THE ASSET MANAGEMENT PLAN FOR THE TOWNSHIP OF STIRLING-RAWDON

CREATED: 2013 in house

UPDATED: 2016 in house (appendixes)

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EXECUTIVE SUMMARY

Stirling-Rawdon began its drive into asset management in 2012. Over the past 2 years, the enactment of Asset Management has provided a number of benefits through improved accountability and a deeper appreciation of the extent and effect of aging infrastructure and shortfalls in funding levels.

Through the implementation of asset management best practices, infrastructure assets that support core municipal services are monitored and maintained at levels that enable Stirling-Rawdon to provide these services at manageable risks and a high level of reliability and confidence to those that receive these services.

Funding remains an ongoing challenge to overcome the accumulated backlog of capital renewals and maintenance deficits. However, through the implementation of data collection and analysis, knowledge of the infrastructure and associated operating activities is providing new insights on how to increase accountability, increase productivity, and maximize return on capital investments. Through business process re-engineering and use of this new found knowledge, there should be significant progress, some measureable (i.e. reduction of water losses and inflow/infiltration), with many other improvements where prior benchmarks did not exist; more activities being done with same resources and are difficult to measure. Enhancements in this regard don't translate into current financial surpluses or savings – they do contribute to increased effectiveness and efficiencies that either defer future costs or reduce current backlogs/deficits to smaller levels.

Stirling-Rawdon, with the support of higher levels of government, residents, and local elected officials is on its way of achieving sustainability with our roads and bridges by repairing and maintaining our existing system while replacing sections at the end of their life cycle. The water distribution and sanitary sewer collection services will be improved through rate increases and through the mitigation of expenses associated with water loss in the water distribution network, reduction of infiltration and inflow to the sewer network, and a collaborative and integrated approach to infrastructure management.

At this time, funding and associated resources remain the most significant challenge in reaching sustainable core infrastructure services, particularly with property tax funded core services such as drainage, road, and bridges.

ASSET MANAGEMENT PLAN – TOWNSHIP OF STIRLING-RAWDON

December 30, 2013

Introduction

The Township of Stirling-Rawdon, is very dependent on a working and serviceable infrastructure system. Our roads and bridges bring and take products from and to producers and consumers. Our water and sewer system is needed for the service of our residential and commercial residents. We have a wish to grow the municipality to a more sustainable level in terms of residential and commercial members of our community. To enable growth to happen changes and improvements need to be made to the way the township deals with its infrastructure. Through consultation, with local residents and by way of the municipal sustainability plan, priorities have been laid out in order for the municipality to move ahead and make the changes and improvements necessary for the future sustainable progress of the township.

The Asset Management Plan (AMP) was designed to work in harmony with the budget in order to inform the council in terms of what to do and when. The council has accepted the document as both a guide and tool to move the municipality to the place it needs to be at for present and future success.

The plan will be a gauge for residents to use in order to evaluate the municipality's success or shortcomings in terms of accomplishing the changes and improvements that the majority need and wishes to have done. The AMP is the best way to examine the current condition and performance of the infrastructure and also point the direction to achieve the desired benchmarks. The plan includes roads, bridges, water, and waste water systems with more assets to be added with anticipated periodic reviews.

The AMP will guide the work of the Township's Council, Administration, and Departments in aligning priorities and strategy. The AMP is a summary document that provides a comprehensive reference for all those concerned with the best management of the municipality. The AMP delivers a planned approach to the long-term management of assets, by providing a framework for optimizing future expenditures that match the community's desired levels of service; this plan will enable the most cost efficient allocation of resources.

The plan will be reviewed regularly to provide assurance to council, residents, staff and other stakeholders that the roads, bridges, and sewer and water systems and other infrastructure that the Township is responsible for is being managed efficiently and sustainably. The AMP covers the initial 10 year period along with projections to the end of life of the asset with yearly reviews done by the capital asset manager and reported to the public works department and council.

The Asset Management Plan was developed by the public works manager and capital asset manager in consultation with other stakeholders including, residents, council, public works department, administration, and finance. The public works manager, capital asset manager, and treasurer of the township all received training in development and implementation of an asset management plan through AMCTO, Ontario Good Roads Association, and AMO. Along with yearly ongoing plan review and adjustment by the public works officials, a full systematic review will be completed every term of council (4 years maximum).

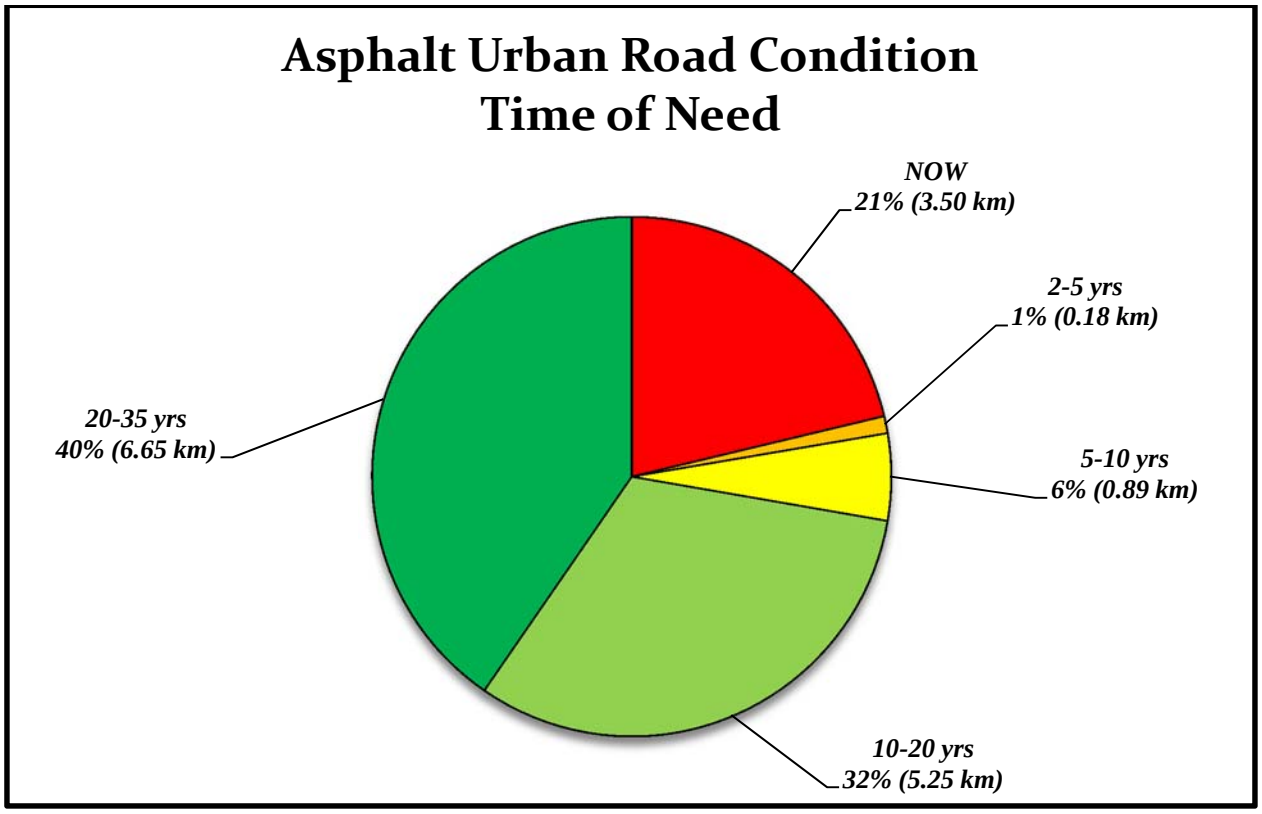
State of the Local Infrastructure

The Township of Stirling-Rawdon maintains a network of roads, bridges, and large and small culverts with a total replacement value of $118m. The road system is 536 lane kilometres of 2 lane road which requires 32 bridges and culverts >3 metre span to cross rivers, creeks, and drainage systems within the municipality. 34 kilometres of boundary road are also maintained by the township through agreement with abutting municipalities. There are over 20 kms of watermains along with the assorted valves and hydrants associated with the water system in the village of Stirling. Nearly 13 kms of sewer main both force and gravity serve the village for sanitary sewer purposes. Maintenance of these assets is completed from the township's Public Works Department which includes a 5 bay garage in the village of Stirling, a 4 bay garage and property just north of the village, and a 3 bay garage in the hamlet of Springbrook including sand domes and outbuildings at each. The replacement cost of the buildings is estimated at $4.0m. Further updates to buildings will be added in the coming months.

ROADS

	Road by Function and Surface Material	Total Length (in lane km's)	Average PCI	Useful life Remaining	Net Book PSAB (in millions) $	2013 Est. Replacement Cost (in millions) $	Needs	
							1-5 year (in millions) $	6-10 year (in millions) $
Paved	Arterial Rural	68.0	60	15	1.375	15.7	3.1	0.2
	Arterial Urban	16.0	50	7	0.667	5.6	1.3	0.8
	Local Residential (urban)	18.0	71	15	1.452	3.6	0.6	0.5
	Local Residential (rural)	22.0	0	0	0.407	4.8	0.6	0.0
Surface Treated	Arterial (rural)	30.0	20	0	0.138	3.0	0.8	0.0
	Residential (rural)	117.0	49	5	0.873	20.3	1.0	1.4
Gravel	Local Residential (rural)	264.0	Good	10	0.132	33.7	0.86	0.58
	* PSAB values may vary from numbers filed due to corrections				*$5.044m	$86.7m	$8.26m	$3.48m

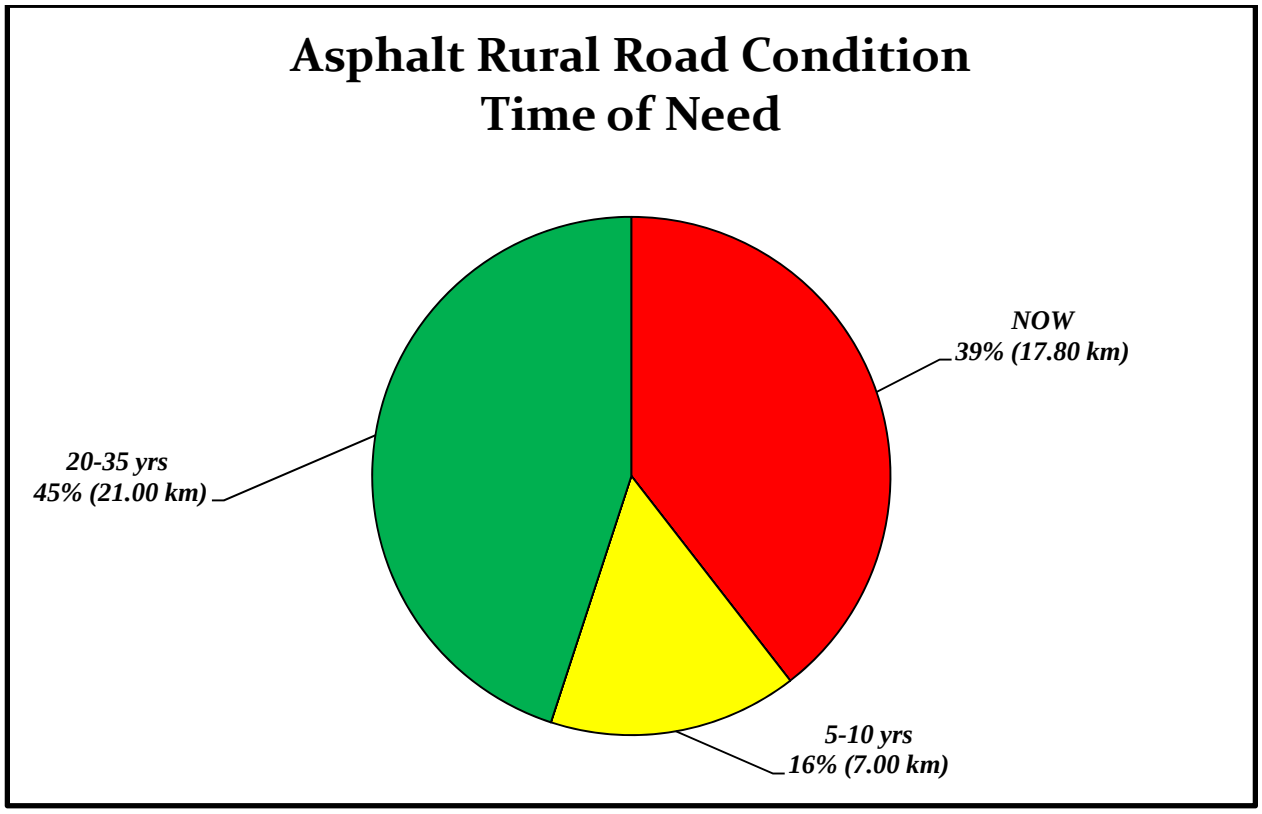
ASPHALT URBAN ROAD CONDITION



TIME OF NEED ASPHALT URBAN

Time of Need	# Roads	Percent	Kms
NOW	4	21.26%	3.50
2-5 yrs.	2	1.06%	0.18
5-10 yrs.	5	5.41%	0.89
10-20 yrs.	10	31.89%	5.25
20-35 yrs.	18	40.39%	6.65
Totals	39	100.00%	16.47

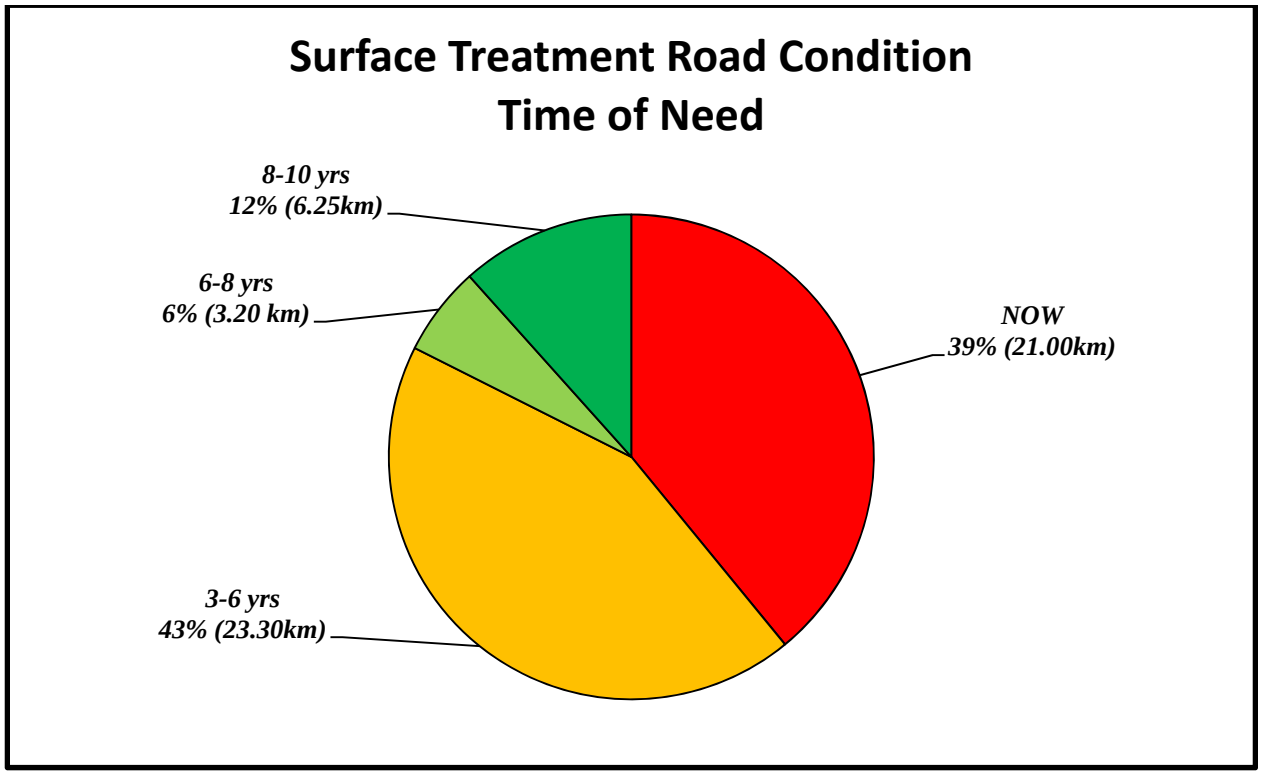
ASPHALT RURAL ROAD CONDITION



TIME OF NEED ASPHALT RURAL

Time of Need	# Roads	Percent	Kms
NOW	3	39.49%	17.80
2-5 yrs.	0	0.00%	0.00
5-10 yrs.	1	15.53%	7.00
10-20 yrs.	0	0.00%	0.00
20-35 yrs.	2	44.97%	20.27
Totals	6	100.00%	45.07

