Backhoe/ Loader	$8,846	$113,000					$127,182						
1988 JD 70D Excavator	$10,272	$150,000							$179,108				
2000 Plow Truck	$0												
****2007 Tandem Axle Float**	****$7,000**	****$25,000**							****$29,851**				
2007 CAT Grader	$152,929	$315,000						$365,171					
2011 International Workstar	$103,250	$250,000								$307,468			
***Riding Mower**	***$2,448**	***3,000**											***4,032**
Totals	**$287,606**												

*Riding Mower for Rec Dept $2,448 brings total to $290,054**Not included in statements

Roads

Asset Name		2017	2018	2019	2020	2021	2022	2023	2024	2025
Wabewawa Road	Surface Treatment									
Various Unpaved Roads	Gravel *	$38,203	$38,967	$39,747	$40,542	$41,353	$42,180	$43,023	$43,883	$44,761
	*$18/yrd	**2,000 yrds/year + 2% inflation**								

Bridges (based on 2016 reports)

Asset Name	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lyons Bridge 47-115	$5,000				$15,000		$62,000		
Bailey Bridge 47-114	$8,000			$20,000			$40,000	$980,000	
Aidie Creek Bridge 47-112	$9,000			$30,000			$320,000		
Krugerdorf Bridge 47-99	$7,000		$30,000		$40,000	$1,780,000			
Totals	**$29,000**		**$30,000**	**$50,000**	**$55,000**	**$1,780,000**	**$422,000**	**$980,000**	

Large Culverts (based on 2016 reports)

Asset Name	2017	2017	2018	2019	2020	2021	2022	2023	2024	2025
Blackburn #4	$4,000									$185,000
Crocodile Creek #5	$1,000	$1,000								
Crocodile Creek #6	$4,000							$185,000		
West Road #2	$4,000	$32,000								
Crocodile Creek #1	$4,000		$32,000							
Blackburn #3	$4,000									$185,000
Totals	**$21,000**	**$33,000**	**$32,000**					**$185,000**		**$370,000**

Buildings

Asset Name	NBV	Replacement New 2017	2018	2019	2020	2021	2022	2023	2024	2025
New Garage	$251,784	$413,000								
Old Garage	$0	$0								
Sand/Salt Shed	$13,118	$114,000								
Storage Shed	$3,685	$0								
Rink/Ball Storage	$11,508	$31,000								
Field Lights	$0	$80,000								
Municipal Hall/Office	**$75,837**	**$350,000**								
Septic and Well	**$955**	**$30,000**								
Landfill Building	**$798**	**$10,000**								
Total	**$357,685**	**$1,028,000**								

* Landfill monitoring of wells $1,358 brings total to $359,043

See Appendix D for Summary Action Reports by Engineer. Some work is recommended; some with costs and others without much cost. Work should be planned, prioritized and costed out accordingly, keeping in mind time for approvals, etc.

Financial Strategy

The 10 year capital plan was determined from an all-encompassing review and considerations to proposed financial strategies.

To determine the financial strategy, we first reviewed the fiscal environment, economic condition of the area, the taxes receivable and the affordability. A review of the reserve position of the municipality, debt and financial position as well as a comfortable annual repayment limit were taken into consideration in drafting proposed strategies.

Funding capital expenditures generally are by way of the three following methods:

- Internal Sources – current budget, reserves, sale of an asset.
- External Sources – government grants, donations, other third party contributions.
- Debt – debentures, leases, bank loans.

Fiscal Environment
The Township of Chamberlain has the typical rural challenges of a weak economic base, constraints on residential assessment, along with limited population.

Demographics:

2016 Federal Census Population	332
2011 Federal Census Population	297
2006 Federal Census Population	322
2001 Federal Census Population	348
Households (2013)	165
Size of the Municipality	110.22 Sq. km

Current Debt

Our current debt position for infrastructure at December 31, 2016 is $0.

Annual Repayment Limit
The Township of Chamberlain ARL as estimated by the Province is $98,498 (effective January 1st, 2017) which represents 25% of revenues less net debt charges. A more favourable debt capacity for the Municipality should be considered and measured against the profitability of investment income and depending upon the nature of the debt. Debt should reflect whether the lifecycle extends beyond the debt and if the debt to be considered impacts the municipality as a whole rather than one limited sector.

