

**Township of Enniskillen**

**Asset Management Plan**

**2014**

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## **Introduction**

The Township of Enniskillen is a rural municipality located in central Lambton County with a population of 3,178 people. The Township was the site of the first commercial development of oil in North America. Vestiges of the early oil industry remain in the municipality. Today the primary economic activity is row crop farming mixed with livestock production. The proximity of the petro chemical industry along the St Clair River provides employment for many residents of the Township. The hamlets of Marthaville and Oil City are located within the Township of Enniskillen.

The Township of Enniskillen is responsible for providing services to the residents of the municipality in the following areas:

Roads and Bridges

Potable Water Distribution

Sewer Collection and Treatment for the hamlet of Oil City

Municipal Drainage

The purpose of this asset management plan is to help preserve and enhance the quality of life in Enniskillen Township by managing the Township's assets in an efficient and sustainable manner.

The asset management plan will provide an understandable format to develop operating, maintenance and financial plans that support the level of service approved by the Township Council.

The 2014 Asset Management Plan will incorporate the following assets: roads, bridges, and linear assets which include municipal waterlines and sewer lines. Data has been drawn from the fixed asset inventory of the Township of Enniskillen. It has been supplemented by replacement cost values developed from 2013 contracts and other reliable sources.

The goal will be to update the information in the plan on an annual basis with the inclusion of buildings, vehicles and other fixed assets under the control of the municipality. The inclusion of the remaining fixed assets in 2014 will necessitate an update in the projections. A 60 year projection has been obtained with the use of the asset modeling software. The modeling software projects the revenue required to address the projected costs for each asset group.

In examining the assets of the municipality, assumptions have been incorporated into the projections. Current technologies and standards have been applied in the projections. It should be clearly understood that over time changes take place in public expectations of service levels, regulatory standards, infrastructure materials, and construction methods. These changes may have dramatic impacts on the cost of the services provided. As a result one must accept that projections decades into the future will only provide benchmarks to the actual future capital expenditures.

## State of Local Infrastructure

This section is broken down by asset describing the state of the infrastructure for roads, bridges, water and sewer lines. The assets are evaluated using available data drawn from the municipal asset inventory. Incorporated into this inventory are the historical costs, current replacement values as well as information on the age, anticipated life, and condition ratings.

## Roads

The Enniskillen Township road system consists of 273 kilometers of roads. The chart below provides an inventory of the clay, gravel, surface treated and asphalted roads within the Township.

Asset Type	Quantity lane km	Quantity km	Historical Cost
<b>Gravel/Clay/Stone</b>	<b>306</b>	<b>153</b>	<b>269,788</b>
<b>Surface Treated</b>	<b>124</b>	<b>62</b>	<b>1,881,747</b>
<b>Paved</b>	<b>116</b>	<b>58</b>	<b>2,818,487</b>

The Township of Enniskillen road system has been listed by segment from intersection to intersection. Attributes such as condition, age and replacement costs have been assigned to each road segment. Gravel, clay and stone roads are included in the inventory but do not form part of the road condition index.

## Pavement Condition

The future maintenance, rehabilitation and renewal programs for the roads have been generated from the pavement condition index. An analysis of the road condition will be undertaken every two years. More frequent inspection will take place where road segments are observed to be in greater distress. The pavement condition index has been utilized from Guide SP-022 Flexible Pavement Condition Rating, Guidelines for Municipalities.

The roadway rating system provides a useful assessment of the structural condition of the road surface. Clay, stone and gravel roads are included in the inventory but do not form part of the road condition index. The road segments are compiled into 5 categories which are excellent, good, fair, poor and very poor. Ninety-one per cent of the asphalt roads are listed as good with 9% listed as fair. 100% of the surface treated roads have been rated as good.

