INFRASTRUCTURE SOLUTIONS INC.

Asset Management Plan 2016-2025

Township of White River

WHITE RIVER ONTARIO

Project No. 16-319

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1 EXECUTIVE SUMMARY

The Township of White River is undertaking a detailed evaluation of all its existing infrastructure in order to update a long-term Asset Management Plan, put the Township in a position to receive the Federal Gas Tax Fund and other grants, and build a fully implementable program for its residents which aims to further strengthen municipal asset management practices.

Asset management planning requires that the most cost effective and realistic decisions are made regarding the building, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The prime goal of the Asset Management Plan is to maximize benefits, manage risk, and offer satisfactory, safe and sustainable service levels to the public. Asset management planning requires that the Township has an in-depth understanding of the characteristics and condition of infrastructure assets, as well as the service levels they are expected to meet. Asset management planning also involves strategic prioritization and optimization to obtain the best decision-making concerning the timing and utilization of investments, which includes a comprehensive and achievable financial strategy.

Infrastructure Solutions Inc. was well supported by White River's staff to accumulate the Township's geometric and condition assessment data, where available. We based the Asset Management Plan on all asset types and their current replacement costs. Asset lifespans, condition and project requirements were determined by engineering assessments and degradation curves. Where condition assessments were unavailable, ISI applied an age-based analysis. Our objective was to build a practical asset management plan based on optimizing the capital spend and taking corrective action to address the Township's infrastructure deficit.

The Township's infrastructure deficit is defined as the added investment that would be required to maintain a Township's infrastructure at appropriate service levels and in a good state of repair today. Based on our calculations, White River's infrastructure deficit is calculated to be $10.1 million dollars. The Township's infrastructure deficit is serious, requiring a $1.4 MM annual contribution to eliminate it within a 10-year period, which is well outside the Township's current financial capability.

The greatest portion of the infrastructure deficit (64.6%) is with the roads. We have analyzed this road network in detail with the objective of optimizing how capital is expended. Independent of the deficit, we have reviewed the Township's current/projected capital contributions in relation to its current/projected needs. The Township is currently contributing $122,953 per annum to its capital program but has a requirement to contribute $294,617 per annum. Without corrective action, the infrastructure deficit will continue to grow. As highlighted in the SOTI Report within this document, the Township's roads are in poor condition, while the Township's other major linear assets, the water/wastewater systems, are generally in fair condition.

2 HISTORICAL OVERVIEW

Municipal infrastructure is the foundation that the daily life of Canadians is built upon. The strength of this foundation enables our communities and local businesses to grow and it ensures that Canadians have a high quality of life. Municipalities own the core infrastructure assets that are critical to the quality of life of Canadians and the competitiveness of our country. Almost 60% of Canada's core public infrastructure is owned and maintained by municipal governments. According to survey results, the total value of core municipal infrastructure assets is estimated at $1.1 trillion dollars or about $80,000 per household.

The delivery of essential public services is reliant on a strong foundation of municipal infrastructure. This foundation enables our communities and local businesses to grow and ensures Canadians can lead safe and healthy lives. The Township of White River is not alone in dealing with an infrastructure deficit. According to the Canadian Infrastructure Report Card (CIRC), one-third of our Canadian municipal infrastructure is in fair, poor or very poor condition, increasing the risk of service disruption. Assets in fair, poor and very poor conditions represent a call for action. Survey results demonstrate that roads, municipal buildings, sport and recreation facilities and public transit are the asset classes most in need of attention. Figure 1 provides a summary of the physical condition ratings for all municipal asset categories across the country.