I would recommend the Municipality undergo a debt capacity exercise to determine the Annual Repayment Limit well below the Provincial estimate.

Reserves

The Reserve position at December 31, 2016 is $270,745, representing $815.50 per person. The reserve position seems adequate; however the question remains "what is adequate"? Reserves should not be confused with Reserve Funds. Obligatory Reserve Funds must be created whenever a statute requires revenues received for special purposes be segregated from the general revenues such as revenue in lieu of land for park purposes under the Planning Act. A breakdown of the reserve position is as follows:

Non statutory reserves:

Working capital	$183,902
ONR Crossing Reserve	$ 12,000
Machinery Replacement	$ 36,369 (Equipment $10,369 and Fire Truck $26,000)
Ball Diamond Reserve	$ 5,900
Parks and Recreation	$ 1,000
Recreation Committee Reserve	$ 31,574
Total	$270,745

Taxation & Assessment

All would not be complete without understanding further the impact to residents through taxation. The following Table 5 provides projected values of assessment. The levies and rates set out in Table 6 identify the taxation impact of a consistent 5% increase in the municipal levy. This increase may not be substantial enough to sustain the capital program. Consideration should be given to the impact of taxation.

Table 5 - Tax Assessment

2017 Assessment Totals

Chamberlain Township, 5454

	2012 Base Year Values		2016 Base Year Values		Phased-in Values						
Property Class (RTC)	2012 Base CVA at 2017 Roll Return	2012 Base CVA Active	2016 Base CVA at 2017 Roll Return	2016 Base CVA (2020) Active	2016 CVA Active from 2016 Roll Return	2016 CVA from 2017 Roll Return	2016 CVA Active from 2017 Roll Return	2017 Roll Return CVA	2017 Active CVA	2018 Projected/ Active CVA	2019 Projected/ Active CVA
Taxable											
R - Residential	19,852,600	19,852,600	24,971,500	24,971,500	19,852,600	19,852,600	19,852,600	20,798,425	20,798,425	22,189,450	23,580,475
C - Commercial	478,000	478,000	588,100	588,100	471,500	478,000	478,000	487,900	487,900	521,300	554,700
P - Pipeline	18,731,000	18,731,000	21,598,000	21,598,000	18,731,000	18,731,000	18,731,000	19,447,750	19,447,750	20,164,500	20,881,250
F - Farmland	3,464,700	3,464,700	5,733,600	5,733,600	3,464,700	3,464,700	3,464,700	4,028,550	4,028,550	4,596,900	5,165,250
Commercial Total	**478,000**	**478,000**	**588,100**	**588,100**	**471,500**	**478,000**	**478,000**	**487,900**	**487,900**	**521,300**	**554,700**
Industrial Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Taxable	**42,526,300**	**42,526,300**	**52,891,200**	**52,891,200**	**42,519,800**	**42,526,300**	**42,526,300**	**44,762,625**	**44,762,625**	**47,472,150**	**50,181,675**
Total Taxable Exclud	**42,526,300**	**42,526,300**	**52,891,200**	**52,891,200**	**42,519,800**	**42,526,300**	**42,526,300**	**44,762,625**	**44,762,625**	**47,472,150**	**50,181,675**
PIL											
R - Residential	59,100	59,100	42,600	42,600	59,100	59,100	59,100	40,500	40,500	41,200	41,900
C - Commercial	80,000	80,000	77,000	77,000	80,000	80,000	80,000	77,000	77,000	77,000	77,000
Commercial Total	**80,000**	**80,000**	**77,000**	**77,000**	**80,000**	**80,000**	**80,000**	**77,000**	**77,000**	**77,000**	**77,000**
Industrial Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total PIL	**139,100**	**139,100**	**119,600**	**119,600**	**139,100**	**139,100**	**139,100**	**117,500**	**117,500**	**118,200**	**118,900**
Total PIL Including R	**139,100**	**139,100**	**119,600**	**119,600**	**139,100**	**139,100**	**139,100**	**117,500**	**117,500**	**118,200**	**118,900**
Total Taxable and PIL	**42,665,400**	**42,665,400**	**53,010,800**	**53,010,800**	**42,658,900**	**42,665,400**	**42,665,400**	**44,880,125**	**44,880,125**	**47,590,350**	**50,300,575**
E - Exempt	380,000	380,000	372,900	372,900	380,000	380,000	380,000	330,150	330,150	344,400	358,650
Grand Total	**43,045,400**	**43,045,400**	**53,383,700**	**53,383,700**	**43,038,900**	**43,045,400**	**43,045,400**	**45,210,275**	**45,210,275**	**47,934,750**	**50,659,225**