Asset	Asset Age	Age as a % of Useful Life	Average Condition
Surface treatment	23.93	39.9	Good
Paved	23.27	38.78	Good

## Bridges

The Township of Enniskillen is responsible for the maintenance, repair and replacement of 57 bridges with spans of three meters or greater. The Township is also responsible for 117 bridges with spans less than three meters but over \$5000 in replacement value. These bridges do not form part of this asset management plan.

Ontario Regulation 104/97 requires municipalities to undertake inspections every two years of all bridges greater than three meters in span. The qualified engineer inspecting the structures has reviewed the structural integrity in accordance with the Ontario Structure Inspection Manual. The report has been generated based on the historic bridge inspection formula. The 2014 bridge inspections will incorporate the revised inspection formula which will be incorporated into the next version of the asset management plan.

The following table provides the number of bridges over three meters in span by bridge type as well and estimates of the 2013 replacement costs.

Bridge Type	Number	Historical Cost	Replacement Cost
Steel Bridges	11	\$1,925,519	\$5,960,000
CSP Culverts	12	\$ 59,638	\$1,637,000
Concrete Bridges	8	\$1,498,313	\$3,820,000
Concrete Culverts	26	\$2,705,077	\$5,235,000
Total	57	\$6,188,547	\$16,652,000

The following table provides an overview of the average age, age as a percentage of useful life and the average condition rating for bridges within the Township.

Bridge Type	Average Age	Age as % of Useful Life	Condition
Steel Bridge	57	77	Fair
CSP Culverts	36	91	Good
Concrete Bridges	36	48	Good
Concrete Culverts	23	31	Good

## Water Distribution

The Township of Enniskillen operates a municipal water distribution system under license #028-101 issued by the Ministry of Environment. The Township strives to provide a safe and reliable water system. The system provides potable water to 1332 services located in the Township of Enniskillen, the Township of Brooke-Alvinston, the City of Sarnia, the Township of St Clair and the Town of Plympton-Wyoming. In addition potable water is sold to the Village of Oil Springs and the Township of Dawn-Euphemia. These two municipalities operate licensed water distribution systems providing potable water to the residents of their communities. All waterlines in the Enniskillen distribution system are plastic and most are less than 25 years of age.

### Water Pipelines- State of Local Infrastructure

<b>Diameter (mm)</b>	<b>Meters</b>	<b>Historical Cost</b>	<b>Replacement Cost</b>
250	11,569	\$479,385	\$1,272,884
225	60	2,172	6,960
200	13,079	399,895	1,118,254
150	118,436	3,436,565	8,685,616
100	159,015	2,454,454	7,187,753
50	44,739	345,994	1,353,608
<b>Total</b>	<b>346,898</b>	<b>\$7,117,465</b>	<b>\$19,582,590</b>

## Sewer Collection

The Township of Enniskillen operates a sewage system for the hamlet of Oil City. This primary treatment system has 104 services with wastes treated in a single cell lagoon. The sewer system was constructed in 1974 and consists of 2497 meters of 200 mm diameter plastic pipe. The pumping station was refurbished in 2006 with the inclusion of new pumps and new automated control systems. The sewage is pumped through 1189 meters of 100 mm ductile steel force main into the single cell sewage lagoon located west of the hamlet. The replacement cost of the sewer lines does not include rehabilitation of the associated roads. The historical costs include road rehabilitation.

### Sewers

<b>Diameter (mm)</b>	<b>Meters of pipe</b>	<b>Historical Cost</b>	<b>Replacement Cost</b>
100	1189	69,900	71,388
200	2497	444,481	461,902

## Desired Levels of Service

The identification of the desired levels of service for each asset is an important component to the asset management plan. The service levels are indicators to outline whether the infrastructure meets the expectations of the community.

### Roads

The physical condition of the roads is the primary indicator used by the Township to determine the satisfaction with the road system. The Township maintains several types of road surfaces including asphalt, surface treatment, gravel, stone and clay. The discussion of service levels is restricted to the asphalt and surface treated roads. The service level concerning roads focuses on the physical condition rating of the road surface. The municipality attempts to maintain all roads above the poor condition rating.