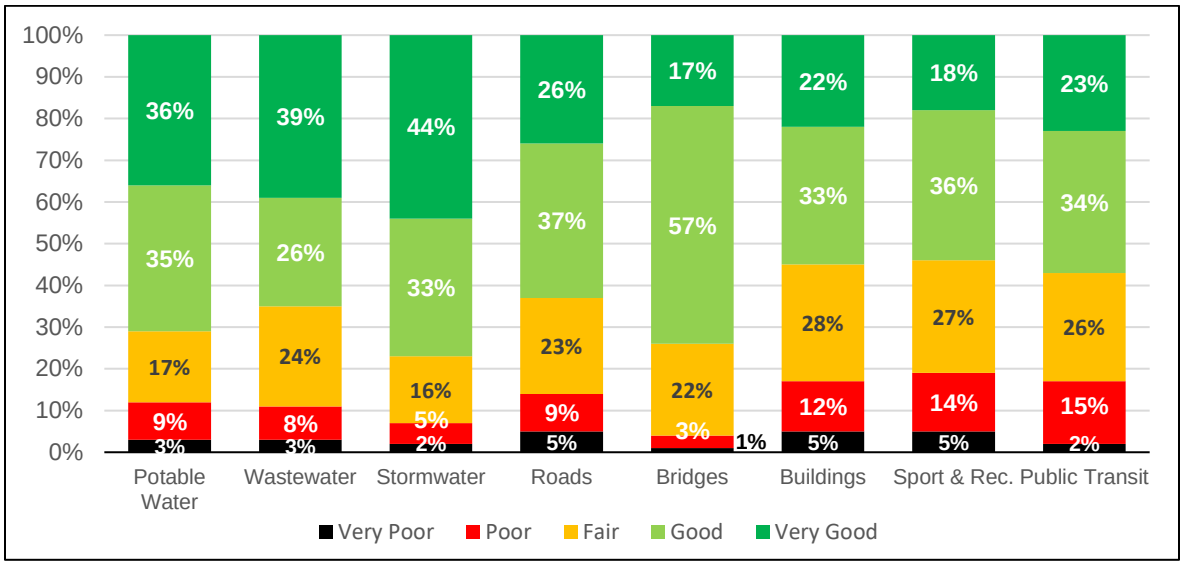


Figure 1: Physical Condition Ratings by Asset Category

Increasing reinvestment rates will stop the deterioration of municipal infrastructure. The 2016 CIRC report found that rates of reinvestment are lower than targets recommended by asset management practitioners. The rate can vary based on factors such as the age of the infrastructure, the level of service and risk tolerance. The values provided are based on the experience of municipal asset management practitioners and are intended to be informative in nature. Roads and sidewalks, storm water, and sport and recreation infrastructure presented the largest gaps in terms of current and target rates of reinvestment. Figure 2 demonstrate the gap between current and target reinvestment levels. Continuing down this path will result in a gradual decline of physical condition levels that will impact municipal services. When contrasted with target reinvestment rates it becomes clear that current levels of reinvestment in municipal infrastructure are inadequate.

Target Reinvestment Rates vs Current Reinvestment Rate

Infrastructure	Lower Target Reinvestment Rate	Upper Target Reinvestment Rate	Current Reinvestment Rate
Potable Water (linear)	1.0%	1.5%	0.9%
Potable Water non-linear)	1.7%	2.5%	1.1%
Wastewater (linear)	1.0%	1.3%	0.7%
Wastewater (non-linear)	1.7%	2.5%	1.4%
Stormwater (linear)	1.0%	1.3%	0.3%
Stormwater (non-linear)	1.7%	2.0%	1.3%
Roads and Sidewalks	2.0%	3.0%	1.1%
Buildings	17.0%	2.5%	1.7%
Sport and Recreation	1.7%	2.5%	1.3%

Figure 2: Target Reinvestment Rates vs Current Reinvestment Rate

3 OUR METHODOLOGY

Infrastructure Solutions is an "accountineering" company, half civil engineers, half financial planners. Building an implementable Asset Management Plan requires both civil engineering and financial planning expertise. Working with smaller municipalities is our only business. We understand that every municipality is unique with its objectives and priorities, so our analytical process involves feedback from Public Works and Treasury. Our objective is to build asset management plans that are practical and implementable. Our intention is to deliver a plan that White River can manage and that its Council and community can embrace.