Table 6
Tax Levies & Rates

Projected 2017 Tax Rates Summary						
Using OPTA calculated rates on January 12, 2017 3:56PM EST.						
Assessment Data Filter Option Used: No Limits, Include PIL Properties						
2016 Levy	Residential	Commercial		Pipelines	Farm	Levy Change
$515,182	Occupied	Occupied	Vacant Land	Occupied	Occupied	and Total
Chamberlain Township, 5454						
General	0.01002462	0.01002462	0.00701723	0.01597824	0.00250616	5.00000000%
2017 Active CVA from Table 5	$20,838,925.00	$543,975.00	$20,925.00	$19,447,750.00	$4,028,550.00	$44,880,125.00
Total Taxation	$208,902.30	$5,453.14	$146.84	$310,740.82	$10,096.19	$535,339.29
Asset Levy based on 1% of the 5% increased Levy						**$5,353.39**

Projected 2018 Tax Rates Summary						
2017 Levy	Residential	Commercial		Pipelines	Farm	Levy Change
$540,941.10	Occupied	Occupied	Vacant Land	Occupied	Occupied	and Total
Chamberlain Township, 5454						
General	0.01001823	0.01001823	0.00701276	0.01596806	0.00250456	5.00000000%
2018 Active CVA from Table 5	$22,230,650.00	$568,350.00	$29,950.00	$20,164,500.00	$4,596,900.00	$47,590,350.00
Total Taxation	$222,711.76	$5,693.86	$210.03	$321,987.95	$11,513.21	$562,116.82
Asset Levy based on 1% of the 5% increased Levy						**$5,621.17**

Projected 2019 Tax Rates Summary						
2018 Levy	Residential	Commercial		Pipelines	Farm	Levy Change
$567,988.16	Occupied	Occupied	Vacant Land	Occupied	Occupied	and Total
Chamberlain Township, 5454						
General	0.01003519	0.01003519	0.00702463	0.01599509	0.00250880	5.00000000%
2019 Active CVA from Table 5	$23,622,375.00	$592,725.00	$38,975.00	$20,881,250.00	$5,165,250.00	$50,300,575.00
Total Taxation	$237,055.02	$5,948.11	$273.78	$333,997.47	$12,958.58	$590,232.97
Asset Levy based on 1% of the 5% increased Levy						**$5,902.33**

Financial Impact Summary
The Financial implications (estimated) are presented in the attachments to this report. It is important to recognize that based upon the Plan, the amount of funds available through the current 10 year Capital Budget process may not sufficient to sustain the current level of service. Staff must continue to collectively work together to accommodate the financial and technical requirements of this plan, including taking advantage of any grant funding programs that may be available today or in the future.

Strategy Considerations

The following strategies should be considered to implement the Asset Management Plan for the Township of Chamberlain.

1. **Strategic Use of Debt** within a comfortable annual repayment limit.
   Debt should be considered for large capital projects that are long term in nature and that benefit future taxpayers, thereby spreading the cost over the users.
   A simple debt management policy would be considered an asset and recommended.

   Long Term Debt
   A Loan Program to be considered would be the program by IO.
   Infrastructure Ontario has a Loan Program that provides long-term financing to eligible public sector clients to help renew infrastructure and deliver value to customers and residents.[3]

[3] Internet - http://www.infrastructureontario.ca accessed on January 20, 2017.

Eligible Borrowers include public sector organizations such as municipalities. Lending Rates for Municipalities are based on the credit strength of each sector.