Level of Service	Target	Performance
Maintain an average road condition of Good	Good	Good
Maintain 100% of roads above "Very Poor" condition	100 %	100%

### Bridges

The condition rating system for bridges has been established by the provincial government. The rating includes structural soundness, bridge condition and safety. It should be noted that bridges will be permitted to fall into the poor rating for a period of time until replacement.

Level of Service	Target	Performance
Maintain an average bridge condition of Good	Good	Good
Maintain 100% of bridges and major culverts above Poor	100%	74%

### Water

Water is an integral part of each household. The community expects that the quality of water meets water quality standards and that the supply is reliable. The indicators selected for water address the number of boil water orders issued and the number of water main breaks.

Level of Service	Target	Performance
Number of Boil Water Orders	0	0
Number of water main breaks per year	<5	3

### Sewer

Sanitary sewers are available only to the hamlet of Oil City. Residents expect that sewage is moved and treated with no main line backups and no untreated releases into the environment. The indicators for the sewer system address the number of backups in the sanitary sewer main and the sewer main breaks.

Level of Service	Target	Performance
Number of sewer backups	0	0
Number of sewer main breaks	0	0

### **Asset Management Strategy**

The Ministry of Infrastructure bulletin describes an asset management strategy “as the set of planned actions that will enable the assets to provide the desired levels of service in a sustainable way, while managing risk, at the lowest cost (e.g. through preventable action.)” The following outlines the asset management strategy to be undertaken by the Township of Enniskillen.

## **Roads**

### **Non Infrastructure**

The road monitoring program undertaken by the municipality promotes identification of deficiencies developing in the municipal roads. Half load restrictions are put in place on selected roads deemed to be susceptible to damage to traffic loading during the spring freeze/thaw events. Municipal policy normally requires (1) that directional boring of the road for the installation of small diameter drains and water services. Although more costly this reduces the long term impact to the road surface and base.

(2) that water mains and municipal drains be installed off the travelled portion of the roads to reduce the potential of additional costs during future road construction.

### **Maintenance**

Maintenance of the asphalt and surface treated roads consists primarily of spray patching surfaces to reduce the impact of the freeze thaw cycle on the surfaces.

### **Renewal/Rehabilitation**

#### **Surface Renewal**

Historically new riding surfaces have been applied to the old asphalt and surface treated surfaces. This may include the use of fibremat at the time of the application of the asphalt to address surface cracking on asphalted roads. A single layer of surface treatment may be used on surface treated roads.

Where sufficient asphalt thickness exists on a road surface “in place” recycling of the asphalt layer will be incorporated.

### **Replacement**

Total reconstruction of a roadway occurs when the application of the maintenance strategies are no longer appropriate either due to the road condition or the costs.

### **Disposal**

At this time there is little likelihood of any portion of any municipal road being incorporated into the county or provincial road systems. The Township has no current plans to close and sell any open public road.



## **Expansion**

There are no development plans which will lead to the increase of the municipal road system. Expansion by downloading from the County is unlikely and there are no provincial roads within the Township of Enniskillen.

## **Bridges**

### **Non Infrastructure**

Regular monitoring of the bridge conditions will continue to be undertaken by the public works staff.

### **Maintenance**

The biannual bridge inspection identifies the primary maintenance projects for the structures. These inspections could recommend removal of vegetation, repairs to erosion control works and minor concrete repairs.

### **Renewal/Rehabilitation**

Minor rehabilitation includes the replacement of bridge bearings, water proofing, replacement of joint seals, resurfacing and barrier repairs.

Major rehabilitation includes more extensive work such as deck replacement, replacement of barriers and recoating structural steel.