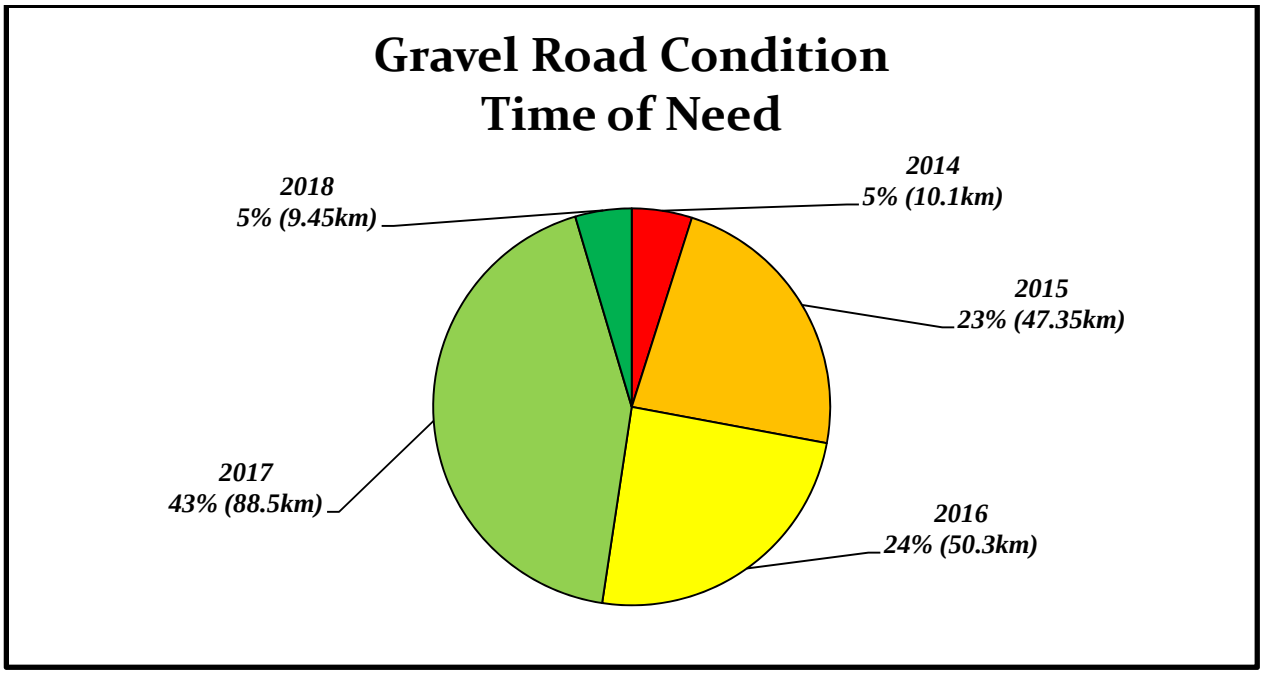
SURFACE TREATMENT ROAD CONDITION



TIME OF NEED SURFACE TREATED

Time of Need	# Roads	Percent	Kms
NOW	6	39.07%	21.00
3-6 yrs	5	43.35%	23.30
6-8 yrs	2	5.95%	3.20
8-10 yrs	5	11.63%	6.25
Totals	18	100.00%	53.75

TIME OF NEED GRAVEL ROADS

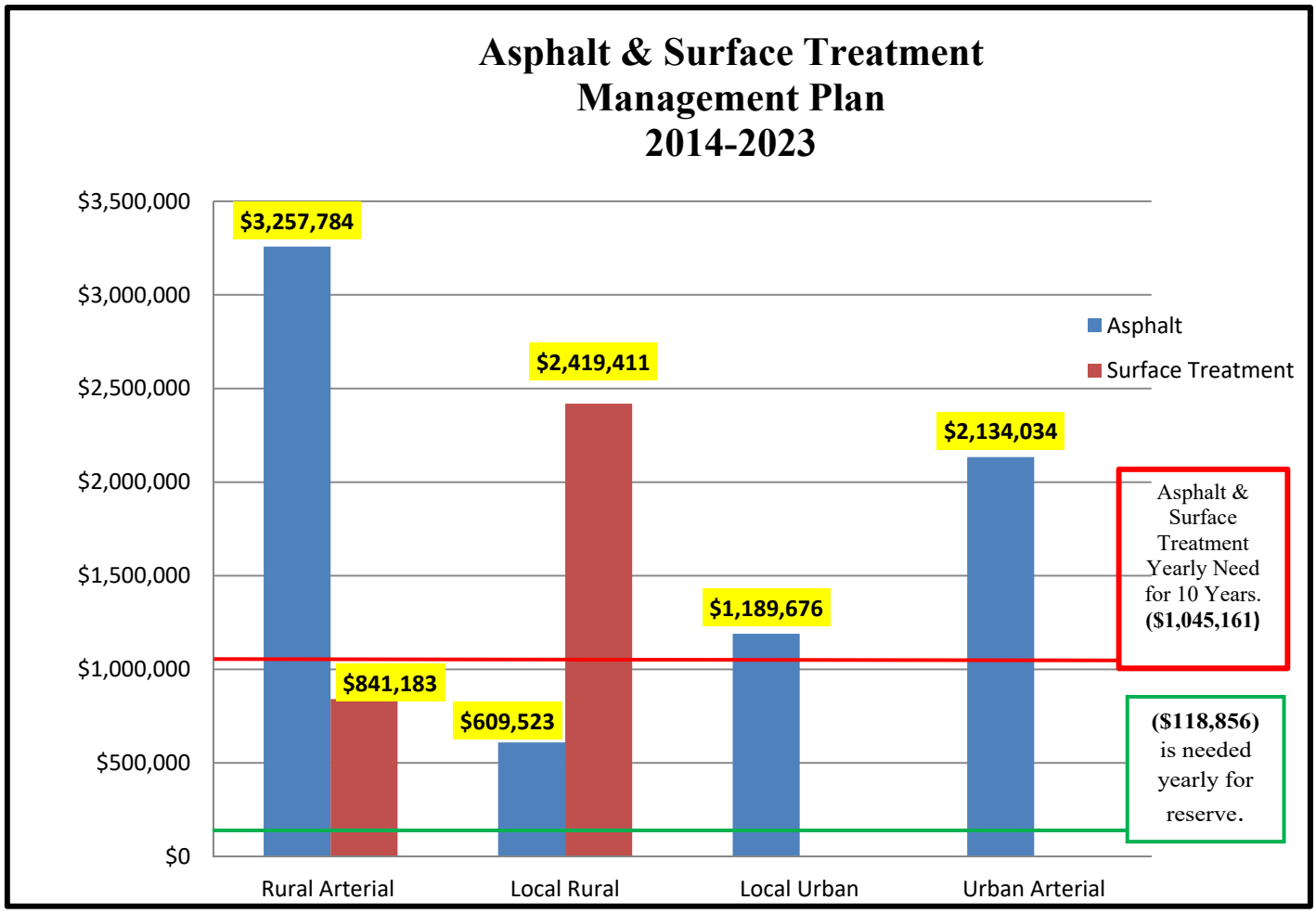


TIME OF NEED GRAVEL ROADS

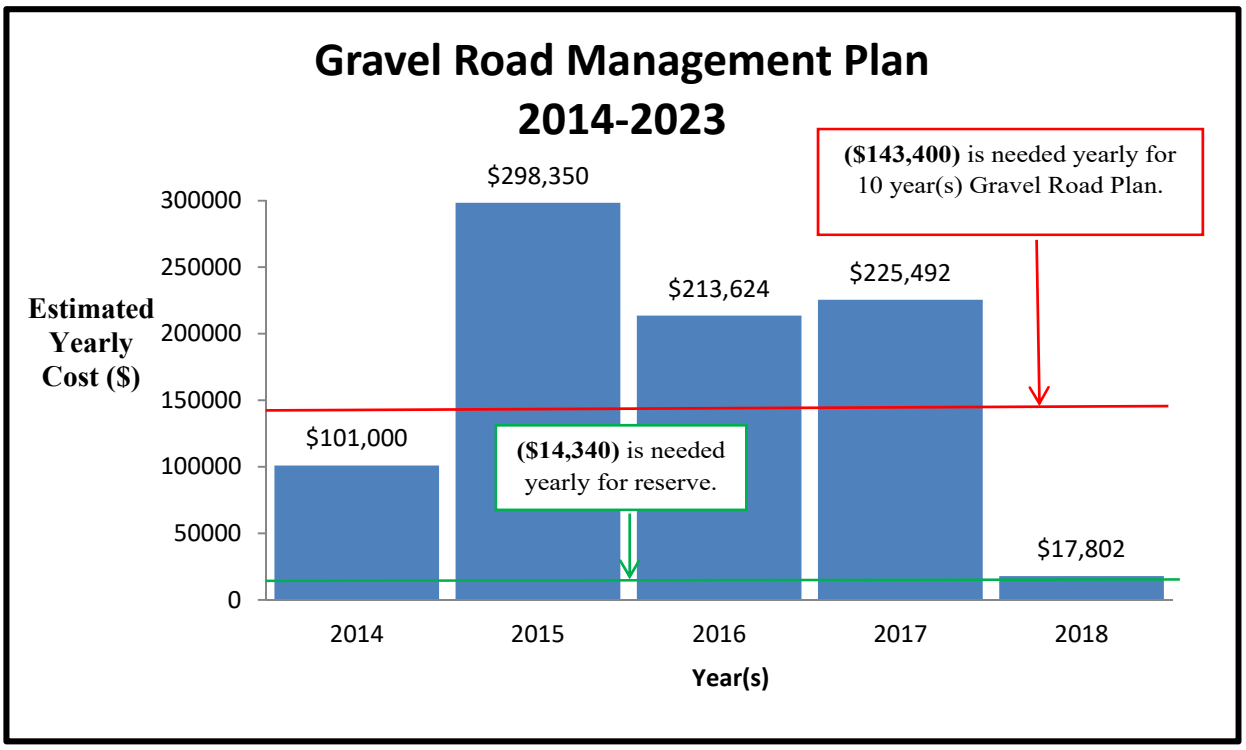
Time of Need	# Roads	Percent	KM
2014	8	4.91%	10.1
2015	15	23.02%	47.4
2016	14	24.45%	50.3
2017	22	43.02%	88.5
2018	2	4.59%	9.5
Total	61	100.0%	205.8

A full inventory of roads has been compiled for the municipality with the condition ratings assigned based on Ontario accepted condition indexing. Our locally accepted level of service, which is line with Ontario Minimum Maintenance Standards, is used for timely response to trouble spots and less than acceptable road conditions.