Indicative Lending Rates as of 20/01/2017

Indicative Lending Rates as of			
Term	**Construction**	**Serial**	**Amortizer**
1 Month	1.51%	-	-
5 Year	-	1.98%	1.98%
10 Year	-	2.61%	2.63%
15 Year	-	3.01%	3.06%
20 Year	-	3.28%	3.35%
25 Year	-	3.45%	3.53%
30 Year	-	3.54%	3.63%

Strategy Considerations Cont'd

2. **Use of Grants** will be necessary to implement some components of the Township of Chamberlain Asset Management Plan. A greater effort in advocating for funds and meeting with government officials to "pitch" proposals should be given priority. A strong leadership needs to be appointed to advocate.
3. An Asset Levy or Asset Reserve could be implemented that would earmark a percentage increase over time or a fixed amount annually for asset replacement, construction or rehabilitation.
    a. An asset levy could be created as a percentage of the levy increase to increase by that percentage increment each year. For example using Table 6 with a proposed overall levy increase of 5%, a portion of that levy increase earmarked for assets of 1.0% of the total municipal levy in 2017 would be $5,353.39,
        2018 = $5,621.17
        2019 = $5,902.33, and so on.
    b. The alternative would be to fix an amount annually spread over the 10 year capital plan period. The amount should be in relation to the infrastructure gap and earmarked according to the replacement of priority assets in the plan. The investment income derived from the amount could also be earmarked to the asset reserve.

Further Goals

After thorough review of the Asset Management Plan, financial strategies, programs and service levels the main strategic goals the Municipality has adopted are:

Strategic Goals, in no particular order:

- Identifying existing deficiencies in the current municipal infrastructure and adjusting plans and strategies accordingly.
- Improved record keeping of all betterments, rehabilitations, inspections, etc. relating to the infrastructure.
- Creation of a debt management plan.
- Seek out investment opportunities to maximize investment potential – See Appendix D for ONE Investment information.
- A greater effort into the research and advocating for funding opportunities at all levels of government and within the Private Sector.
- A greater effort into seeking partnerships and opportunities and building as a regional area.
- Commitment to stewardship and ensuring long-term financial sustainability.

Barriers & Challenges

After thorough review of the Asset Management Plan, financial strategies, programs and service levels the barriers and challenges the Municipality has identified are:

- Adopting long-term thinking; planning beyond the operational budget.
- Financial impact to the residents of the municipality.
- Tax levy affordability overall.
- Stagnant development opportunities, lack of growth and population to sustain infrastructure.
- Reliance on one industry to fund assessment base.
- Competitive funding program applications.
- Cost of construction in comparisons to other areas of the Province.
- Staff resources and expertise to implement more technical strategies.
- Difficulty building a plan to include all assets such as shared assets. For example fire department and boundary roads.
- Rethinking infrastructure – adapting new techniques and coming up with strategies that can be sustainable and affordable.
- Differing valuations, technical ratings, condition ratings, standards, etc.

Conclusion

The Township of Chamberlain has provided good stewardship and invested in reserves. Although, today that investment should be thoroughly reviewed and a financial plan and strategy formalized for the future sustainability of the Municipality. It will become more challenging moving forward. It will also be a challenge to plan for the long-term and adopt a new culture of forward-thinking and innovation.
A debt management plan is necessary and seeking alternative investment options would be beneficial.

As with many small, rural municipalities, they are disadvantaged by limited revenue sources and stagnant development opportunities. The infrastructure deficit is similar to all other municipalities in Ontario.

The municipality must embrace the principles of Asset Management and commit to the long term planning with clear, strong leadership from council and keep the public apprised of their efforts and seek public input to ensure the preferred path.

Strategies should include a stronger voice in advocating funding for small municipalities and development of partnerships with neighbouring municipalities, organizations and, the private sector. Economic strengths, revenue generating opportunities and cost savings through shared service arrangements will be necessary to preserve a quality of life and sustainability for the regional area.

Levels of service will need to be revisited and greater emphasis on performance measurement may be necessary and could prove to be beneficial if resources are available to conduct proper measurements.

In general the municipality must continue with their good stewardship efforts by effectively and efficiently managing existing infrastructure and that may require a significant change in organizational culture.