### **Replacement**

Replacement of a bridge takes place when it is determined that the bridge is no longer viable either due to the maintenance costs or the bridge's condition. The timing of the replacement of the bridge will take into consideration the associated risk of the failure of the bridge. The Township has replaced corrugated steel bridges with concrete bridges to extend the replacement time of the affected bridges.

### **Disposal**

The Township has no plans in place to reduce the number of bridges in the municipality. The Township has restricted access to one low volume road due to the condition of the bridge. A second site is currently under consideration for this same policy. Consideration of not replacing these two bridges is a clear option although this decision has not been made.

### **Expansion**

There are no anticipated developments that would increase the number of bridges within the Township road system. Future bridge replacements will be subject to different flow rate standards requiring larger capacity structures. Roads subject to pedestrian and bicycle traffic may require the addition of wider lane widths.

## **Water**

### **Non infrastructure**

The municipality monitors water loss within the distribution system by daily reading of the flow at primary meters and analyzing water loss during the water billing cycle. It is anticipated that this monitoring will reduce operating costs by identify breaks earlier and reduce unbilled water usage. Staff will continue to be provided training related to changes in technology for operating and maintaining the water distribution system with the goal of incorporating procedures that reduce water loss and extend the life of the infrastructure.

### **Maintenance**

The regular maintenance of the water distribution system consists of visual monitoring for leaks, flushing, exercising valves and painting of fire hydrants. Repairs are made to meters and shut offs as well as water main valves. Corrosion to metal parts of valves and water service shutoffs may require incorporating methods to reduce corrosion.

### **Renewal/Rehabilitation**

The municipal water system consists of plastic waterlines most less than 25 years of age. The Township will continue to monitor the location and the number of waterline breaks in the distribution system. The Township will incorporate the current renewal and rehabilitation techniques to control the unbilled water usage in the distribution system. As trenchless technology is refined the lining of waterlines may become a viable option.

### **Replacement**

The expected life of the waterlines indicates that replacement is not anticipated for 50 years. The replacement of any portion of the water distribution system will take place based on the amount of waterline breakage and the amount of water loss (unbilled usage). Efforts will be made to incorporate current replacement practices at that time.

### **Disposal**

Water pipelines located in neighbouring municipalities could be assumed and operated by those municipalities. No discussions are currently underway on this subject.

### **Expansion**

There is limited potential for expansion of the water distribution system as access to the system has been provided to most properties within the Township. There is little potential for expansion of the water system resulting from land development taking place within the Township.

## **Sewer**

### **Non infrastructure**

The Oil City sewer system was constructed in the travelled portion of the roads. There will be coordination of the maintenance of manholes and sewer lines when road rehabilitation takes place. The Township will monitor sewer main backups, failure of service connections and the failure of the sewer mains.

The sewer flow is metered at the pump station. Periodically due to increased sewer flow the municipality will undertake inspections to insure that sump pumps and other surface water flow is not connected to the sewer system.

The Township will incorporate video inspection when it is determined that there is potential for blockage of the mains or deterioration of the mains or to find illegal storm water connections.

### **Maintenance**

A maintenance program is in place to undertake visual inspection of manholes.

Flushing of the sewer mains is undertaken when it is determined that there is a potential for blockage of the mains.

### **Renewal/Rehabilitation**

The Township will incorporate the current practices in place at the time of the rehabilitation or replacement of the sewer mains. As trenchless technology is refined rehabilitation may incorporate relining of the mains. The relining or replacement of the sewer mains will be coordinated with road reconstruction in the hamlet.

### **Disposal**

There is no consideration of closing or transferring the ownership of the sewer system.

### **Expansion**

Oil City is a low growth area with little potential for expansion of the sewer system. Any development will be subject to the design limitations to the single cell lagoon.

## **Financing Strategy**

The asset management plan must be incorporated into the financial planning of the Township. This will provide information to the Council as to the cost implications of sustaining the physical assets of the Township.