Under the MIII program in 2013 - 2014, we wrote 60 Asset Management Plans, primarily focused on identifying the infrastructure deficit and required capital contribution. We got frustrated telling Councils that they had big deficits, an over-taxed population, and no hope of getting their infrastructure deficits under control without provincial or federal grants. Since 2014, to promote municipal self-sufficiency, we have been building capital planning and optimization tools to maximize the positive impact of municipal spending.

We have been supported in our efforts to build capital planning tools by the Ontario Centers of Excellence (OCE) and NSERC grants through the Civil Engineering department at the University of Waterloo. Our "Better Capital Planning" workshop was delivered at the Municipal Finance Officer's Annual Conference (Collingwood, ON) in Sept. 2015, and the Ministry of Municipal Affairs' Northern Treasurer's Forum in (Sudbury, ON) in Oct. 2015. Most recently, we presented road maintenance, rehabilitation, and reconstruction strategies at the Municipal Engineers Association (MEA) AGM. ReNew Canada (Nov. 2016 issue) magazine and Municipal World magazine (Dec. 2016 issue) published articles about our development of capital planning tools for smaller municipalities.

To enhance our capital planning tools and maximize the accuracy of our long-range projections, we developed a comprehensive Municipal Cost Index (MCI) based on a micro-analysis of municipal costs. It includes a weighting of the expenditure categories and the inflation factor used for each municipal component. We match an appropriate inflator to the types of expenditures in each budget category.

3.1 ISI ROAD SURVEY

This year, Infrastructure Solutions Inc. conducted the most comprehensive Canadian survey of municipal road maintenance practices ever undertaken. The 171 survey participants represented 45,000 km of paved road, 15% of Canada's population, and a wide range of municipalities by region and population. The survey was designed to identify the extent to which municipalities apply preventive maintenance treatments, to attain practical observations about treatment options and lifecycle gains, and clarify user perceptions about what constitutes best road maintenance practices. The results are truly disturbing.

The survey established that 98% of respondents perceive preventive maintenance as an important and cost-effective approach to extend the service life of their pavements and to save the municipality significant capital investment in the long run. The survey further establishes that a majority of the municipalities do not apply preventive maintenance treatments (Figure 3) and have a widely-varied understanding of when these treatments should be applied.

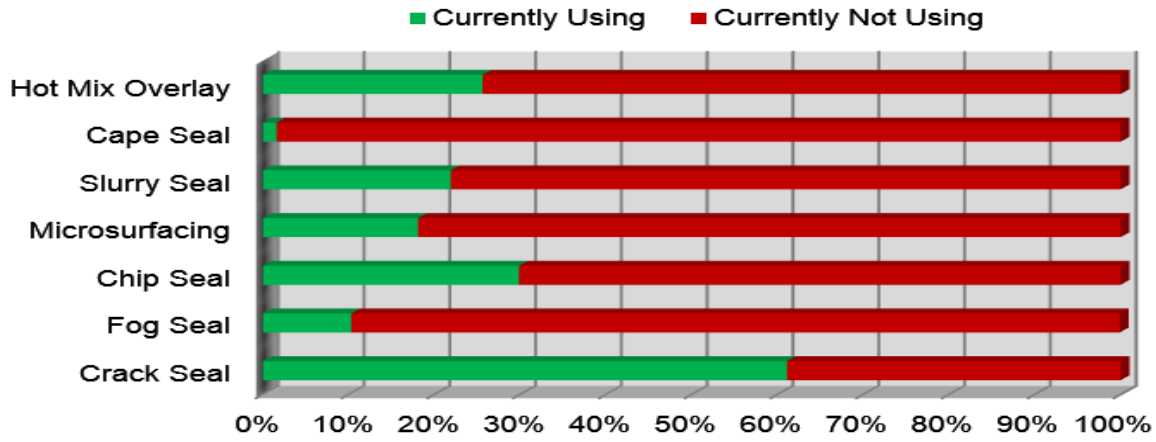


Figure 3: Current Application of Preventive Maintenance Across Canadian Municipalities

Respondents were asked what percentage of their municipality they believe is currently being maintained according to best practices. Figure 4 shows the survey's cumulative response on the application of chip seal, micro-surfacing, and slurry seal to paved roads. For every major surface treatment type, less than 20% of municipal road networks are maintained in accordance with what respondents believe to be best practice.