Appendix A

Asset Management Breakdown & Strategy

1. Hard Topped Roads
2. Unpaved Roads
3. Culverts & Drainage
4. Bridges & Large Structures
5. Equipment
6. Land & Buildings

State of Local Infrastructure & Asset Management Strategy

Hard Topped Roads

Asset Management Summary

Asset	**Hard Topped Roads**
Inventory	7.8 lane km or surface treated surface, ditched. Wabewawa Road
Anticipated Asset Life Cycle	Useful life is 15 years for surface treated topped roads.
Integrated	With other buried assets located in the utility corridor such as water, sewer, storm sewers, hydro, telephone, natural gas and cable. May also affect street lighting, traffic signals and sidewalks
Rehabilitation and Replacement Criteria	Condition Rating Index is a condition rating between 0 and 5 which measures defects in the pavement or surface treatment. A condition rating equal to 5 is a new pavement/surface treatment and a condition rating equal to 0 is pavement/surface treatment that is impassible. The threshold point of rehabilitation or reconstruction for Township roads: between 3-5 is rehabilitation, below 2 – reconstruction. At December 2017 the average condition of all hard topped roads were 4.
Rehabilitation and Replacement Strategies	Rehabilitation and Replacement strategies will be based on the condition rating, road classification, rural or urban, benefit/cost ratio and specific strategies implemented. Within the 10 year capital plan, the strategy has been identified with options for consideration and planning.
Life Cycle Consequence	Under funding pavement/surface treatment rehabilitation results in more condition ratings to fall below a 2 and results in escalading construction costs. It may also affect level of service, cost more for maintenance and increase risk and liabilities.
Integrated Asset Priorities	Pavement/surface treatment rehabilitation forecast is compared to underground utility forecasts. In general a rehabilitation project drives the replacement of underground water and sewer infrastructures if the infrastructure is near the end of its life cycle.
Corporate/Consulting Reports on subject	
Estimated Cost per year for Strategy described	No cost within 10 year capital plan. Ongoing maintenance recommended preserving asset.
Other information or reference materials	N/A

Unpaved Roads

Asset Management Summary

Asset	**Unpaved Roads**
Inventory	137 lane km of gravel surface, 4.2 lane km of earth lane surface designated seasonal road maintenance.
Anticipated Asset Life Cycle	Infinite – earthen and gravel roads are treated as operating expenses and not included in the Capital Plan expenses.
Integrated	With other buried assets located in the utility corridor such as water, sewer, storm sewers, hydro, telephone, natural gas and cable. May also affect street lighting, traffic signals and sidewalks
Rehabilitation and Replacement Criteria	The OGRA strategy for Gravel roads is to apply 75mm every 3-5 years depending on the AADT of the road.
Rehabilitation and Replacement Strategies	The Municipal Strategy for Gravel roads is to apply a minimum of 2,000 cubic yards at a rate of approximately 300 cubic yards per kilometer of every road in need over the next 10 years depending on the AADT, condition of the road and the benefit/cost ratio. After 10 years the municipal strategy could then be reduced to a maintenance strategy of approximately ½ the required aggregate. A 10 year maintenance plan, funded through the annual operating budget is recommended and should be attached to this plan.
Life Cycle Consequence	Under funding gravel rehabilitation results in escalading re-construction costs and affects level of service with increased risk and liabilities.
Integrated Asset Priorities	Gravel road rehabilitation forecast is compared to underground utility forecasts. In general a gravel road rehabilitation project drives the replacement of underground water and sewer infrastructures if the infrastructure is near the end of its life cycle.
Corporate/Consulting Reports on subject	n/a
Estimated Cost per year for Strategy described	2014 – 2,000 cubic yards @$18.00 = $36,000 2015 – 36,720 2016 – 37,454 2017 – 38,203 2018 – 38,967 2019 – 39,747 2020 – 40,542 2021 – 41,353 2022 – 42,180 2023 – 43,023 2024 – 1,000 cubic yards @$22.00 = $22,000
Other information or reference materials	n/a