It should be noted that the financial costs of the water and sewer systems are to be funded through user fees. The costs associated with the roads and bridges will generally be funded by municipal property taxes. The Township of Enniskillen receives Gas Tax revenue provided by the Government of Canada which has been directed into the maintenance and reconstruction of roads and bridges.

Although incremental funding of capital projects is being made available by the provincial and federal governments there is no consistency in this financial support.

**Water**

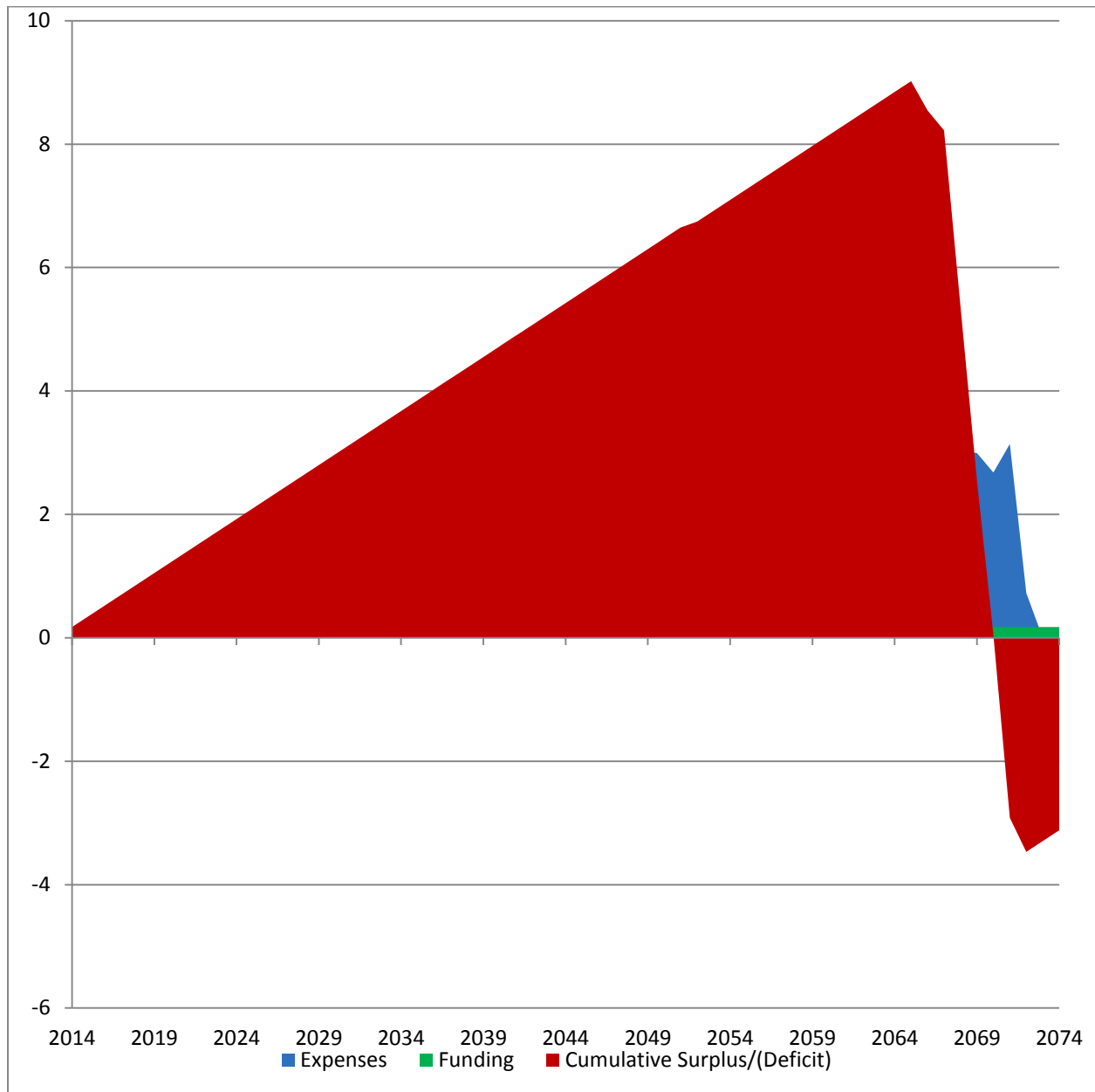
A sixty year projection of the costs associated with the capital replacement of the water distribution system operated by the Township of Enniskillen has been prepared based on 2013 estimated costs. The capital replacement projections are based on the projected 80 year life of the water lines.