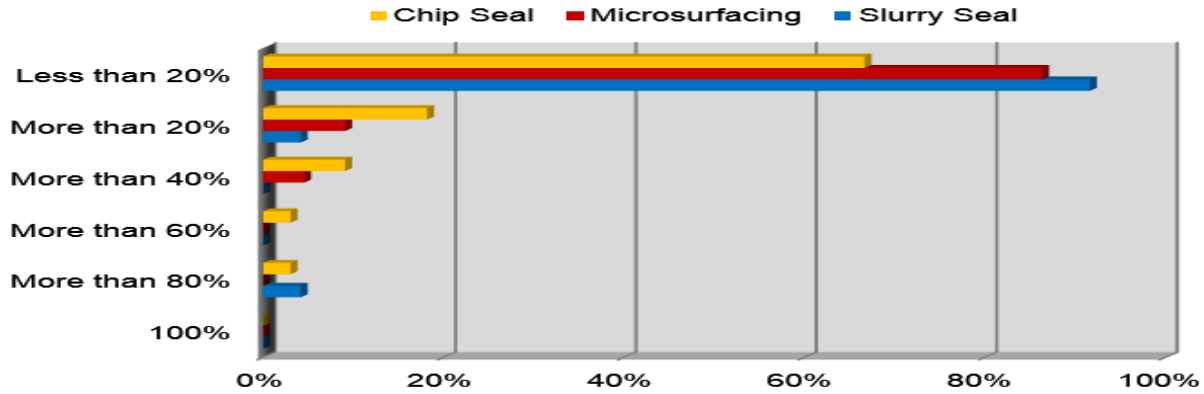


Figure 4: Application of Preventive Treatments According to Best Practices

This contradiction between the clearly appreciated benefits of preventive maintenance and the inadequate application of preventive treatments in practice has deep roots. Municipalities may be overly reactive to community requests. Councils surely follow the advice of Roads Needs Studies, where engineering companies recommend repairing worst roads first for safety and other reasons, assuming an unlimited municipal budget. Deteriorated water or wastewater lines might necessitate road reconstruction for line replacement and take precedence over maintenance. Smaller municipalities often use Excel or simplistic pavement management programs which typically recommend projects based on a simple ranking process. Finally, many municipalities still operate on an ad hoc basis, arbitrarily selecting roads which need rehabilitation or reconstruction work without undertaking any analytical process whatsoever. Whatever the circumstance, tax dollars are being poured into pot holes unnecessarily.

Our capital planning tool provides a robust decision-making process, identifies the best possible course of action, and considers both the short-term needs and the long-term goals of a municipality. It includes an advanced decision-making process called optimization or prescriptive modeling, which is the most powerful and effective way of finding the best possible solution to a decision-making problem. A capital planning tool with optimization capability can maximize the overall performance of a network in terms of physical condition (or any other criteria) over a multi-year analysis horizon and provides municipalities with the best possible course of action in terms of timing and selection of different maintenance, rehabilitation, or reconstruction treatments considering all municipal goals and constraints. The improvements achieved through an optimized solution, which inevitably highlights the critical importance of preventive maintenance, can be translated into substantial savings and increased socio-economic benefit (Figure 5).