10 YEAR ASPHALT AND SURFACE TREATMENT NEEDS



10 YEAR GRAVEL ROAD NEEDS

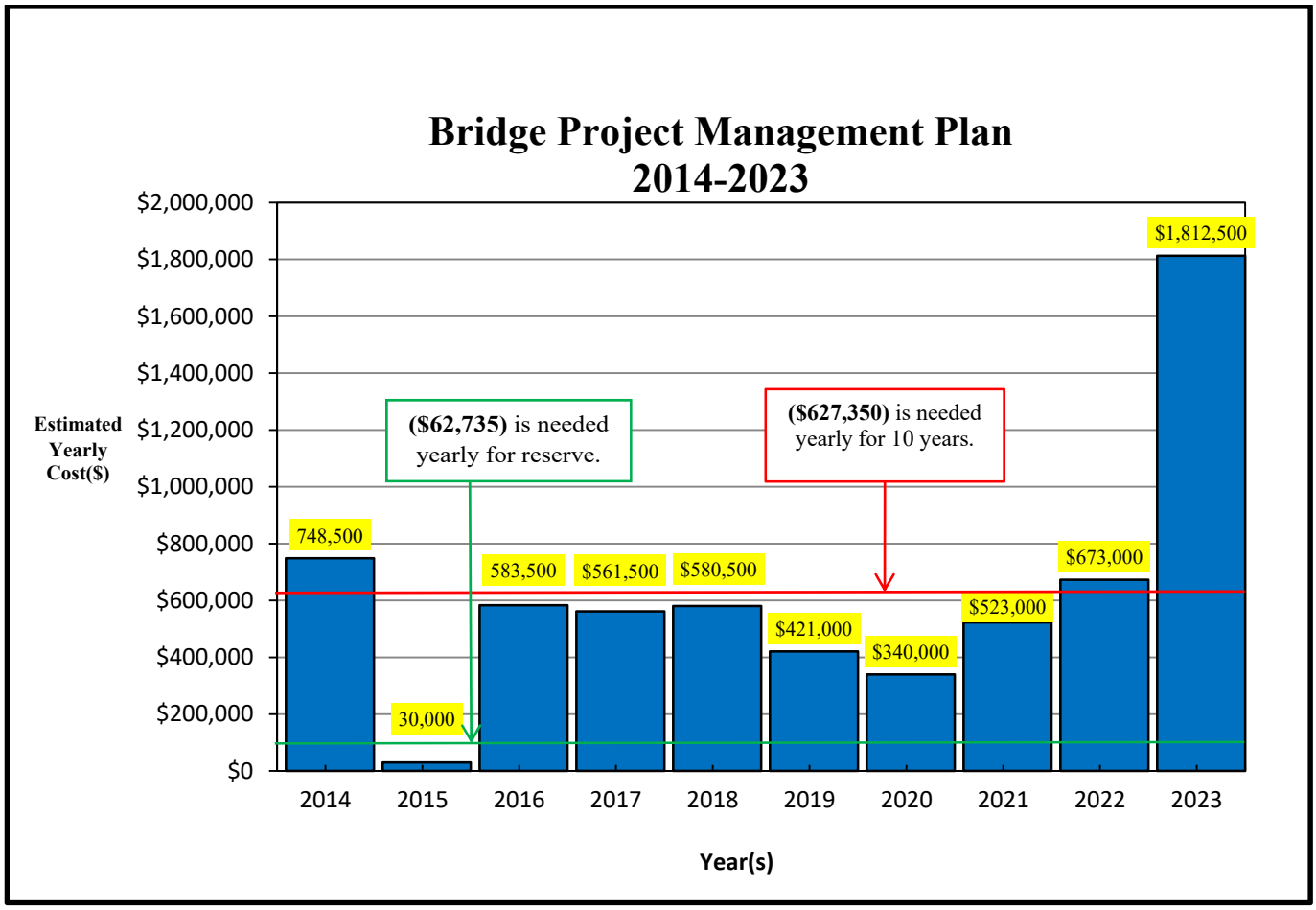


BRIDGES & CULVERTS

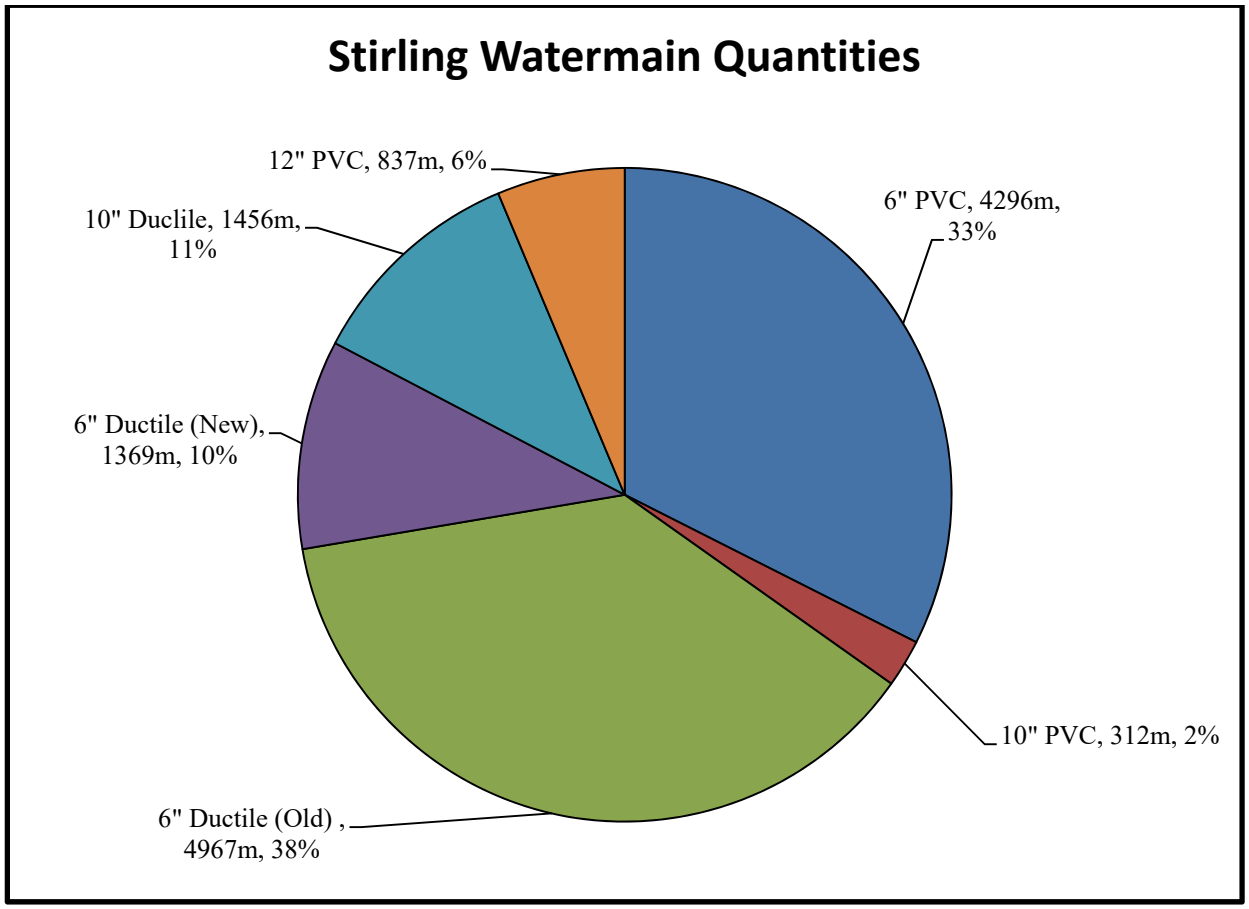
Number of Bridges & Culverts	Structure Type*	Total Deck Area (in m^2)	Average BCI	Useful Life	Net Book PSAB (in millions) $	2013 Est. Replacement Cost (in millions) $	Needs	
							Now, 1-5 year (in millions) $	6-10 year (in millions) $
23	Girder Structures	2414	65	75	0.87	$3.6	$2.504	$3.769
6	Box culvert open footing >3m span	572	70	75	0.10	$3.0	$0.106	$0.470
3	CSP Culvert >3m span	237	60	40	0.25	$0.9	$0.100	$0.090
438	CSP Culvert <3m Span	N/A	35	25	0.5	$1.1	$0.300	$0.538
Total					$1.72m	$8.6m	$3.010m	$4.867m

Bridges and culverts greater than 3m diameter are inspected according to the Ontario Structural Inspection Manual (OSIM). The municipality's bridges were inspected as usual in 2013 and the action plan is in line with the OSIM findings. Culverts less than 3m diameter were systematically inspected during the spring and summer of 2013 during the initial evaluation stage of the asset management program.

10 YEARS OF BRIDGE NEEDS



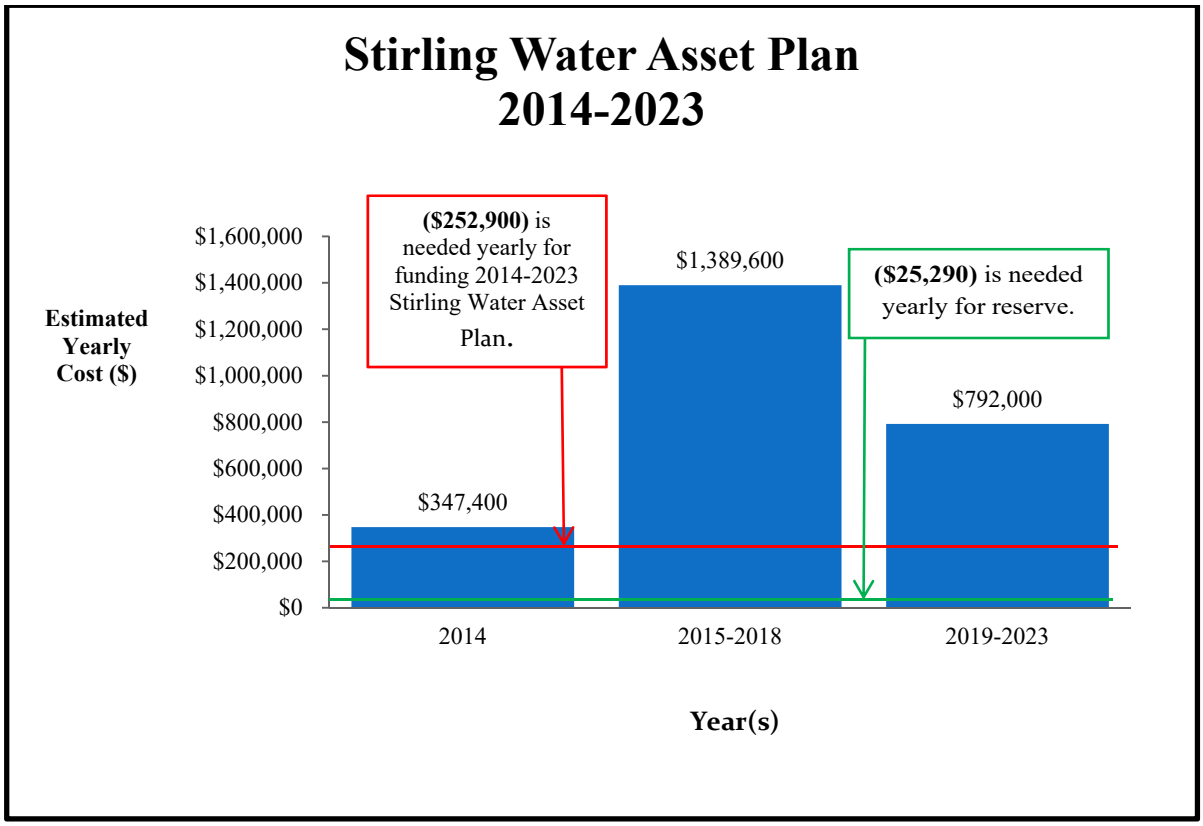
WATERMAIN QUANTITIES



WATER ASSETS

Structure Type*	Length (% of Total)	Average Condition Rating	Useful Life	Life Remaining	Net Book PSAB (in millions) $	2013 Est. Replacement Cost (in millions) $	Needs	
							Now, 1-5 year (in millions) $	6-10 year (in millions) $
6" PVC Watermain	4296	Good	75	48	$0.090	$1.078	$0	$0
10" PVC Watermain	312	Good	75	55	$0.005	$0.350	$0	$0
6" Ductile Watermain (Old)	4967	Poor	75	0	$0.100	$0.893	$0.893	$0
6" Ductile Watermain (New)	1369	Good	75	51	$0.027	$0.287	$0	$0
10" Ductile Watermain	1456	Good	75	49	$0.030	$0.022	$0	$0
12" PVC Watermain	8370	Fair	75	40	$0.016	$0.176	$0	$0
Hydrants	85	Fair	75	25	$0.109	$0.510	$0.144	$0.132
Valves	121	Fair	75	25	$0.045	$0.053	$0.060	$0.055
Curb Boxes	810	Good	50	40	$0.155	$1.215	$0.180	$0.165
Wells & Assoc. Equip.	4	Good	80	40	$0.100	$0.500	$0.340	$0.330
Tower & Assoc. Equip.	1	Good	50	27	$0.100	$1.000	$0.120	$0.110
Total					$0.78m	$6.08m	$1.737m	$0.792m

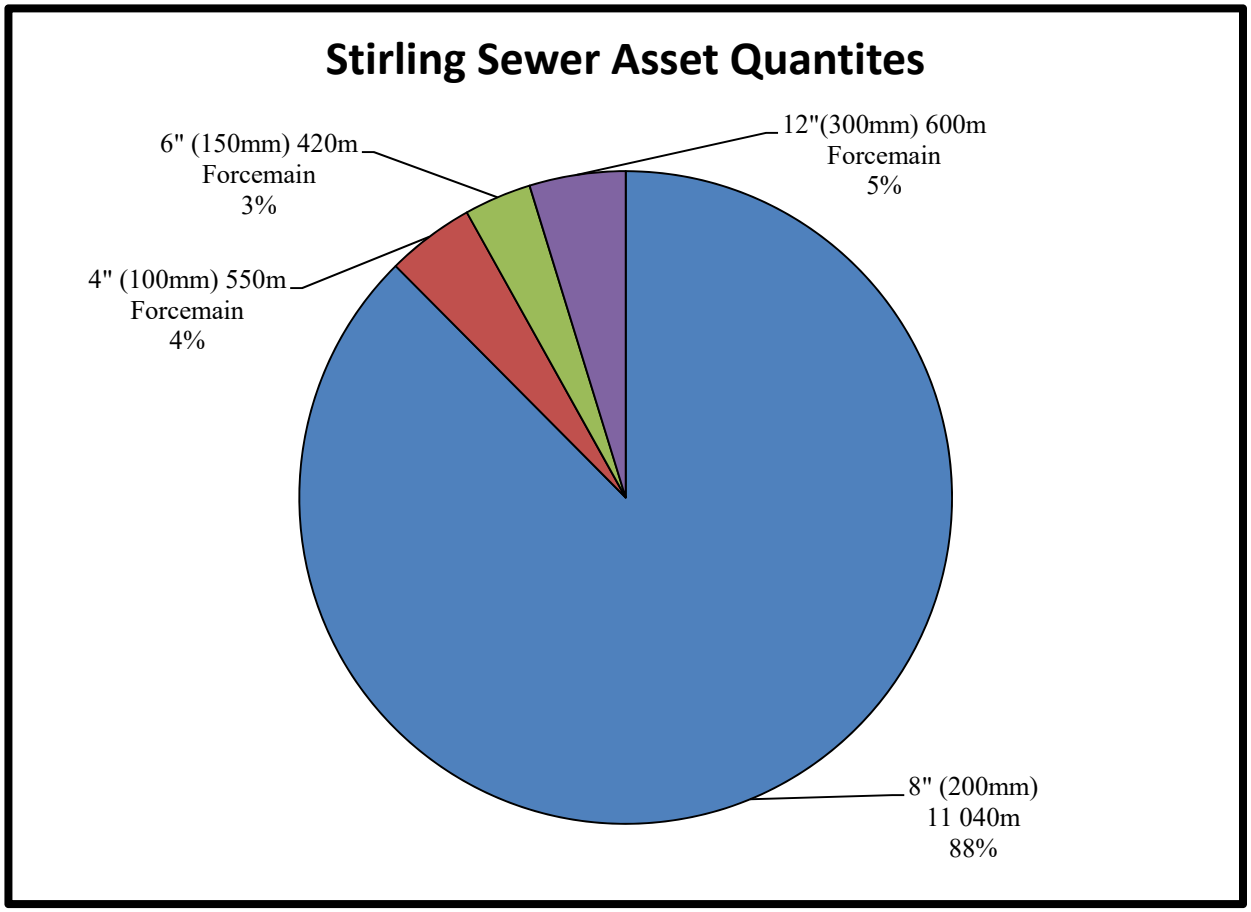
WATERMAIN ASSET PLAN



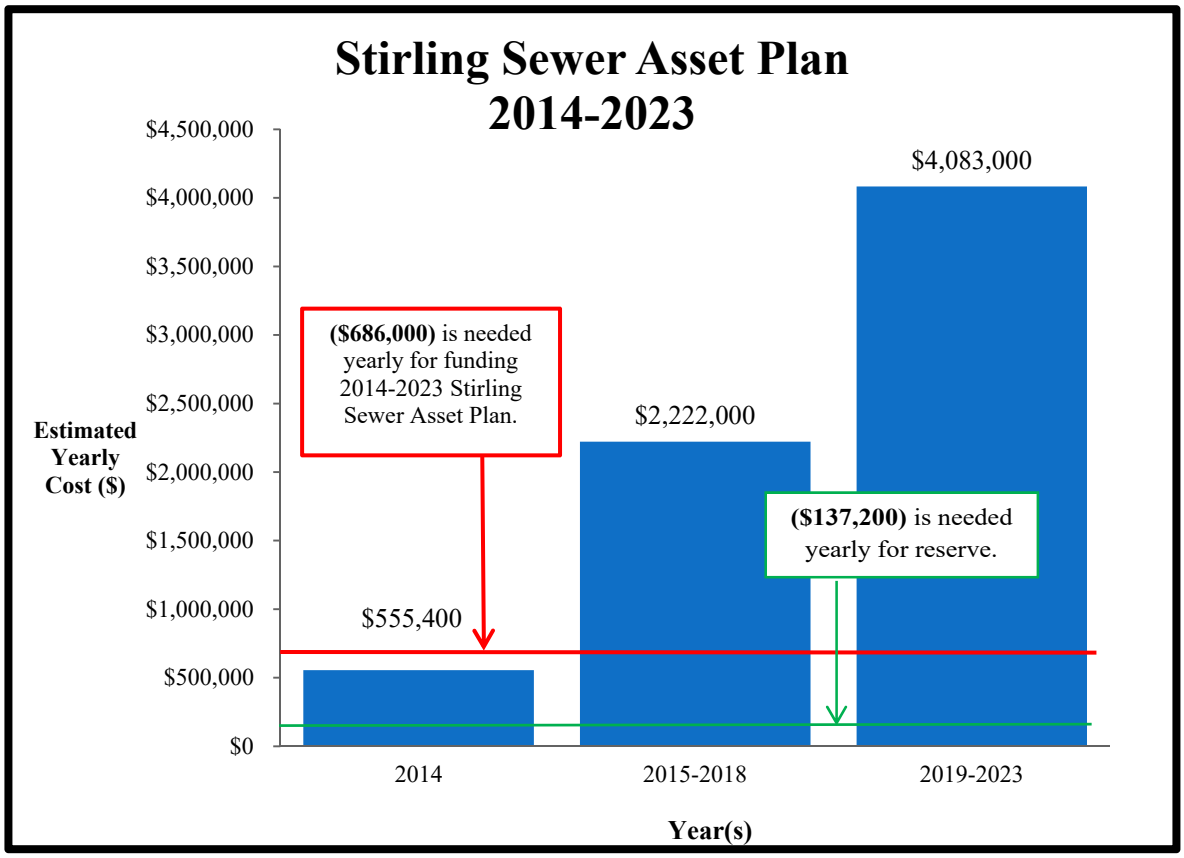
SANITARY SEWER ASSETS

Structure Type*	Length (% of Total)	Average Condition Rating	Useful Life	Life Remaining	Net Book PSAB (in millions) $	2013 Est. Replacement Cost (in millions) $	Needs	
							Now, 1-5 year (in millions) $	6-10 year (in millions) $
8” Sewer Pipe	11040 (88%)	Fair	75	30	$0.0038	$0.074	$2.504	$3.769
4" Force Main	550 (4%)	Fair	75	30	$0.0005	$0.003	$0.002	$0.002
6" Force Main	420 (3%)	Good	75	50	$0.0009	$0.004	$0.001	$0.001
12" Force Main	600 (5%)	Good	75	51	$0.0005	$0.003	$0.001	$0.001
Sanitary Sewer Valves	100	Good	75	25	$0.0007	$0.300	$0.001	$0.002
Sanitary Sewer Stations	5	Good	40	20	$0.500	$1.340	$0.268	$0.308
*Note PSAB values are 2012 values. Total					$0.506	$1.724m	$2.777m	$4.083m

SEWERMAIN QUANTITIES



SEWER ASSET PLAN



The information in this document is supported by:

A complete inventory database of infrastructure assets covered by the township's plan, including complete asset information (e.g. asset type/class, physical description, location, expected useful life, etc.) and information that requires regular updates (e.g. replacement cost, condition, performance, etc.) is in a working library within the public works and capital asset manager's offices. The database consists of spreadsheets, manually produced inspection and valuation documents and a GIS system supported by the recently instituted capital asset manager's office. Records of all assumptions, which are incorporated into the asset inventory, are recorded in stand-alone documentation for continued inspection and update. The Stirling-Rawdon data verification and condition assessment policies set out the timelines and methods for asset information gathering. This policy is consistent with provincial and general engineering and accounting standards.