During the period of 2044-2053 it is estimated that \$78,700.00 would be required for capital replacement. During the period of 2064-2073 the remaining water distribution infrastructure is projected to be replaced at an estimated cost of \$17,493,700.00.

This would require a contribution of \$13,133 per serviced property to replace the water distribution system.

The water surplus for the last five years have averaged \$200,800. Assuming collection of a similar annual surplus for the planning period of 60 years the municipality would collect \$11,856,000. Included with the current reserves this would leave a short fall of \$2,637,700.

By increasing the annual water surplus to \$250,000 per year the municipality would be able to generate \$15,000,000. With current reserves this would supply sufficient reserves for the municipality to finance the replacement of the water distribution system.

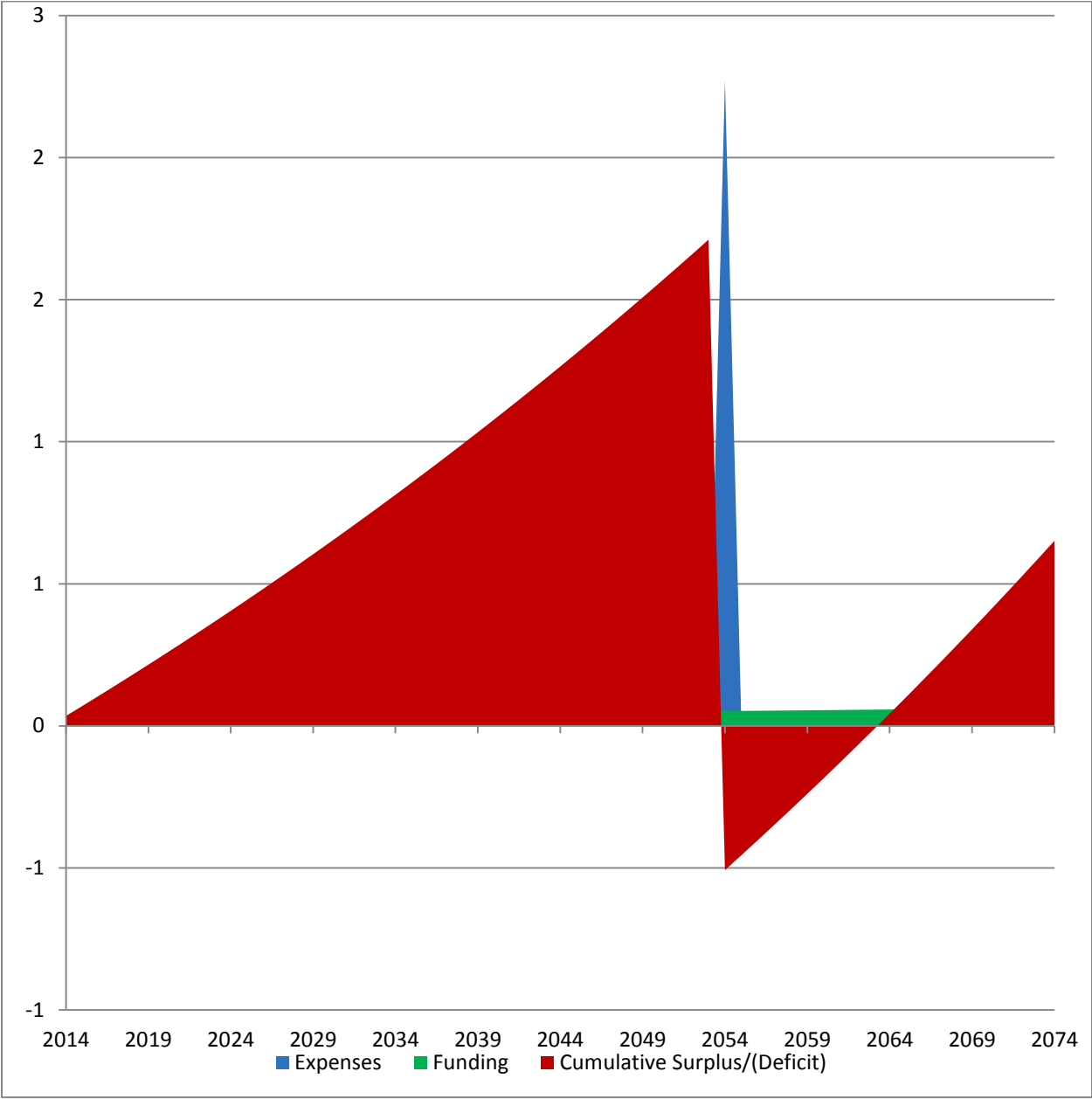


The above chart provides an illustration of what a \$175,000 annual surplus will do to offset the capital replacement of the water distribution system over the next sixty year period. The chart indicates that maintenance of this surplus would leave a short fall of over \$3 million year to offset the replacement cost of the water distribution system.

## **Sewer**

A sixty year projection of the cost associated with the capital replacement of the sewer collection system operated by the Township has been prepared based on 2013 costs. During the 2054 to 2063 period it is projected that all of the sewer collection system will need to be replaced at a projected cost of \$2,270,000.00. This would require a commitment of \$23,000 from each household to replace the collection system. There will be a need on the part of Council to increase the sewer rates to finance the capital replacement of the system.