Culverts & Drainage

Asset Management Summary

Asset	**Culverts**
Inventory	Culverts of various sizes under 3 meters in diameter
Anticipated Asset Life Cycle	Culverts • Wood – 25 years • Steel – 50 years • Plastic – 50 years • Concrete – 50 years Smaller drainage systems such as culverts are treated as operating expenses and not included in the Capital Plan expenses.
Integrated	May be integrated with road resurfacing or road widening projects however generally are not integrated with other infrastructures.
Rehabilitation and Replacement Criteria	Criteria for prioritizing include level of service and traffic volumes, safety and to preserve infrastructure.
Rehabilitation and Replacement Strategies	Culverts are installed as required and many structures have no historical installation information to determine anticipated life cycle. Factors affecting replacement are soil types, material installed, amount of water, etc. There is no capital plan consideration for general culverts under 3 meters in diameter. This culvert replacement plan is based on forecasted requirements through inspection and rating and funded through the annual operating budget.
Life Cycle Consequence	Under funding culvert replacement results in escalading re-construction costs and affects level of service with increased risk and liabilities.
Integrated Asset Priorities	Culvert replacement is compared to road rehabilitation or construction projects and plans. In general culvert replacements are considered when undertaking road rehabilitation/construction projects to determine if the infrastructure is near the end of its life cycle.
Corporate/Consulting Reports on subject	Updated culvert inventory should be attached to this plan.
Estimated Cost per year for Strategy described	Typically an amount of $2,000-$3,000 should be estimated annually for the replacement of culverts per year in the operational budget.
Other information or reference materials	n/a

Bridges & Large Structures

Asset Management Summary

<table>
<tr><th>Asset</th><th>Bridges & Large Structures</th></tr>
<tr><td>Inventory</td><td>4 bridges and 7 large structures</td></tr>
<tr><td>Anticipated Asset Life Cycle</td><td>Bridges
Wood – 25 years
Steel – 75 years
Concrete – 75 years
Culverts
Wood – 25 years
Steel – 50 years
Plastic – 50 years
Concrete – 50 years</td></tr>
<tr><td>Integration</td><td>May be integrated with road resurfacing or road widening projects however generally are not integrated with other infrastructures.</td></tr>
<tr><td>Rehabilitation and Replacement Criteria</td><td>Criteria for prioritizing include level of service and traffic volumes, safety and to preserve infrastructure.
Bi-annual visual inspections of bridges and large structures are completed and detailed surveys are completed as required. Bridge and structure components are evaluated and tested according to Ontario Regulation 104/97 and in accordance with the Public Transportation and Improvement Act; Ontario Structure Inspection Manual.</td></tr>
<tr><td>Rehabilitation and Replacement Strategies</td><td>As identified in the most current Ontario Structure Inspection Summary Report – TSI Inc. 2016.</td></tr>
<tr><td>Life Cycle Consequence</td><td>Bridge and culvert life cycles will be reduced, level of service is lowered and safety is compromised.</td></tr>
<tr><td>Integrated Asset Priorities</td><td>N/A</td></tr>
<tr><td>Corporate/Consulting Reports on subject</td><td>Updated all asset values for all bridges and large structures, identified useful life of structures and provided summary of maintenance needs.</td></tr>
<tr><td>Estimated Cost per year for Strategy described</td><td>
<table>
<tr><th></th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td>Bridges</td><td>29,000</td><td></td><td>30,000</td><td>50,000</td><td>55,000</td><td>1,780,000</td><td>422,000</td><td>980,000</td><td></td></tr>
<tr><td>Culverts</td><td>54,000</td><td>32,000</td><td></td><td></td><td></td><td></td><td>185,000</td><td></td><td>370,000</td></tr>
</table>
</td></tr>
<tr><td>Other information or reference materials</td><td>Ontario Structure Inspection Summary Reports – TSI Inc.2016. Asset Class – Bridges – List of Projects Report Appendix C</td></tr>
</table>