EXPECTED LEVELS OF SERVICE

Expected levels of service are quality and quantity indicators, comprising many factors, such as those listed below, that establish clear quality thresholds at which municipal services should be delivered to the residents. They support the township's strategic goals and are based on resident`s expectations, statutory requirements and standards, and the financial capacity of the municipality to deliver those levels of service.

Levels of Service are used:

- to inform residents of the planned type and level of service to be offered;
- to identify the costs and benefits of the services offered;
- to assess suitability, affordability and equity of the services offered;
- as a measure of the effectives of the asset management plan;
- as a focus for the AMP strategy to deliver the required level of service.

In order for the municipality to establish a desired level of service, it is important to review the key factors involved in the delivery of that service. It is also important to establish some key performance metrics to gain a better understanding of the current level of service supplied.

Within this first AMP, factors affecting level of service will be outlined below and some key performance indicators for each asset type will be outlined for further review. This will provide a framework and starting point from which the municipality can determine future desired levels of service for each infrastructure class.

Key factors that influence the level of service are:

- Strategic Goals;
- Legislative Requirements;
- Expected Asset Performance;
- Community Expectations;
- Availability of Finances

Strategic Goals

Infrastructure levels of service can be influenced by strategic goals. Strategic plans spell out where an organization wants to go, how it`s going to get there, and helps decide how and where to allocate resources, ensuring alignment to the strategic priorities and objectives. It will help identify priorities and guide how municipal tax dollars and revenues are spent into the future. The level of importance that a community`s vision is dependent upon infrastructure, will ultimately affect the levels of service provided or those levels that it ultimately aspires to deliver.

Legislative Requirements

Infrastructure levels of service are directly influenced by many legislative and regulatory requirements. For instance, the Safe Drinking Water Act, the Minimum Maintenance Standards for municipal highways, building codes, and the Accessibility for Ontarians with Disabilities Act are all legislative requirements that prevent levels of service from declining below a certain standard.

Expected Asset Performance

A level of service will be affected by current asset condition, and performance and limitations in regards to safety, capacity, and the ability to meet regulatory and environmental requirements. In addition, the design life of the asset, the maintenance items required, the rehabilitation or replacement schedule of the asset, and the total costs, are all critical factors that will affect the level of service that can be provided

Community Expectations

Levels of services are directly related to the expectations that the general public has from the infrastructure. For example, the public will have a qualitative opinion on what an acceptable road looks like, and a quantitative one on how long it should take to travel between two locations. Infrastructure costs are projected to increase dramatically in the future, therefore it is essential that the public is not only consulted, but also be educated, and ultimately make choices with respect to the service levels that they wish to pay for.

Availability of Finances

Availability of finances will ultimately control all aspects of a desired level of service. Ideally, these funds must be sufficient to achieve municipal goals, meet legislative requirements, address an asset's life cycle needs, and meet community expectations. Levels of service will be dictated by availability of funds or elected officials` ability to increase funds, or the community's willingness to pay.

Key Performance Indicators

Performance measures or key performance indicators (KPI) that track levels of service should be specific, measurable, achievable, relevant, and time bound (SMART). Performance measures can be established and tracked through a systematic approach to inspection and documentation. In this way, through automation, and timely examination, results can be reviewed on an annual basis and adjustments can be made to the overall asset management plan, including the desired level of service targets.

In establishing measures, a good rule of thumb to remember is that maintenance activities ensure the performance of an asset and prevent premature aging, whereas rehabilitation activities extend the life of an asset. Replacement activities, by definition, renew the life of an asset. In addition, these activities are constrained by resource availability in particular, finances) and strategic plan objectives. Therefore, performance measures should not just be established for operating and maintenance activities, but also for the strategic, financial, and tactical levels of the

asset management program. This will assist all levels of program delivery to review their performance as part of the overall level of service provided.

TRANSPORTATION SERVICES

The Townships' transportation network comprises approximately 536 lane kilometres of road of which 272 kilometres are hardtop and 264 kilometres are gravel. The roads network includes 32 bridges and large culverts and 438 culverts less than 3 metres diameter. There are approximately 15 kilometres of sidewalk, associated curbs and road signs. Together the transportation infrastructure enables the township to deliver transportation and pedestrian services and give residents options for moving about in a safe and efficient manner.

Scope of Services

Movement- providing for the movement of people and goods
Access- providing access to residential, commercial, and industrial properties and other community amenities
Recreation- providing for recreational use, such as walking, cycling, or special events such as parades

PERFORMANCE INDICATORS

Strategic Indicators	Percentage of total reinvestment compared to asset replacement value Completion of strategic plan objectives (related to transportation)
Financial Indicators	Annual revenues compared to annual expenditures Annual replacement value depreciation compared to annual expenditures Total cost of borrowing compared to total cost of service Revenue required to maintain annual network growth
Tactical Indicators	Percentage of road network rehabilitated/reconstructed Value of bridge/large culvert structures rehabilitated or reconstructed Overall road condition index as a percentage of desired condition index Overall bridge condition index as a percentage of desired condition index Annual adjustment in condition indexes Annual percentage of network growth Percent of paved road lane km where the condition is rated poor or critical Number of bridge/large culvert structures where the condition is rated poor or critical Percentage of road network replacement value spent on operations and maintenance Percentage of bridge/large culvert structures replacement value spent on operations and maintenance
Operational Indicators	Percentage of road network inspected within last 5 years Percentage of bridge/large culvert structures inspected within last two years Operating costs for paved roads per lane km Operating costs for gravel roads per lane km Operating costs for bridge/large culvert structures per square metre Number of customer requests received annually Percentage of customer requests responded to within 24hrs

WATER & WASTE WATER SERVICES

The Township's water distribution network comprises of 13.2 kilometres of watermain and 85 hydrants. The waste water network comprises of 13.2 kilometres of sanitary sewer main and 185 manholes.

Scope of Services

- The provision of clean safe drinking water through a distribution network of water mains and pumps
- The removal of waste water through a collection network of sanitary sewer mains

PERFORMANCE INDICATORS

Strategic Indicators	Percentage of total reinvestment compared to asset replacement value Completion of strategic plan objective (related water/waste water)
Financial Indicators	Annual revenues compared to annual expenditures Annual replacement value depreciation compared to annual expenditures Total cost of borrowing compared to total cost of service Revenue required to maintain annual network growth Lost revenue from system outages
Tactical Indicators	Percentage of water/waste water/reconstructed Overall water/waste water network condition index as a percentage of desired condition index Annual adjustment in condition indexes Annual percentage in growth/ waste water Percentage of mains where the condition is rated poor or critical for each network Percentage of water/waste water replacement value spent on operations and maintenance
Operational Indicators	Percentage of water/waste water network inspected Operating costs for the collection of wastewater per kilometre of main Number of wastewater per kilometre of main Operating costs for the distribution/transmission of drinking water per kilometre of water distribution pipe Number of days when a boil water advisory by the medical officer of health, applicable to a municipal water supply, was in effect Number of water main breaks per 100 kilometres of water distribution pipe in a year Number of customer requests received annually per water/waste water networks Percentage of customer requests responded to within 24hrs per water/waste water network

OBJECTIVE

To institute a set of strategic actions based on best practice that will enable the assets to provide a desired and sustainable level of service, manage risk, and control costs. The AMP Strategy will advance a process that can be applied to the needs identified and prioritized for maintenance, rehabilitation, and renewal activities. This will assist in the initial 10 year plan, including growth projections, to ensure the best overall condition and performance of the township's infrastructure. This section also contains an overview of condition assessment techniques for each asset class; the necessary interventions, including actions with the best return on investment; as well as prioritizing techniques, including risk, to determine which priority projects should move forward into the budget first.

LIFE CYCLE ANALYSIS

An industry study was carried out to determine which life cycle activities can be applied at the appropriate time in an asset's life, to provide the greatest additional life at the lowest cost. In the asset management industry, this is simply put as doing the right thing to the right asset at the right time. If these techniques are applied across entire asset network (e.g. the entire road network), Stirling-Rawdon could gain the best overall asset condition while expending the lowest total cost for those programs.

Pavement Inspections

Stirling-Rawdon council asked the public works manager to complete a thorough inspection of the township's road system. The evaluation that was completed included the whole roadway corridor including related culverts and road signs. The pavement evaluation was produced according to the Ontario Good Roads/
Examples of surface distresses are:

- For asphalt surfaces - Alligator Cracking / Distortion / Excessive Crown / Flushing / Longitudinal Cracking / Map Cracking / Patching / Edge Cracking / Potholes / Ravelling / Rippling / Transverse Cracking / Wheel Track Rutting

- Roughness data was gathered by driving the road section in both directions at the posted speed limit with a passenger and assigning a ride comfort score according to the driver and passenger comfort level feedback.

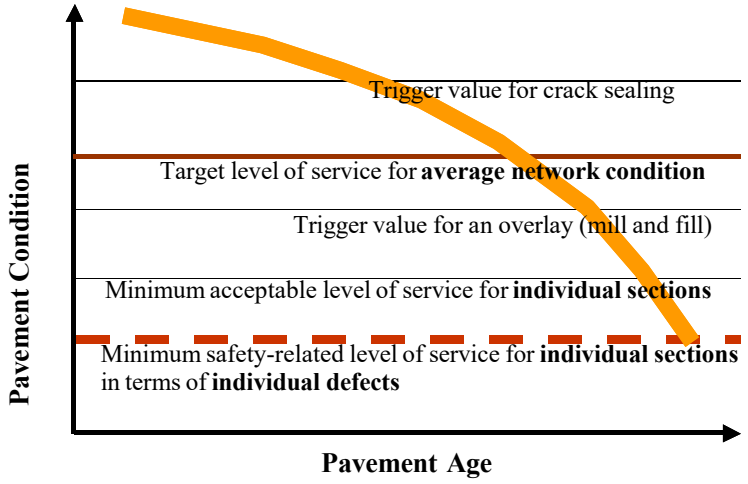
Although this method is not as sophisticated as using expensive evaluation vehicles the township also had trained evaluators walk a representative section of each section of the roadway to gather information on cracking, distortions, potholes, raveling, rippling, and wheel rutting. Through ride comfort evaluations, walking representative sections of each road, and thorough windshield surveys of actual road defects; the overall evaluation of condition is complete and thorough. The above process is an excellent way to capture road condition as the inspectors one a (civil technician) one a (C.E.T.) and the manager (C.E.T.) all became very aware of the road system shortcomings and potential solutions.

Another option for an ongoing level of condition assessment is for public works personnel to perform simple windshield surveys as part of their regular patrols. Some municipalities have purchased data collection software, or hired engineering companies to perform inspections. Stirling-Rawdon has utilized the public works manager along with a full time capital asset manager to assist this process and to standardize what presence of defects would constitute a good, fair, poor or failed score. Lacking any other data for the complete road network, this can still be seen as a good method and will assist greatly with the overall management of the road network.

Paved Roads

The following analysis has been conducted at a high level, using industry standard activities and costs for paved roads. With future updates of this Asset Management Strategy, the Township may wish to run the same analysis with a detailed review of Township activities used for roads and the associated local costs for those work activities.

The following diagram depicts a general deterioration profile of a road with a 30 year life.



As shown on the previous page, during the road's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; preventative maintenance; rehabilitation; and replacement or reconstruction.

The thresholds for when certain work activities should be applied to also coincide approximately with the condition state of the asset as shown below:

Excellent Condition (Maintenance only phase)

Condition Range: l00 - 76

- Maintenance only

Good Condition (Preventative maintenance phase)

Condition Range: 75 - 51

- Crack Sealing
- Emulsions

Fair Condition (Rehabilitation phase)

Condition Range: 50-26

- Resurface - Mill & Pave
- Resurface - Asphalt Overlay
- Single & Double Surface Treatment (for rural roads)

With future updates of this Asset Management Strategy the Township may wish to review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the Township's work program. By adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. Adjustments will be an important component of future Asset Management Plans, as the Province requires each municipality to present various management options within the financing plan.

The table below outlines the costs for various road activities, the added life obtained for each, the condition range at which they should be applied, and the cost of 1 year added life for each (cost of activity/added life) in order to present an apples to apples comparison.

Treatment	***Est. Cost per m²***	***Additional Years of Life***	***Condition Range***	***Cost per Year of Added Life***
Urban Reconstruction	$190	35	25-0	$5.43
Urban Resurface	$85	20	50-26	$4.25
Rural Reconstruction	$140	35	25-0	$4.00
Rural Resurface	$50	18	50-26	$2.77
Double Surface Treat	$13	11	50-26	$1.18
Crack Sealing	$2.50	4	75	$0.63

As in the table above, preventative maintenance activities such as crack sealing have the lowest associated cost (per sq. m) in order to obtain one year of added life. Unfortunately preventative maintenance activities can only be applied to a road at a relatively early point in the life cycle. The Township should undertake a permanent preventative maintenance program for all paved roads and a portion of the maintenance budget should continuously be allocated to this.

Rehabilitation activities, such as urban and rural resurfacing or double surface treatments for rural roads have a lower cost to obtain each year of added life than full reconstruction activities. The municipality engages in an active rehabilitation program for urban and rural paved roads and a portion of the capital budget is dedicated to this. In order to implement the above programs it is important to continually update a general condition score for each road segment, established through the assessment protocols as previously described. The "worst first" budget approach, where no life cycle activities other than reconstruction at the end of a roads life, will result in the most costly method of managing a road network overall.

Gravel Roads

As reported in the State of the Infrastructure section, just less than 50% of Stirlng-Rawdon's road network is comprised of gravel roads. The life cycle activities required for these roads are quite different from paved roads. Gravel roads require a cycle of perpetual maintenance, including general re-grading, reshaping of the crown and cross section, gravel spot and section replacement, dust abatement and ditch clearing and cleaning.

Gravel roads can require frequent maintenance, especially after rainy periods, in the spring, and when accommodating increased traffic. Wheel motion shoves material to the outside as well as in-between travelled lanes, leading to rutting, reduced water-runoff, and eventual severe road deterioration. This deterioration process is prevented if interrupted early enough, simple re-grading and compaction is sufficient, with material being pushed back into the proper profile.