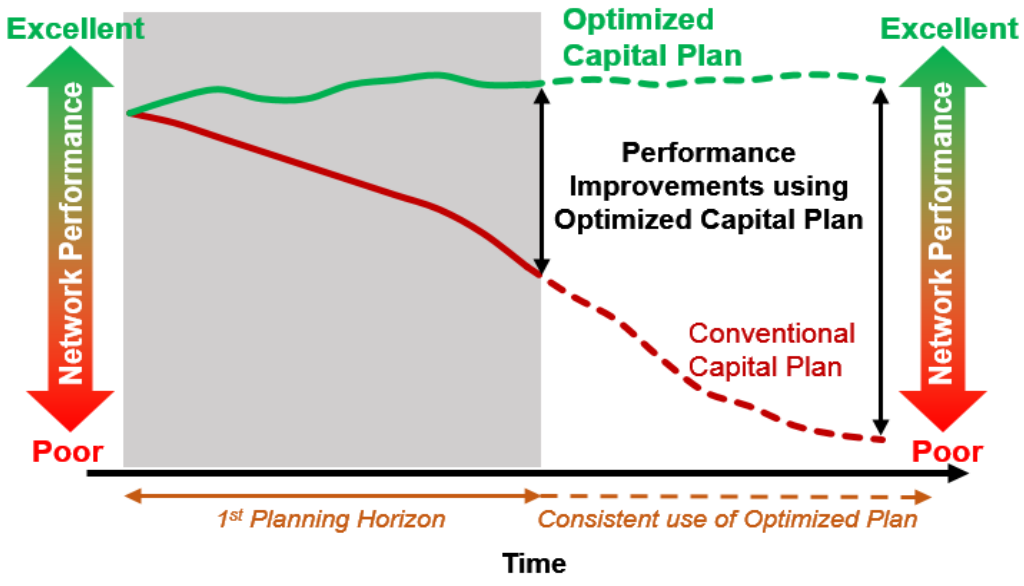


Figure 5: Optimized vs. Conventional Capital Planning

Combining advanced optimization capabilities with robust engineering models and socio-economic consideration provides municipalities with a fully implementable and defensible road network capital plan. The analytical models used in the system are flexible, able to adjust to regional variances and reflect the behavior of assets verified through a rigorous engineering analysis.

4 SOTI REPORT

This State of the Infrastructure (SOTI) assessment is based on an analysis of the replacement, rehabilitation, and maintenance requirements of the Township's asset inventory and its current condition. Infrastructure Solutions has been contracted to assist the Township in analyzing the State of the Infrastructure Report (SOTI) and the assembly of a Capital Plan as the initial components of a comprehensive Asset Management Plan. We include a Report Card on the current state of the major linear assets within the Township. The Capital Plan provides both a high-level assessment of projected Capital expenses and a detailed future project by project costing for the Township's review and confirmation. Our objective is to give the Township the analytical tools and information necessary to implement a comprehensive and cohesive asset management program. We have determined that the Township has a significant backlog of assets in need of betterment or replacement.

Dealing with aging infrastructure requires that the Township assesses the long-term capital project requirements and establish the funding of high-priority projects in an efficient, timely and cost-effective manner. With our engineering analysis and project identification, the Township can monitor, track and manage infrastructure assets to ensure that policy makers obtain sufficient funding in order to maintain, at a minimum, and potentially enhance future service levels. Through capital budgeting, the Township of White River can plan the future operating budget expenses and reserve funds to manage its financial position over a long-term period. Capital planning provides the core information needed for the Council's planning and fiscal policies.

The Report Card produced within the SOTI has been developed to provide an easily understood reference that can be regularly updated to document investment gaps and the progress that the Township is making towards sustainability. The SOTI and associated analysis are strategic documents that identify trends and highlight possible issues involved in delivering services and maintaining the assets for those services. The SOTI will also assist in the development of more detailed tactical and operational plans aimed at identifying expenditures needed to provide service in a cost-effective, sustainable manner.