Equipment

Asset Management Strategy

<table>
<tr><th>Asset</th><th>Vehicles and Equipment</th></tr>
<tr><td>Inventory</td><td>1 light duty vehicle
2 heavy duty vehicle
4 pieces of heavy equipment</td></tr>
<tr><td>Anticipated Asset Life Cycle</td><td>Varies depending on vehicle/equipment type. See report in appendix C.</td></tr>
<tr><td>Integrated</td><td>With technical advances and financial plans, environmental regulations, operational changes, service increases or decreases.</td></tr>
<tr><td>Rehabilitation and Replacement Criteria</td><td>Lifecycle cost analysis considering depreciation, fuel, repairs, insurance, downtime costs, etc. These factors will identify optimal replacement year for vehicle/equipment assets.</td></tr>
<tr><td>Rehabilitation and Replacement Strategies</td><td>Review usage to warrant replacement, repair costs should not exceed 40% of the replacement costs. Review lease, seasonal rental opportunities, refurbishing strategies and possibility of contracting services to third party.</td></tr>
<tr><td>Life Cycle Consequence</td><td>Cost per km increases, increased downtime require more spare units or work schedules to be lengthened increasing manpower costs, loss or production.</td></tr>
<tr><td>Integrated Asset Priorities</td><td>N/A</td></tr>
<tr><td>Corporate/Consulting Reports on subject</td><td>Internal Review</td></tr>
<tr><td>Estimated Cost per year for Strategy described</td><td>
<table>
<tr><th>Capital Plan</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th><th>2026</th><th>2027</th></tr>
<tr><td>Replacement</td><td></td><td></td><td></td><td></td><td>127,182</td><td>365,171</td><td>179,108</td><td>307,468</td><td>31,669</td><td></td><td>4,032</td></tr>
<tr><td>Rehabilitation</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Other information or reference materials</td><td>Asset Condition Summary
Asset Class – List of Projects – Appendix C</td></tr>
</table>

Land & Buildings

Asset Management Strategy

Asset	**Corporate Facilities**
Inventory	4 Buildings, 1 Waste Disposal Site, Waste Monitoring Well, Park Equipment, Land
Anticipated Asset Life Cycle	Life cycles can vary from 15 to 50 + years. A roof replacement would be in the 25-30 year range, HVAC in the 25 year range and a building super structure upwards of 50 years. These life cycles assumed adequate maintenance is provided throughout the course of the component life.
Integrated	Individual asset components are reviewed and consideration is given to minimize the disruption of operations to a given asset over time.
Rehabilitation and Replacement Criteria	Adequate maintenance shall be provided throughout the course of the component life, thus minimizing the need for replacement.
Rehabilitation and Replacement Strategies	Annual inspection and evaluation will provide asset condition and identify individual components and prioritize replacement based on actual condition, and its point in time of its life cycle. Facility roof and HVAC system inventories are generally the most important components to manage and as such annual inspections should be completed. These assets will be replaced or upgraded to meet life cycle, industry, technological and safety standards. Upgrading of ingress/egress points may also be required for many facilities as new requirement under the Accessibility for Ontarians with Disabilities Act (AODA) have set minimum accessibility standards. Along with maintaining and protecting the municipal facility assets, any upgrade program will also include the implementation of energy efficient systems and equipment.
Life Cycle Consequence	Increased deterioration of building and properties, health and safety concerns, inefficient operation, higher operating costs, accelerated depreciation of assets.
Integrated Asset Priorities	Replacement is based on actual condition, the point in time within its life cycle and the availability to complete the replacement with minimal disruption to the program/service delivery within the asset.
Corporate/Consulting Reports on subject	n/a
Estimated Cost per year for Strategy described	No costs for land and buildings within the 10 year capital plan. It is recommended the buildings and components be inspected to determine any capital needs and plan accordingly.
Other information or reference materials	Accessibility for Ontarians with Disabilities Act – Ministry of Community and Social Services http://www.mcss.gov.on.ca/en/mcss/programs/accessibility/index.aspx

Appendix B
Culvert Inventory

Appendix C

Asset Class
List of Projects Report

Vehicles

Asset Name	Current NBV	Replacement New 2017	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
2013 Chevrolet Silverado ½ Ton	$12,309	$25,000									$31,669		
1996 JCB Backhoe/ Loader	$8,846	$113,000					$127,182						
1988 JD 70D Excavator	$10,272	$150,000							$179,108				
2000 Plow Truck	$0												
**2007 Tandem Axle Float	**$7,000	**$25,000							**$29,851				
2007 CAT Grader	$152,929	$315,000						$365,171					
2011 International Workstar	$103,250	$250,000								$307,468			
*Riding Mower	*$2,448	*3,000											*4,032
Totals	**$287,606**												

*Riding Mower for Rec Dept $2,448 brings total to $290,054**Not included in statements