As a high proportion of gravel roads can have a significant impact on the maintenance budget, further updates of this asset management will include the study of traffic volumes and maintenance requirements in more detail for its gravel road network. Similar studies elsewhere have found converting certain roadways to surface treated or paved surfaces can be very cost effective especially if frequent maintenance is required due to higher traffic volumes. Roads within the gravel network will be ranked and rated using the following criteria:

- Usage - traffic volumes and type of traffic
- Functional importance of the roadway
- Known safety issues
- Frequency of maintenance and overall expenditures required.

Through the above type of analysis, a program will be introduced to convert certain gravel roadways into surface treated or paved roads, reducing overall costs, and be brought forward into the long range budget.

BRIDGE & CULVERT (> 3M) INSPECTIONS

Ontario municipalities are mandated by the MTO to inspect all bridge structures that have a span of 3 metres or more, according to the OSIM. At present, in the Township, there are 32 structures that meet this criterion. Structure inspections must be performed by, or under the guidance of, a structural engineer, must be performed once every two years, and include such information as structure type, number of spans, span lengths, other key attribute data, detailed photo images, and structure element by element inspection, rating and recommendations for repair, rehabilitation, and replacement.

The best approach to develop a 10 year needs list for the Township's relatively small structure portfolio is to have the structural engineer who performs the inspections to develop a maintenance requirements report, and rehabilitation and replacement requirements report as part of the overall assignment. This report is part of our RFP request every two years. In addition to refining the overall needs requirements, the structural engineer identifies those structures that require more detailed investigations and testing.
Examples of these investigations are:

- Deck Condition Survey
- Delamination Survey of Asphalt Covered Deck
- Substructure Condition Survey
- Coating Condition Survey
- Underwater Investigation
- Fatigue Investigations
- Structural Evaluation

Through the OSIM recommendations and additional detailed investigations, a 10 year needs list is developed for the municipality's bridges and large culverts. The results of the OSIM inspection for each structure, whether BCI (bridge condition index) or general condition (good, fair, poor, critical) are entered into the capital asset manager’s data base to update results and analysis for the development of the budget.

WATER NETWORK INSPECTIONS

Unlike sewers, watermains are very difficult to inspect from the inside due to the high pressure flow of water ongoing within the water network. Physical inspections require a disruption of service to residents, can be very expensive, and are time consuming to set up. It is a best practice that physical inspection of watermains normally only occurs for high risk, large watermains within the system, only when there is a requirement.

There are a number of high tech inspection techniques in the industry for large diameter pipes but these should be researched first for applicability as they are quite expensive. Examples are:

- Remote Field Eddy Current
- Ultrasonic and Acoustic Techniques
- Impact Echo
- Geo-Radar

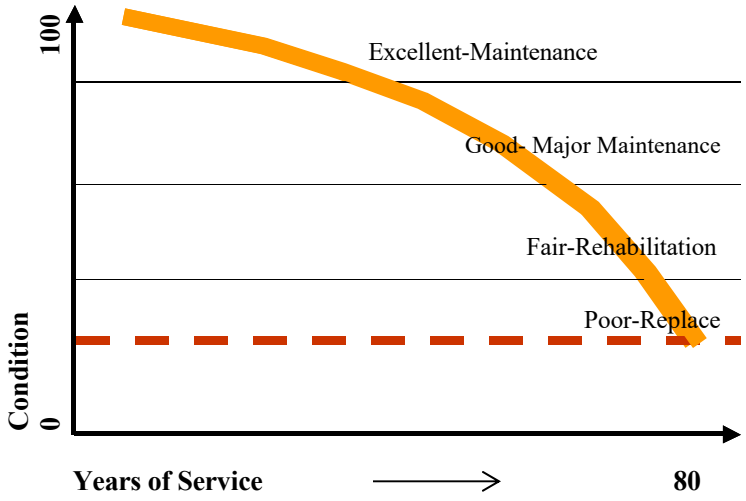
For the most pipes within the distribution network gathering information in regard to the main and its surroundings can supply the best method to determine a general condition. Key data that could be used, along with weighting factors, to determine an overall condition score are listed below:

- Age
- Material
- Number of Breaks
- Hydrant Flow Inspections
- Soil Conditions

Understanding the age of the pipe will determine useful life remaining, but watermains fail for other reasons than just age. The material the pipe is constructed of is important to know as different types of pipe have different design lives and different deterioration rates. Keeping a water main break history is one of the best analysis tools to predict future pipe failures and to assist with programming rehabilitation and replacement schedules. The township's hydrant flow tests for fire flow prevention purposes can be useful in helping to determine a main's condition. If a hydrant has a relatively poor flow condition it could be indicative of a high degree of encrustation within the attached water main, which could then be flagged as a candidate for cleaning or possibly lining. Finally, soil condition is important to understand as certain soil types can be very aggressive at causing deterioration on certain pipe types. The Township will develop a rating system for the mains within the distribution network based on the availability of data, and funds will need to be budgeted for this development.

The following diagram depicts a general deterioration profile of a water main with an 80 year life.

Watermain Deterioration Profile



As shown above, during the water main's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These thresholds are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction.

The thresholds for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown below:

Excellent Condition

Condition Range: 100 - 76

- Maintenance only (cleaning & flushing, etc.)

Good Condition

Condition Range: 75 - 51

- Water Main break repairs
- Small pipe section repairs

Fair Condition

Condition Range: 50 -26

- Structural Water Main Lining

Poor Condition

Condition Range: 25 - 1

- Pipe Replacement

Failed Condition

Condition Range: 0

- Failed includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "Poor" category above.

Category	Cost/m	Years of Added Life	Condition	Cost/Added Life m/yr
Rehabilitation				
100-300mm	$310	50	50-75	$6.20
301-400mm	$620	50	50-75	$12.40
401-700mm	$1500	50	50-75	$30.00
>701mm	$1900	50	50-75	$38.00
Replacement				
100-300mm	$350	80	76-100	$4.38
301-400mm	$700	80	76-100	$8.75
401-700mm	$1500	80	76-100	$18.75
>701mm	$2000	80	76-100	$25.00

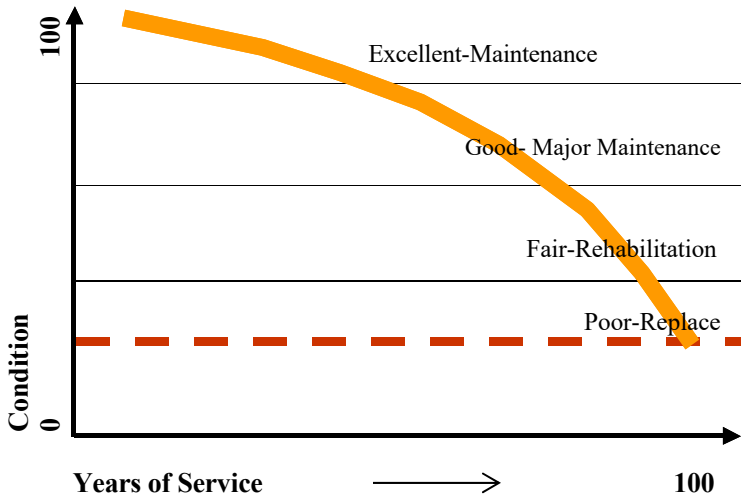
Water Rehabilitation still requires some digging and are actually more expensive on a life cycle basis; but, if the road above the water main is in good condition lining avoids the cost of road reconstruction still resulting in a cost effective solution.

The industry is continually expanding its technology in this area and therefore future costs should be further reviewed for change and possible price reductions. At this time, the township should only utilize water main structural lining when the road above requires rehab or no work.

SANITARY SEWER NETWORK INSPECTIONS

The most practical type of sanitary sewer inspection is the use of CCTV. The method involves a small robotic crawler vehicle with a CCTV camera attached to the end that is lowered into a maintenance hole into the sewer main to be inspected. The vehicle and camera travel the along the pipe providing a video feed to the technician/inspector who records all defects and information regarding the pipe. Construction and deterioration problems can be discovered with this method including open/displaced joints, infiltration of tree roots, infiltration & inflow water/fill, cracking, exfiltration, collapse, distortion of pipes and more. CCTV inspection is a good tool for locating and evaluating structural defects and general condition of underground pipes. Even though CCTV is an excellent option for inspection of sewers it is a fairly costly process and does take significant time to inspect a large volume of pipes.
The following diagram depicts a general deterioration profile of a sewer main with a l00 year life.

Sewer Deterioration Profile



As shown on the previous page, during the sewer main's life cycle there are various windows available for work activity that will maintain or extend the life of the asset. These windows are: maintenance; major maintenance; rehabilitation; and replacement or reconstruction.

The windows for when certain work activities should be applied also coincide approximately with the condition state of the asset as shown below:

Excellent Condition

Condition Range: l 00 - 76

- Maintenance only

Good Condition

Condition Range: 75 - 51

- Manhole repairs
- Small pipe section repairs

Fair Condition

Condition Range: 50 -26

- Structural Lining

Poor Condition

Condition Range: 25 - l

- Pipe Replacement

Failed Condition

Condition Range: 0

- Failed includes assets beyond their useful lives which make up the backlog. They require the same interventions as the "Poor" category above.

With future updates of this Asset Management Plan the Township will review the above condition ranges and thresholds for when certain types of work activity occur, and adjust to better suit the Townships work program. When adjusting these thresholds, it actually adjusts the level of service provided and ultimately changes the amount of money required. Adjustments will be an important component of future Asset Management Plans, as the province requires municipalities to present various management options within the financing plan.

The table below outlines the costs, by pipe diameter, for various sewer main rehabilitation (lining) and replacements. The columns display the added life obtained for each activity, the condition range at which they should be applied, and the cost of 1 year added life for each (cost of activity/added life) in order to present an apples to apples comparison.

Category	Cost/m	Years of Added Life	Condition	Cost/Added Life m/yr
Rehabilitation				
100-300mm	$180	75	50-75	$2.40
301-600mm	$285	75	50-75	$3.80
601-900mm	$1800	75	50-75	$24.00
>901mm	$1800	75	50-75	$24.00
Replacement				
100-300mm	$400	100	76-100	$4.00
301-600mm	$700	100	76-100	$7.00
601-900mm	$900	100	76-100	$9.00
>901mm	$1500	100	76-100	$15.00

As can be seen in the above table, structural rehabilitation or lining of sewer mains is an extremely cost effective industry activity and solution for pipes with a diameter </= 600mm. The unit cost of lining is approximately one half of replacement and the cost to obtain one year of added life is half the cost. For Stirling, this diameter range would account for 100% of sanitary sewer mains. Structural lining has been proven through industry testing to have a design life (useful life) of 75 years, however, it is believed that liners will probably obtain 100 years of life (the same as a new pipe). For sewer mains with diameters greater than 600mm specialized liners are required and therefore the costs are no longer effective. It should be noted, however, that the industry is continually expanding its technology in this area and therefore future costs should be further reviewed for change and possible price reductions.

The township should engage in an active structural lining program for sanitary mains and a portion of the capital budget be dedicated to this. In order to implement this it will be important to also establish a condition assessment program to establish a condition score for each sewer main within the sanitary network, and therefore identify which pipes good candidates for structural lining.

Growth and Demand

A municipality should have specific plans associated with population growth. It is essential that the asset management strategy should address not only the existing infrastructure, as above, but must include the impact of projected growth on project schedules and funding requirements. Projects will include the funding of the introduction of new infrastructure, and/or the expansion of existing infrastructure to meet new demands.

ADMINISTRATIVE ACTIONS

The Township will explore, as suggested through provincial requirements, which administrative solutions should be incorporated into the budgets for the road, bridge, water, and sewer, infrastructure programs. These solutions are such items as studies, policies, condition assessments, consultation exercises, etc., which could potentially extend the life of assets, lower total asset program costs in the future, or possibly remove the asset from municipal responsibility (closure).

Some solutions for a municipality include linking the AMP to the strategic plan, infrastructure plan, better integrated infrastructure and land use planning, public consultation on levels of service, and condition assessment programs. As part of future asset management plans, a review of these requirements should take place, and a portion of the capital budget should be dedicated for these items in each programs budget.

Under this category of solutions, the Township should implement a complete condition assessment programs for their road, bridges, water, and sanitary sewer networks. An example of this is to look at the roads and determine what ones need attention, then look at the water and sewer under the roads and determine what actions are necessary. Then look at the whole system or roads, water, and sewer and look for overlapping needs such as a road in need of repair and the watermains under the same road that needs to be replaced; then you have found a section that would be higher on the need scale than just a road in a similar condition without the watermain needs. This will lead to higher understanding of infrastructure needs, enhanced budget prioritization methodologies, and a clearer path of what is required to achieve sustainable infrastructure programs.

The basis of good asset management practice is founded on having complete and reliable information on the current condition of the infrastructure. Municipalities need to have a clear understanding regarding performance and condition of their assets, as all management decisions regarding future expenditures and field activities should be based on this knowledge. An inadequate understanding about an asset may lead to its premature failure or untimely replacement.

Some benefits of a complete condition programs within the overall asset management process are listed below:

- Understanding of overall condition leads to better management practices
- Allows for the establishment of rehabilitation programs
- Prevents future failures and provides liability protection
- Potential reduction in operation/maintenance costs
- Accurate current asset valuation
- Allows for the establishment of risk assessment programs
- Establishes proactive repair schedules and preventive maintenance programs

- Avoids unnecessary expenditures
- Extends asset service life therefore improving the level of service
- Improves financial transparency and accountability
- Enables accurate asset reporting which, in turn, enables better decision making

Condition assessment can involve different forms of analysis such as accepted opinion, failure prediction using engineering principles, materials testing, as well as other methods and can be completed through a very detailed or very cursory approach. When establishing the condition assessment of an entire asset class, the cursory approach (good, fair, poor, critical) is used. This will be a less-expensive approach when applied to hundreds of assets, but will still provide up to date information, and will allow for detailed assessment or follow up inspections on those assets captured as poor or failed condition later.

The following section outlines condition assessment programs used for road, bridge, sewer, and water systems that the Township has adopted.

FINANCIAL STRATEGY

General overview of financial plan requirements

In order for an AMP to be effectively put into action, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow Stirling-Rawdon to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service and projected growth requirements.

This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

The financial requirements for:

- Existing assets
- Exiting service levels
- Requirements of contemplated changes in service levels (in conjunction with resident surveys and public meetings)
- Requirements of anticipated growth

Use of traditional sources of municipal funds:

- Tax levies
- User fees

- Reserves
- Debt
- Development charges

Use of non-traditional sources of municipal funds

- Reallocated budgets
- Partnerships
- Procurement methods

Use of senior government funds:

- Gas tax
- Grants (not included due to Provincial requirements for firm commitments)

If the financial plan component of an AMP results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the validity of a funding shortfall, the Province may evaluate a municipality's approach to the following:

All asset management and financial strategies have been considered. For example:

- If a zero debt policy is in place, is it warranted? If not, the use of debt should be considered.
- Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.
- In order to reduce financial requirements, consideration has been given to revising service levels downward
- This AMP includes recommendations that avoid long-term funding deficits.

FINANCIAL INFORMATION for STIRLING-RAWDON'S AMP

Funding Objective

Funding scenarios have been formulated that would enable Stirling-Rawdon to achieve full funding within 5 or 10 years for the following assets:

- Tax funded assets – roads; bridges and culverts
- Rate funded assets –water; wastewater.

For each scenario developed we have included strategies, where applicable, regarding the use of tax revenues and reserves.