Encapsulated within this report ISI presents the Township's State of the Infrastructure report (SOTI), and a description of our methodology. The final Capital Plan contains a more detailed asset data and calculation process. The direction of this project was influenced by the Township's requirement for an Asset Management Plan and the work of the National Guide for Sustainable Municipal Infrastructure. In November 2003, the National Guide to Sustainable Municipal Infrastructure published a Best Practice for Municipal Infrastructure Asset Management. It stated that the framework for an asset management plan can be described in terms of seven questions:

1. What do you have and where is it? (Inventory and Location)
2. What is it worth? (Costs/Replacement Rates)
3. What are its condition and expected remaining service life? (Condition and Capability)
4. What is the service level expectation and what needs to be done? (Capital & Operating Plans)
5. When do you need to do it? (Capital and Operating Plans)
6. How much will it cost and what is the acceptable level of risk? (Short/Long-term Financial Plan)
7. How do you ensure long-term affordability? (Short- and Long-term Financial Plan)

This report answers these questions.

5 INVENTORY AND THE VALUATION OF ASSETS (SOTI)

The aim of this section of the report is to provide an overview of the State of the Infrastructure (SOTI) by an analysis of the available data on the condition and/or age of the Township's assets. The SOTI requirements are restricted to linear assets only. Within the Capital Plan, ISI has included other critical asset types in its analysis for the Township's review. The grouping of these assets and asset replacements were taken from the PSAB files provided by the Township, and the current replacement value of the assets is comprised of these factors:

- Value of all the existing assets
- New assets
- Adjustments in unit costs based on improved knowledge and inflationary impacts
- Based on the TCA Policy, a **$5,000 capital threshold limit** is used for the majority of the assets, while higher threshold limits are specified for buildings and pooled assets. Any assets below the threshold have not been accounted for in the capital plan.
- The Useful Life criteria for the various asset categories were applied in the analysis as per the Township's TCA policy.

For the purpose of the Asset Management Plan report, we have grouped the assets as follows:

Linear Assets:

- Water Network
- Sewer Network
- Roads – Paved and Gravel

Non-linear assets have been dealt with in the Capital Plan:

- Street Lights
- Buildings
- Vehicles
- Sign
- Recreation
- Parking Lots
- Equipment

Assets Type	Replacement Cost
Water Network	$17,791,605
Sewer Network	$10,609,824
Roads	$9,270,999
Street Lights	$215,248
Buildings	$9,294,782
Vehicles	$546,850
Sign	$22,938
Recreation	$413,387
Parking Lots	$874,520
Equipment	$641,703
Total	**$49,681,856**