Roads

Asset Name		2017	2018	2019	2020	2021	2022	2023	2024	2025
Wabewawa Road	Surface Treatment									
Various Unpaved Roads	Gravel *	$38,203	$38,967	$39,747	$40,542	$41,353	$42,180	$43,023	$43,883	$44,761
	*$18/yrd	**2,000 yrds/year + 2% inflation**								

Bridges (based on 2016 reports)

Asset Name	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lyons Bridge 47-115	$5,000				$15,000		$62,000		
Bailey Bridge 47-114	$8,000			$20,000			$40,000	$980,000	
Aidie Creek Bridge 47-112	$9,000			$30,000			$320,000		
Krugerdorf Bridge 47-99	$7,000		$30,000		$40,000	$1,780,000			
Totals	**$29,000**		**$30,000**	**$50,000**	**$55,000**	**$1,780,000**	**$422,000**	**$980,000**	

Large Culverts (based on 2016 reports)

Asset Name	2017	2017	2018	2019	2020	2021	2022	2023	2024	2025
Blackburn #4	$4,000									$185,000
Crocodile Creek #5	$1,000	$1,000								
Crocodile Creek #6	$4,000							$185,000		
West Road #2	$4,000	$32,000								
Crocodile Creek #1	$4,000		$32,000							
Blackburn #3	$4,000									$185,000
Totals	**$21,000**	**$33,000**	**$32,000**					**$185,000**		**$370,000**

Buildings

Asset Name	NBV	Replacement New 2017	2018	2019	2020	2021	2022	2023	2024	2025
New Garage	$251,784	$413,000								
Old Garage	$0	$0								
Sand/Salt Shed	$13,118	$114,000								
Storage Shed	$3,685	$0								
Rink/Ball Storage	$11,508	$31,000								
Field Lights	$0	$80,000								
Municipal Hall/Office	**$75,837**	**$350,000**								
Septic and Well	**$955**	**$30,000**								
Landfill Building	**$798**	**$10,000**								
Total	**$357,685**	**$1,028,000**								

* Landfill monitoring of wells $1,358 brings total to $359,043

Appendix D
Supporting Information

One Investments

AMO - Investments and Oversight

ONE Investments is a pooled investment program that offers short term or long-term investment options for municipalities. No matter whether your municipality is investing for the short-term or the long-term, The One Investment Program offers a variety of portfolio options to suit the needs of every Ontario municipality.

For more information on the ONE investment program and a list of participants refer to:

https://www.las.on.ca/Services/Investments.aspx

For portfolio information refer to:

https://www.las.on.ca/Services/Investments/The-Program/Portfolios/Money-Market.aspx

https://www.las.on.ca/Services/Investments/The-Program/Portfolios/Bond.aspx

Bridge Condition Index (BCI)

All bridges have a natural life span. To keep bridges in a safe condition, maintenance and upkeep are scheduled based on inspection results, age, location and the type of bridge. Strategically scheduling bridge maintenance to ensure that repairs and upkeep are done at the most optimal time allows municipalities to ensure that bridges are safe for their entire lifespan, and that the money for repairs is wisely spent.

Every bridge in Ontario must undergo a rigorous inspection every two years by a trained inspector who is either a professional engineer or under their direction. The inspector reviews and rates each bridge component. These ratings are used in determining the bridge's current value.

The BCI rating is a planning tool that helps the Municipality schedule maintenance and upkeep. The BCI is not used to rate or indicate the safety of a bridge.

The result is organized into ranges from 0 to 100. Immediate action is taken to address any safety concerns.

Good - BCI Range 70 -100
For a bridge with a BCI greater than 70, maintenance work is not usually required within the next five years.

Fair - BCI Range 60 -70
For a bridge with a BCI between 60 and 70 the maintenance work is usually scheduled within the next five years. This is the ideal time to schedule major bridge repairs from an economic perspective.

Poor - BCI Less than 60
For a bridge with a BCI rating of less than 60, maintenance work is usually scheduled within approximately one year.

To calculate the BCI rating, the current value is divided by the replacement cost of the bridge. The replacement value is based on the cost to reconstruct a new bridge.

For example:
Current value = $700,000
Replacement cost = $1,000,000

$$BCI = \frac{\text{Current Value}}{\text{Replacement Cost}} \times 100$$

$$= \frac{700,000}{1,000,000} \times 100$$

$$= 70$$