STRATEGY FOR FULL FUNDING

Tax Funded Assets

Roads & Bridge Assets

The average annual investment requirement for roads & bridges/large culverts is ***$1,815,911***. Revenue currently allocated to these assets is ***$1,369,650*** leaving an annual deficit of ***$446261***. To put it another way, these infrastructure categories are currently funded at 75.4% of their long-term requirements. The reserve funding for roads, bridges and large culverts has been set at 10% of the average annual investment required; which is an additional ***$181,591*** per year. The total for full funding of these two categories is ***$1,997,502*** including reserve funding.

Full funding would require:

- An increase in taxes of 1.8% for 2014 with further increases in future years.

Current funding position

Tables 1 & 2 outline, by asset category, Stirling-Rawdon's average annual asset investment requirements, current funding positions and funding increases required to achieve full funding on assets traditionally funded by taxes.

Table 1. Summary of Infrastructure Requirements & Current Funding Available

Reserve Funding per Year	2014 Annual Funding Available				Annual Deficit
	Tax/Rate	Gas Tax	Other	Total	
$118,856	37,440	187,200	50,000	274,640	1,069,705
$62,735	20,160	100,800	10,000	130,960	496,390
$181,591	***57,600***	***288,000***	***60,000***	***405,600***	***1,566,095***

Table 2. Overview of Revenue Requirements for Full Funding

Asset Category: Tax Funded	Tax/Rate Increase Required for Funding	Total Annual Revenue
	Taxes	Taxes
Roads	9.1%	$290,070
Bridges & Culverts	4.9%	$156,191
Total	***14%***	***$446,261***

The administrators recommend the 10 year option for roads, bridges and culverts assets. This involves full funding being achieved over 10 years by increasing roads by an average of ***0.9%*** per year and bridges and culverts increasing by an average of ***0.5%*** per year for 10 years.

The administrators recommend a plan implemented over 10 years. This involves full funding being achieved over 10 years by increases taxes according to the above tables in order to achieve full funding.

Although, increasing taxes immediately by the needed amount would alleviate the funding shortfalls, the Municipality over the previous number of years has not used progressive asset management strategies to achieve the desired results. Therefore, our Township will need to ramp up the rates and percentages over a number of years in order to achieve financial sustainability. The plan requires prioritizing capital projects to fit the resulting annual funding envelopes but it does provide financial sustainability at the 10 year point.

Rate Funded Assets

The Stirling-Rawdon asset management plan acknowledges the need for a user pay system to be applied to water and wastewater infrastructure.
When setting rates, the municipality takes the following factors into consideration:

- Conservation
- Fairness
- Rate and Revenue Stability
- Ease of Implementation
- Sustainability
- Economic Development

The Township of Stirling-Rawdon has been implementing a plan on rate funded assets since 2011.

Water Assets

The average annual investment requirement for water assets/maintenance is ***$750,000***. Revenue currently allocated to these assets is ***$440,000*** leaving an annual deficit of ***$310,000***. To put it another way, this infrastructure category is currently funded at 59% of its long-term requirements. The reserve funding for water has been set at 10% of the average annual investment required; which is an additional ***$75,000*** per year. The total for full funding of this category is ***$825,000*** including reserve funding.

Full funding would require:

- An increase in rates of 2% for 2014 with further increases in future years.

Sewer Assets

The average annual investment requirement for sewer assets is ***$1,266,800***. Revenue currently allocated to these assets is ***$630,000*** leaving an annual deficit of ***$636,800***. To put it another way, this infrastructure category is currently funded at 50% of their long-term requirements. The reserve funding for sewer has been set at 10% of the average annual investment required; which is an additional ***$126,680*** per year. The total for full funding of this category is ***$1,393,480*** including reserve funding.

Full funding would require:

- An increase in rates of 5% for 2014 with further increases in future years.

Tables 4 and 5 outline, by asset category, Stirling-Rawdon's average annual asset investment requirements, current funding positions and funding increases required to achieve full funding.

Table 4. Infrastructure Requirements vs. Current Funding Available

Asset Category Rate Funded	Average Annual Investment Required	2014 Annual Funding Available				Annual Deficit
		Rate Increase	Gas Tax	User Fee	Total	
Water	$825,000	$8,800	0	$440,000	$448,800	$376,200
Sewer	$1,393,480	$31,500	0	$630,000	$661,500	$731,980
Total	***$2,218,480***	***$40,300***	***0***	***1,070,000***	***$1,110,300***	***$1,108,180***

Table 5. For Full Funding

Asset Category Rate Funded	Tax/Rate Increase Required for Full Funding	Total Annual Revenue
	Rates	Rates
Water	16% increase	$510,400
Sewer	50% increase	$945,000

*please note includes capital and maintenance

As illustrated in table 5, full funding will require water revenue to be increased by 16% over time and sewer revenue to be increased by 50% over time.

Table 6 outlines options to phase in the revenue requirements over five years or ten years:

	5 Years	10 Years	Ongoing
Water	3.2%	1.6%	Inflation
Wastewater	10%	5%	Inflation

The administrators recommend the 10 year option for water and sewer assets. This involves full funding being achieved over 10 years by increasing water by an average of ***1.6%*** per year and sewer increasing by an average of ***5%*** per year for 10 years.

The administrators recommend a plan implemented over 10 years. This involves full funding being achieved over 10 years by increases rates and taxes according to the above tables in order to achieve full funding.

Although, increasing rates immediately by the needed amount would alleviate the funding shortfalls, the Municipality over the previous number of years has not used progressive asset management strategies to achieve the desired results. Therefore, our Township will need to ramp up the rates over a number of years in order to achieve financial sustainability. The plan requires prioritizing capital projects to fit the resulting annual funding envelopes but it does provide financial sustainability at the 10 year point.

For reference purposes, table 7 outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0% over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not take into account the time value of money or the effect of inflation on delayed projects.

Table 7

Interest Rates	***Number of Years Financed***					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.53%	2%	3%	4%	5%	7%	8%
0.03%	0%	0%	0%	0%	0%	0%

Current interest rates are near all-time lows. Our sustainable funding model includes short term debt and the risk of rising interest rates needs to be taken into account.

Council Notes

The Township of Stirling-Rawdon Council is in agreement with this document, but would like to put on record that the funding currently available from the upper tiers of government is insufficient for the responsibilities undertaken from the municipality. All kilometers of roadway in the municipality is under Stirling-Rawdon`s care as there is no county roads system, and no provincial roads. This is unusual in that the vast majority of municipalities with this many lane kilometers of roadway shares responsibilities with some form of upper tier government. Our arterial roads, 14, 38, 8, and 19 were in their earlier lives either county roads of provincial highways.

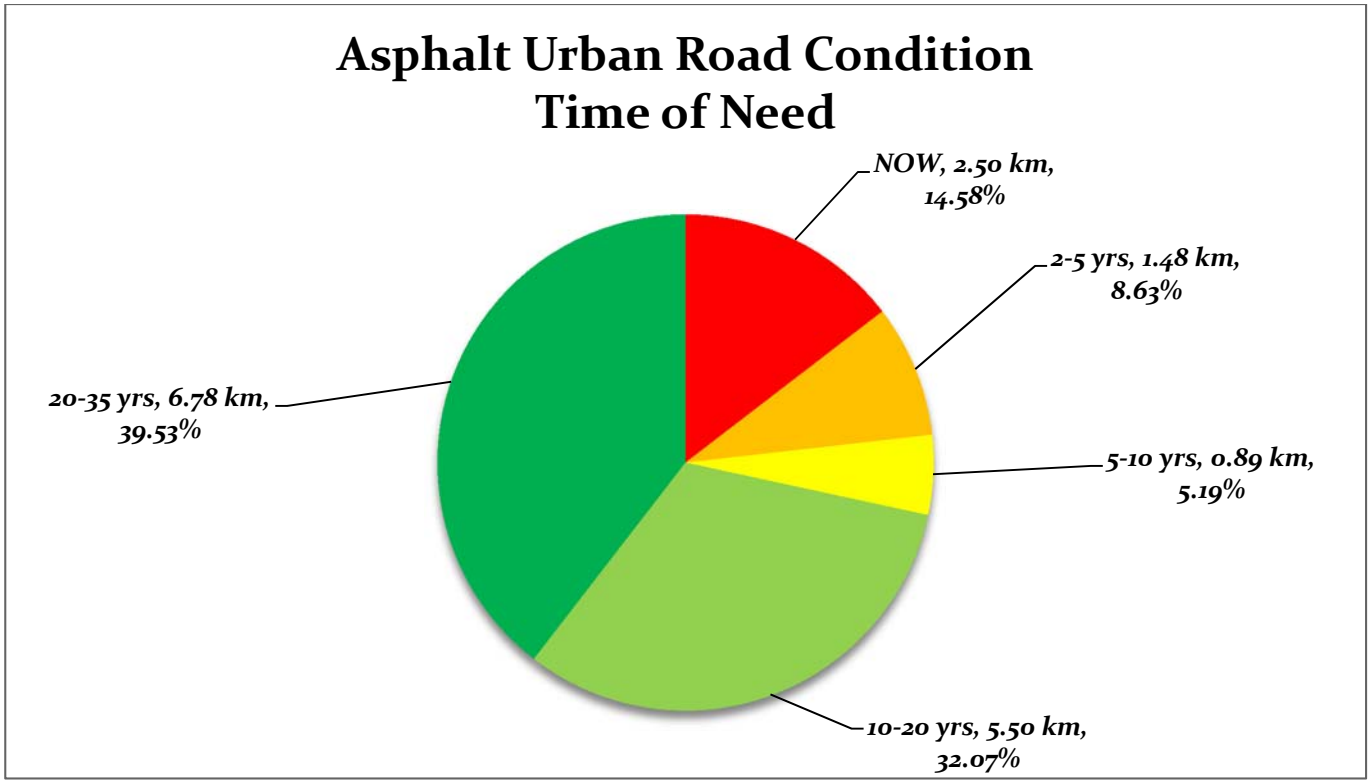
The Council of the Township of Stirling-Rawdon would welcome any funding assistance that could be provided by the upper tiers of government to help reduce our infrastructure deficit.

Thank You.

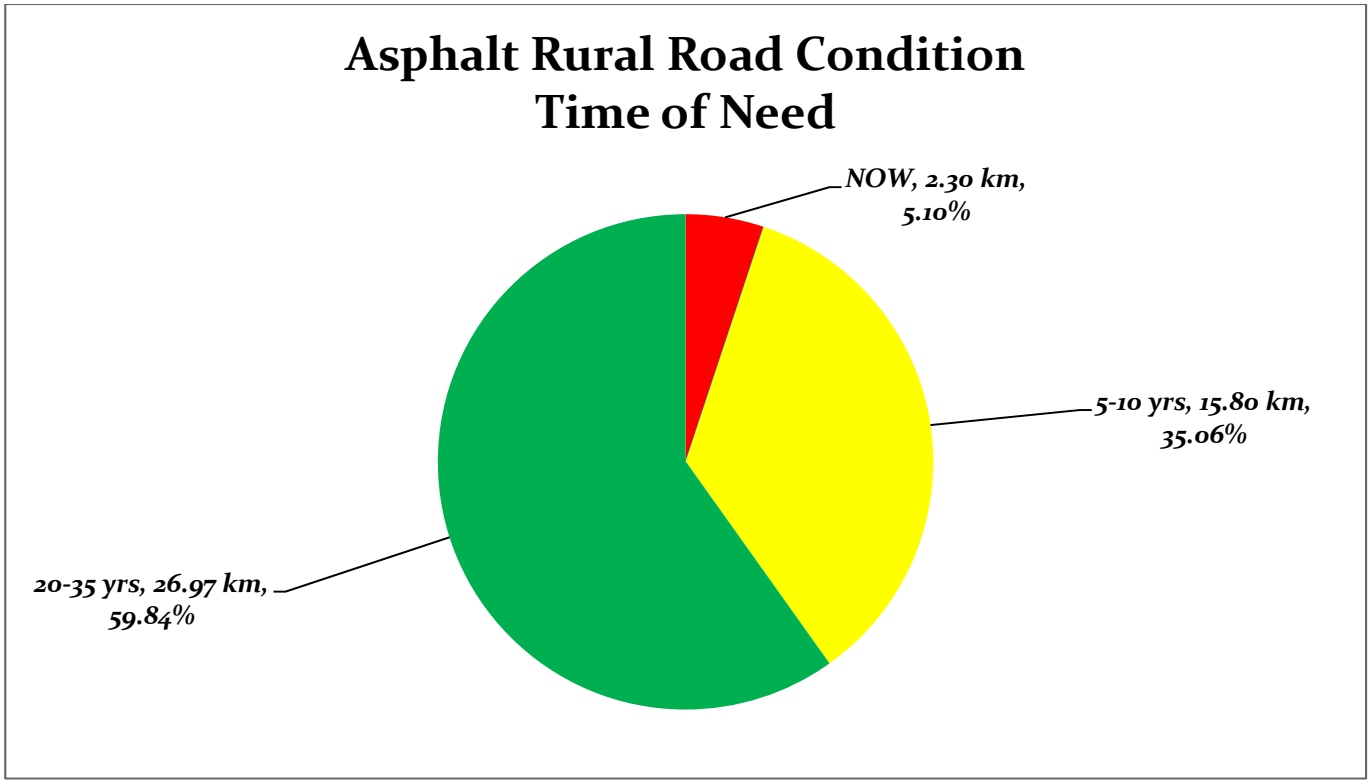
Stirling-Rawdon Asset Management Plan Updates 2016

Appendix 1 Updated Road and Bridge Data
Appendix 2 Fleet
Appendix 3 Building
Appendix 4 Storm Water Management

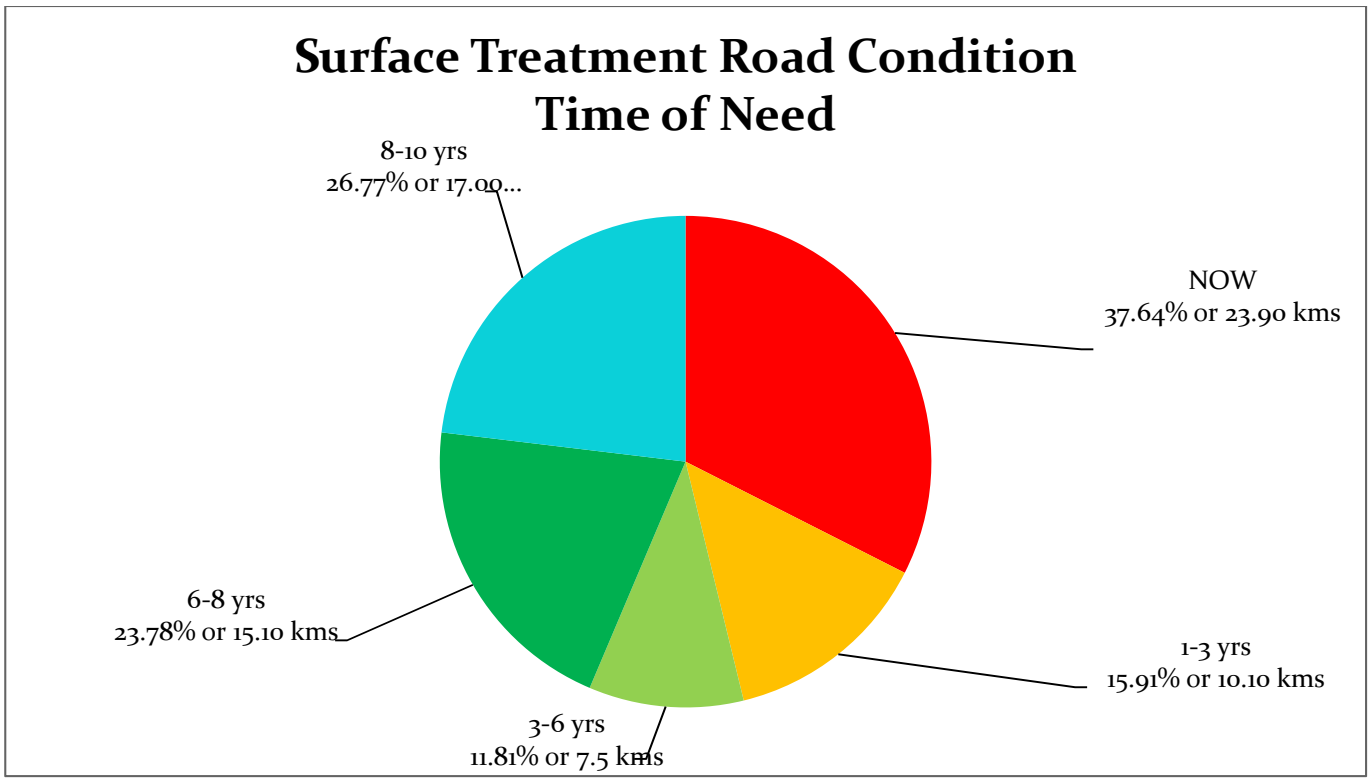
Appendix 1 – Updated Road and Bridge Data