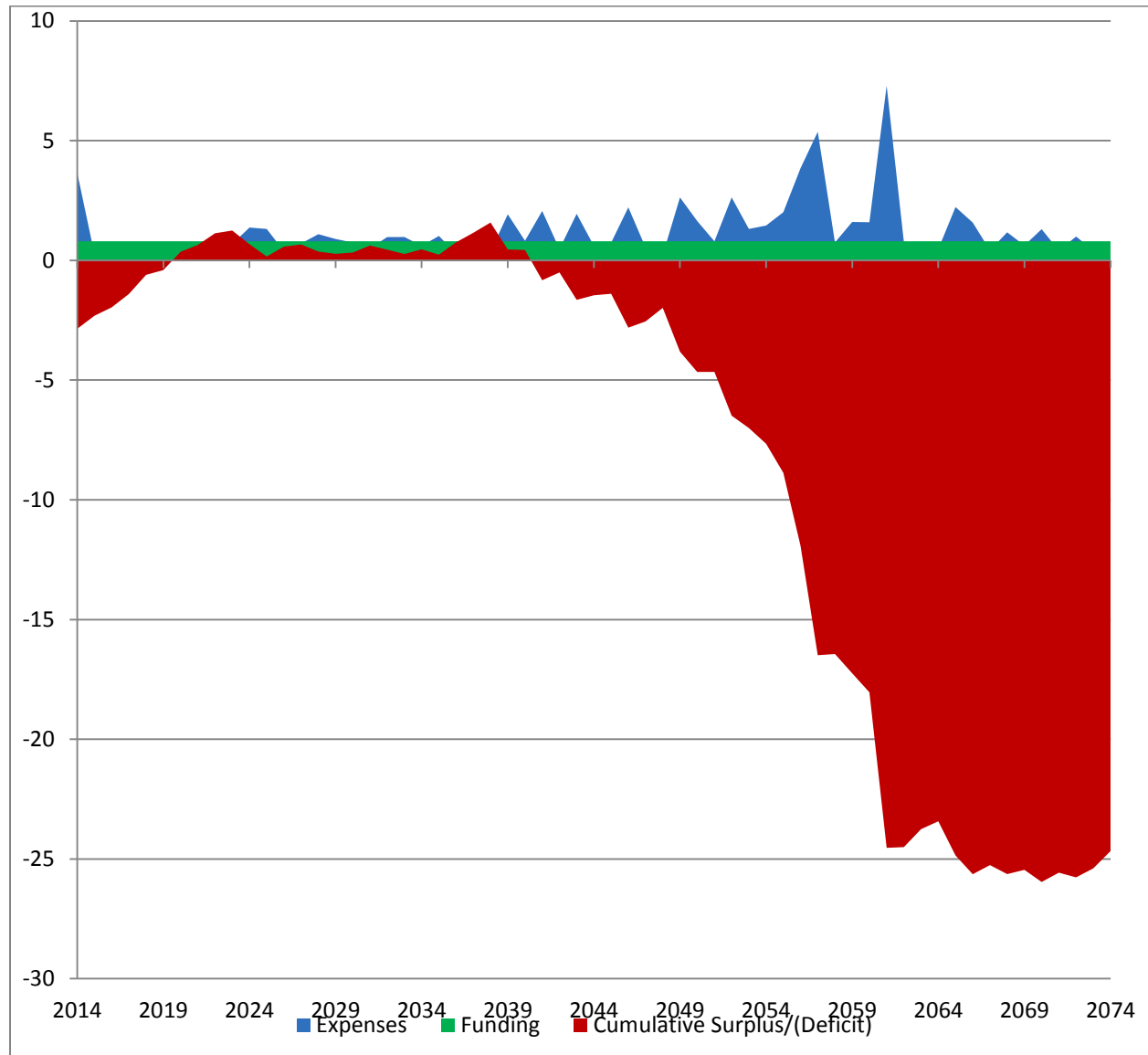
The following table provides a sixty year projection based on an annual surplus of \$35,000 per year. A one per cent increase per year in the surplus would generate sufficient revenue to fund the replacement of the sewer lines.



## Roads & Bridges

The capital replacement of the roads and bridges will be undertaken with local tax revenue. At this time there is no assurance of alternative sources of revenue.

The projections have been made based on the current capital budget for roads and bridges at \$800,000. Based on the assumptions made for capital replacement of the bridges and roads the current budget provides for some degree of safety until 2039. After 2039 the anticipated expenditures would require an increase in revenue flow.





## **Summary**

The Township of Enniskillen Asset Management Plan provides an overview of the roads, bridges, water and sewer lines.

The review of the water system financial projections indicates that an increase of \$50,000 annually to the current level of reserve collections would provide sufficient funds to replace the water distribution system. With the inclusion of structures and equipment to the asset plan in 2014 further review will be required of the projections.

The review of the sewer system financial plan clearly indicates a need to increase the user fees for the system to generate sufficient funds for replacement in the future.

The review of the road surfaces and bridges identifies a back log of work in the next five years. Over the following 20 years the modeling indicates sufficient revenue to offset the projected bridge and road surface costs. However this calculation will be affected in 2014 with the inclusion of road equipment and buildings. There will be a refinement of the pavement condition index for surface treated roads as well as the introduction of the revised bridge condition index. As a result of these changes the road and bridge financial strategy will be recalculated in 2014 to increase the annual funding of these capital assets. At present the municipality is not setting aside any reserves to address the replacement of these capital assets.

A more accurate picture of the Township financial plan for capital assets will be achieved in 2014 with the inclusion of the remaining assets and with the refinement of the modeling. At this time the modeling has provided a methodology that prioritizes projects based on accepted standards. The Township of Enniskillen Council will be faced with important decisions concerning the funding of near term projects as well as projects that will be constructed decades into the future.