Time of Need	# Roads	Percent	Kms
NOW	3	14.58%	2.50
2-5 yrs	4	8.63%	1.48
5-10 yrs	5	5.19%	0.89
10-20 yrs	11	32.07%	5.50
20-30 yrs	17	39.53%	6.78
Totals	40	100.00%	17.15

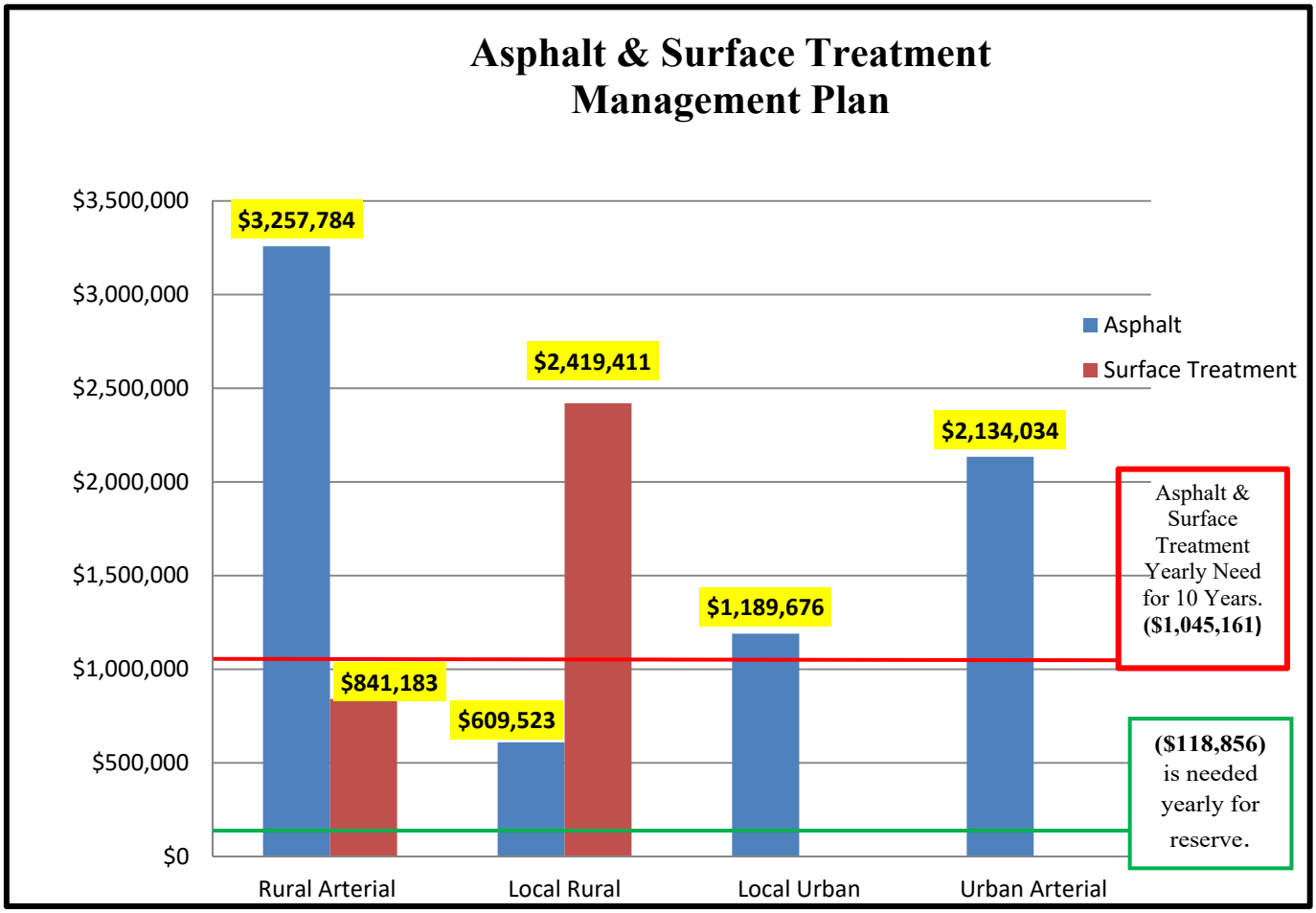


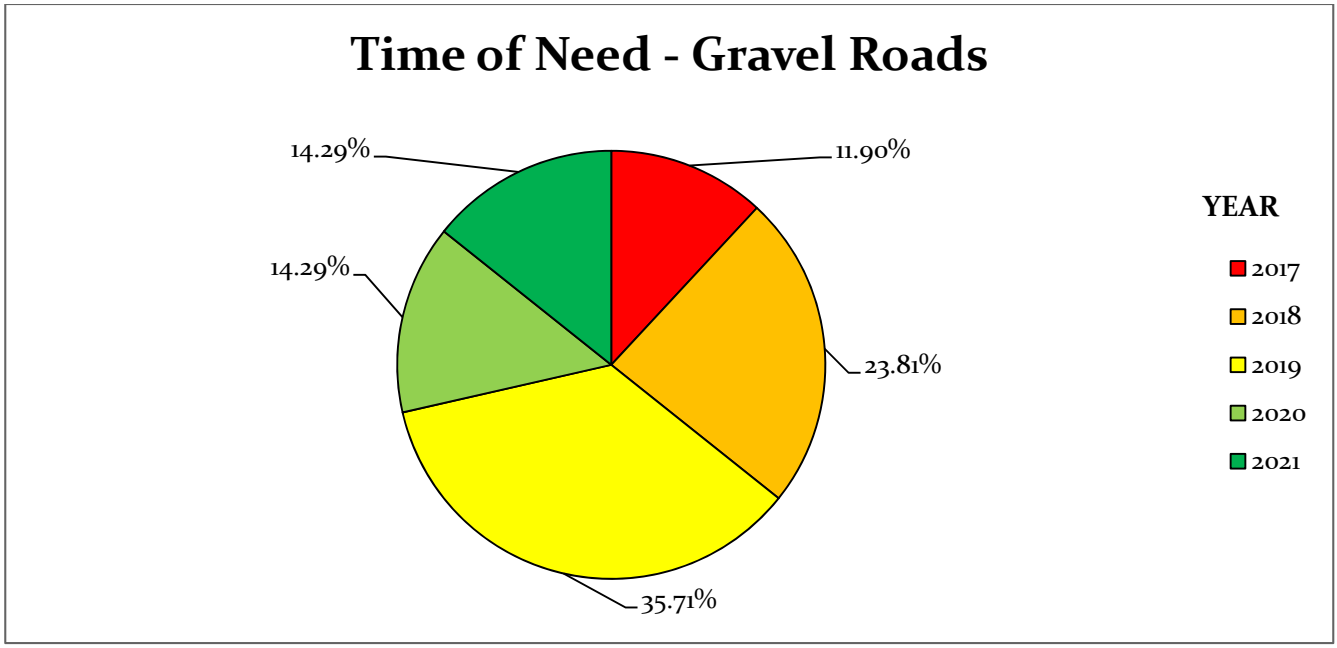
Time of Need	# Roads	Percent	Kms
NOW	1	5.10%	2.30
2-5 yrs	0	0.00%	0.00
5-10 yrs	2	35.06%	15.80
10-20 yrs	0	0.00%	0.00
20-35 yrs	3	59.84%	26.97
Totals	6	100.00%	45.07



Time of Need	# Roads	Percent	Kms
NOW	5	37.64%	23.90
1-3 yrs	2	15.91%	10.10
3-6 yrs	2	11.81%	7.50
6-8 yrs	4	23.78%	15.10
8-10 yrs	3	26.77%	17.00
Totals	14	100.00%	63.50

No adjustment made to the actual dollars needed, as the Township still requires these dollars to help with the infrastructure deficit and to completely pay the debt off for Ridge Road.

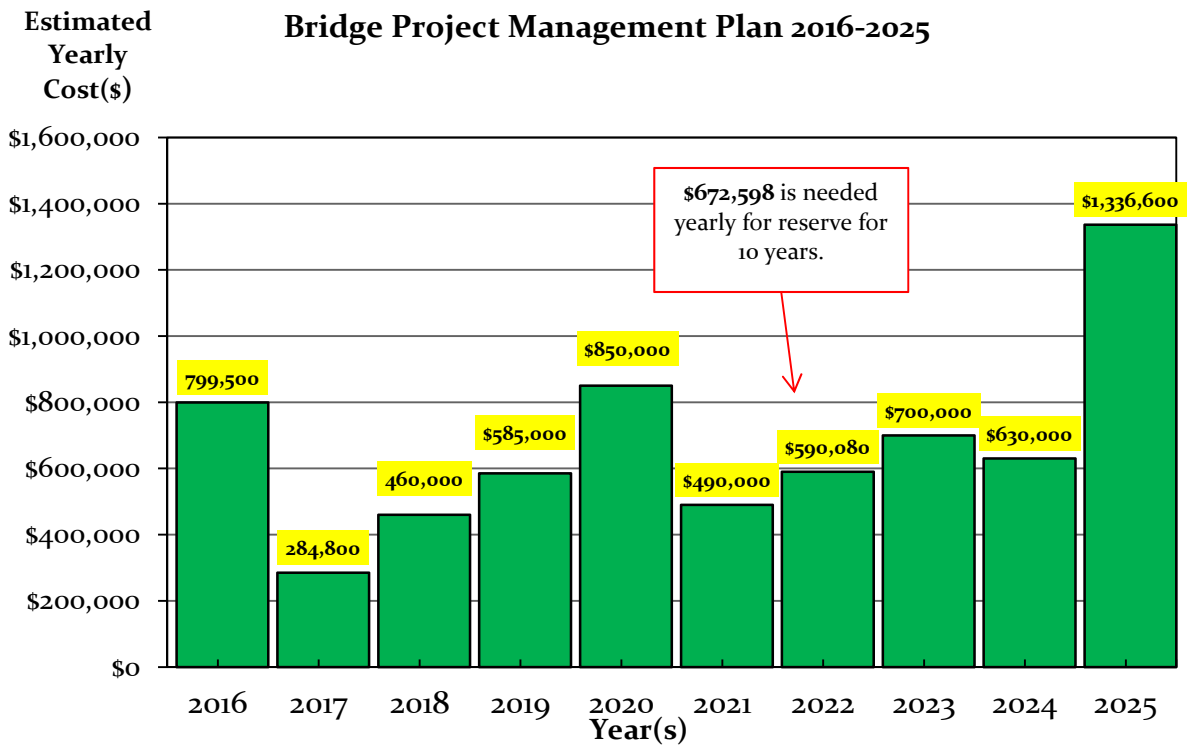




Year	# of Roads	Percent	KM
2017	5	11.90%	17
2018	10	23.81%	16.7
2019	15	35.71%	20.6
2020	6	14.29%	16.1
2021	6	14.29%	13.9
Total	42	100.00%	84.3

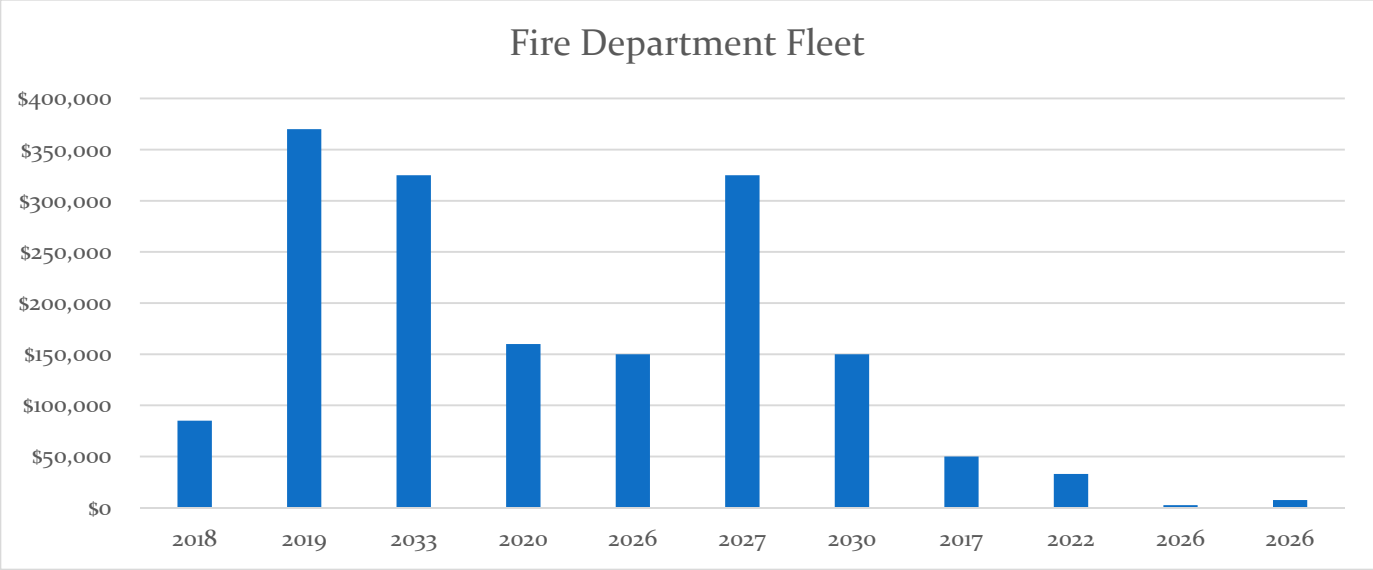
The Township to meet the needs based on the conditions completed in 2016 will need to commit $150,000 yearly for a 10 year management plan.

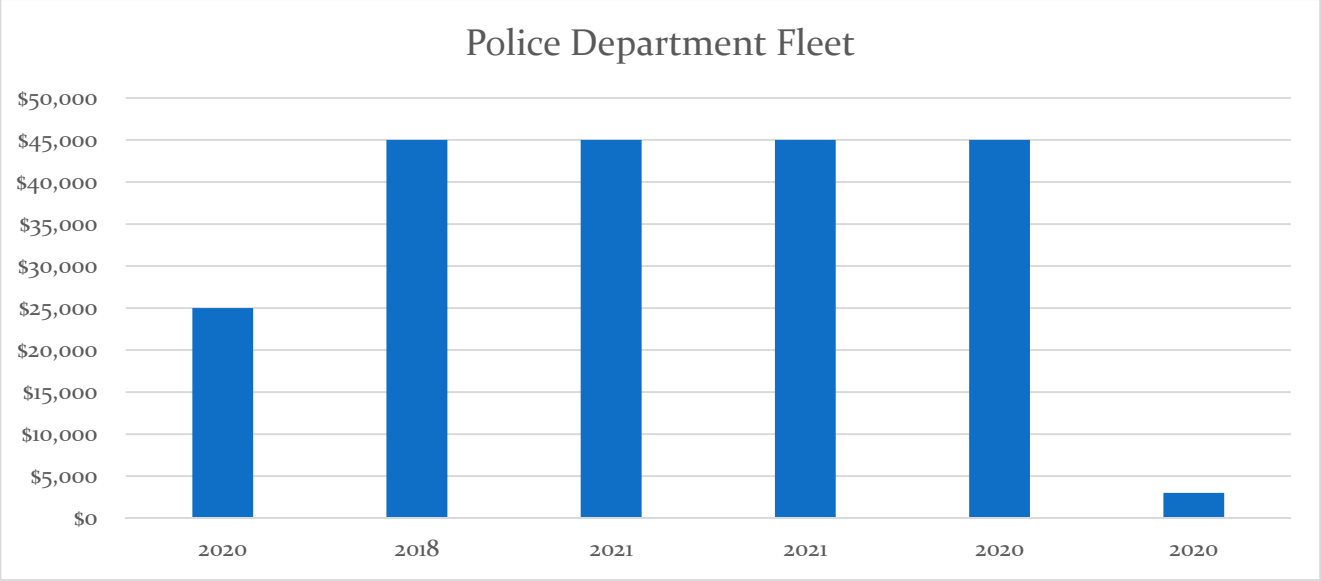
The below chart is updated to match our OSIM report for 2015 and the Township is faced a significant cost to maintain and/or replace the bridges within our Municipality. The Township feasibly will only be able to contribute $70,000 per year to reserve, thus leaving a huge infrastructure deficit to overcome.

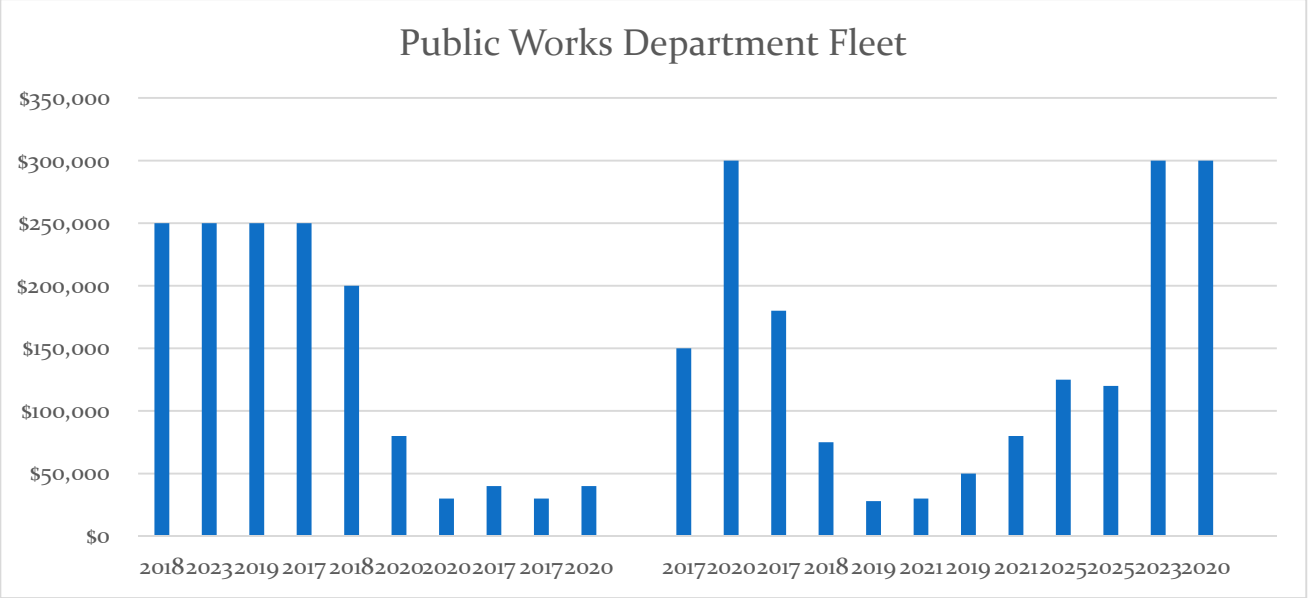


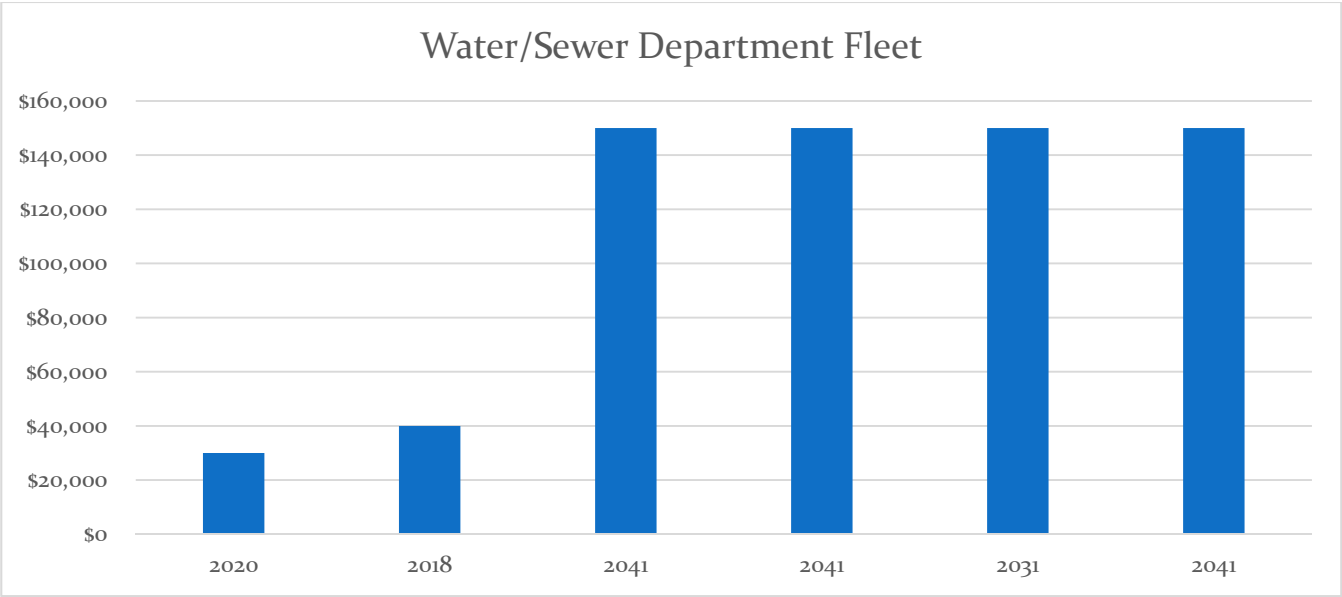
Appendix 2 – Fleet

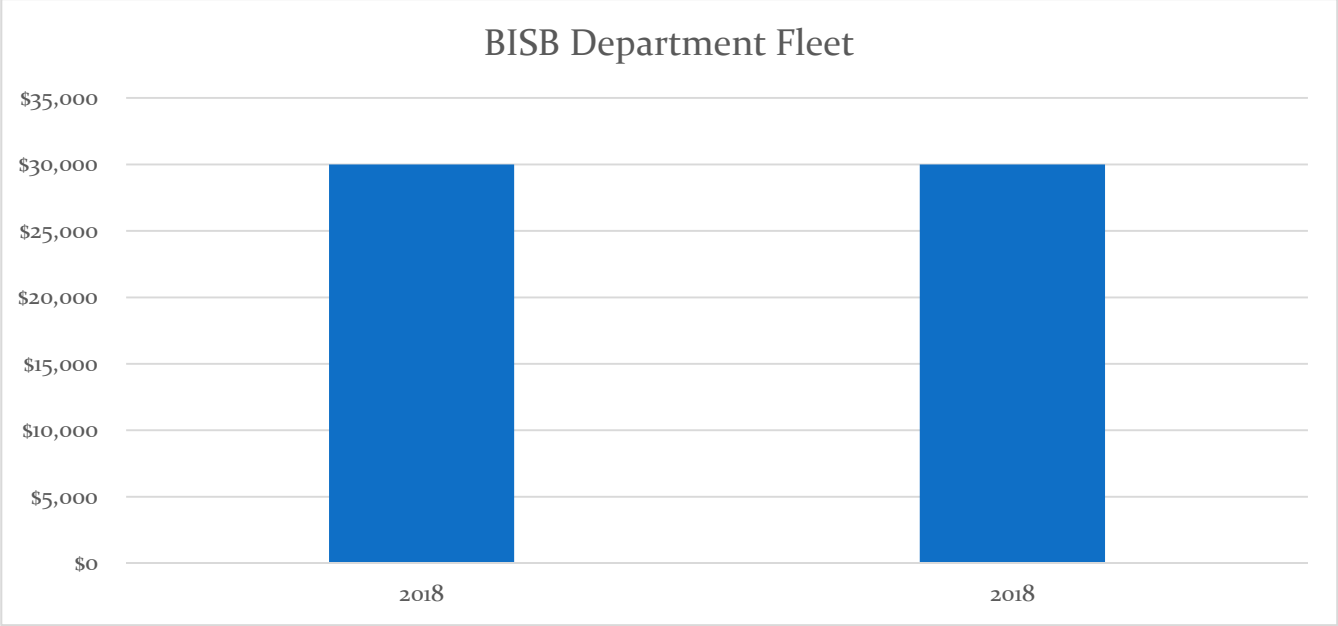
The Township usually tries to update their fleet between 5 to 30 years depending on the type of vehicle/equipment. As the charts below show the dollars that will be required each year by department, the first four years there is significant dollars required if we were update each item. With being a small urban/rural municipality with mainly a residential tax base and owning all roads with no provincial highways, the Township will have to prioritize the fleet dollars over the next 25 years and try to commit $240,000 per year to bring fleet up to date.




Police Department Fleet
$50,000
$45,000
$40,000
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
2020
2018
2021
2021
2020
2020


Public Works Department Fleet
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
2018 2023 2019 2017 2018 2020 2020 2020 2017 2017 2020
2017 2020 2020 2017 2018 2019 2021 2019 2021 2025 2025 2023 2020

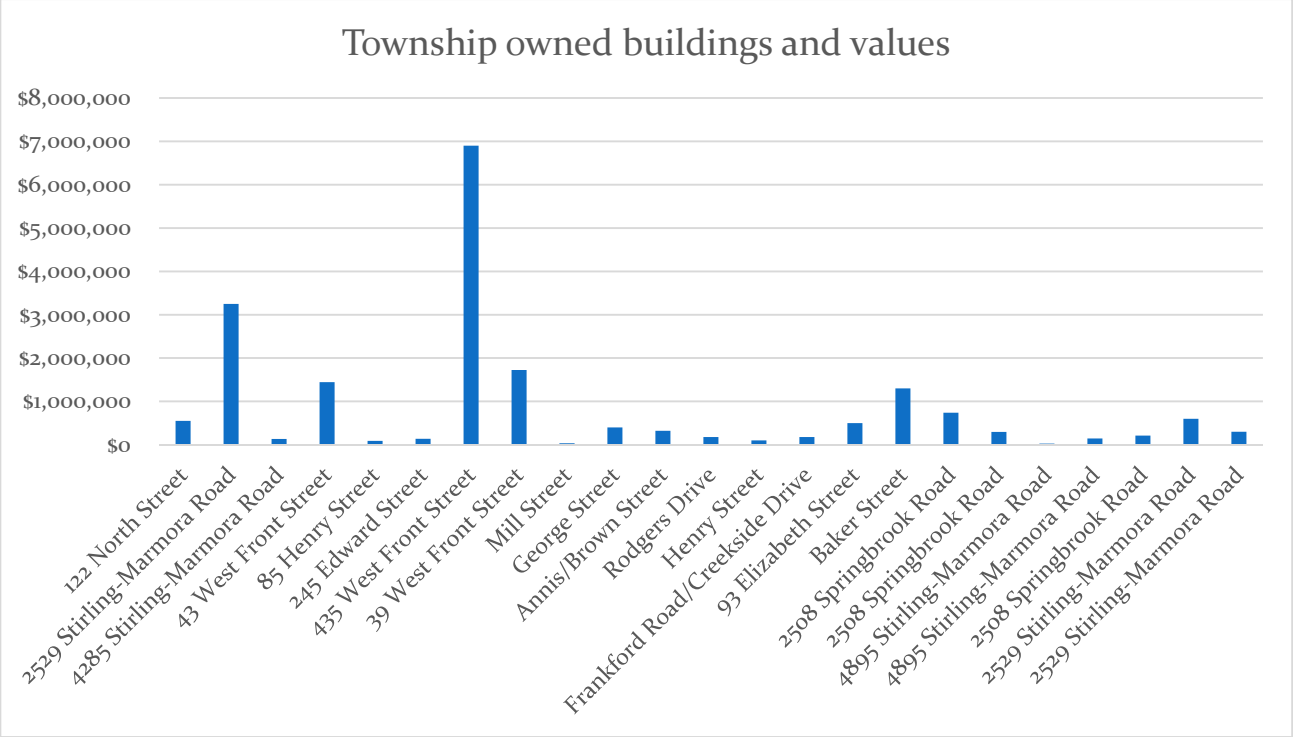

Water/Sewer Department Fleet
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
2020
2018
2041
2041
2031
2041


BISB Department Fleet
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
2018
2018

Buildings as of 2016

Building	Location	Value
Former CN Station	122 North Street	$552,000
Police/Fire/Municipal Offices	2529 Stirling-Marmora Road	$3,250,000
Harold Township Hall	4285 Stirling-Marmora Road	$133,000
Library	43 West Front Street	$1,445,000
Concession Booth & Shelter	85 Henry Street	$90,000
Chapel/Vault	245 Edward Street	$136,300
Arena and Curling club	435 West Front Street	$6,900,000
Theatre/Community Centre	39 West Front Street	$1,725,000
Covered Bridge	Mill Street	$35,000
George Street Pumping Station	George Street	$400,000
Annis Street Pumping Station	Annis/Brown Street	$321,000
Rodgers Drive Pumping Station	Rodgers Drive	$177,000
Henry Street Pumping Station	Henry Street	$100,000
Frankford Road Pumping Station	Frankford Road/Creekside Drive	$177,000
Main Well House	93 Elizabeth Street	$500,000
Water Tower	Baker Street	$1,300,000
Public Works Building/Fire Hall	2508 Springbrook Road	$740,000
Township Hall	2508 Springbrook Road	$295,000
Dressing Room	4895 Stirling-Marmora Road	$27,000
Washroom/Canteen	4895 Stirling-Marmora Road	$144,500
Salt/Sand Dome	2508 Springbrook Road	$210,000
Public Works building	2529 Stirling-Marmora Road	$598,000
Salt/Sand Dome	2529 Stirling-Marmora Road	$300,000
		$19,555,800

Lifespan for Buildings is usually 75 years $ needed per year to replace all $ 260,744.00


Township owned buildings and values
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$0
122 North Street
2529 Stirling-Marmora Road
4285 Stirling-Marmora Road
43 West Front Street
85 Henry Street
245 Edward Street
435 West Front Street
39 West Front Street
Mill Street
George Street
Annis/Brown Street
Rodgers Drive
Henry Street
Frankford Road/Creekside Drive
93 Elizabeth Street
Baker Street
2508 Springbrook Road
2508 Springbrook Road
4895 Stirling-Marmora Road
4895 Stirling-Marmora Road
2508 Springbrook Road
2529 Stirling-Marmora Road
2529 Stirling-Marmora Road

Appendix 4 – Storm Water Management Plan

The Township has 325 storm water drains in Stirling and Springbrook. To update these drains we are estimating approximately $30,000 per drain depending on the other infrastructure that might be affected.

In the spring of 2017 there will be a complete review of our Storm Water Management system which will enable us to update this portion of our Asset Management Plan.

At the present time we have an area within Stirling that is top priority which we have estimated to cost approximately $2,300,000.00 to reconstruct. We also have a storm water area within Springbrook to update/upgrade at an estimated cost of $40,000.