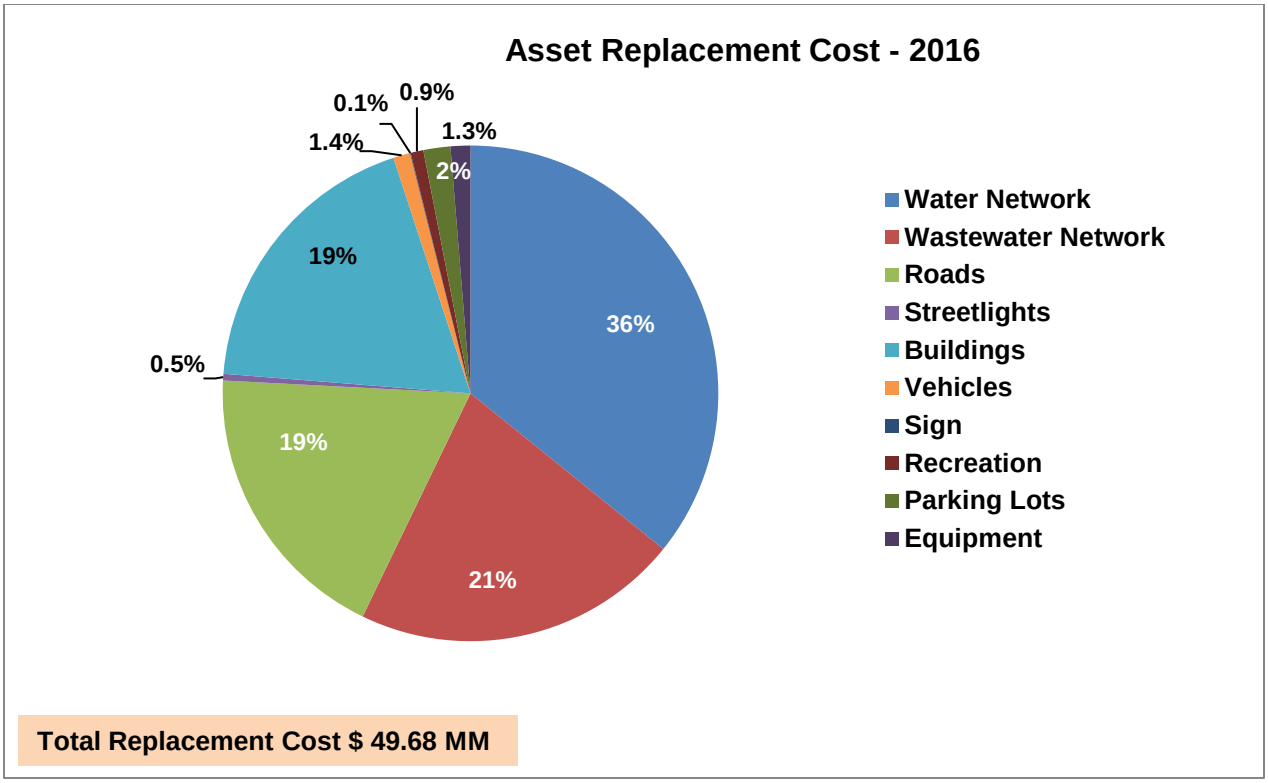


Figure 6: Assert Replacement Cost by Category

5.1 ROAD NETWORK

The Township of White River has a total of 15.56 km of roads in total in the form of gravel (G/S), and paved (HCB) roads.

5.1.1 ROAD GEOMETRICS

Road Surface Types
The following summarizes the road surface types within the Township:

Surface Type	Length (km)	Percentage
Gravel	8.16	52.44
Hot Mix Asphalt	7.40	47.56

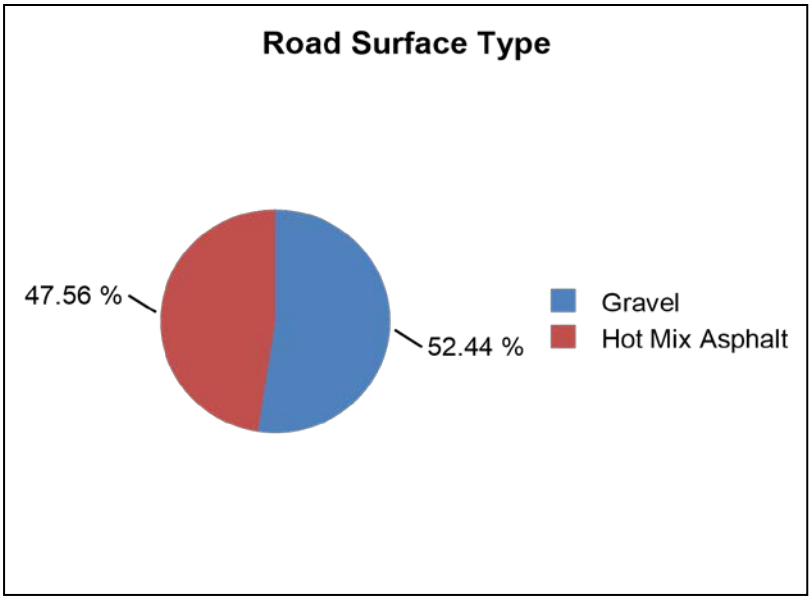


Figure 7: Road Surface Types by Section Length

Condition-Based Analysis for Roads

The state of the infrastructure for roads is determined through a hybrid age/condition based analysis. For the Township, PCI conditions were not available, so the PCI's were estimated based on treatment history and the use of degradation curves. No condition or maintenance data was available for the gravel roads, so only the paved roads are considered. The following summarizes the Network Pavement Condition Index (PCI) weighted by section length:

Surface Type	PCI
Hot Mix Asphalt	34.1

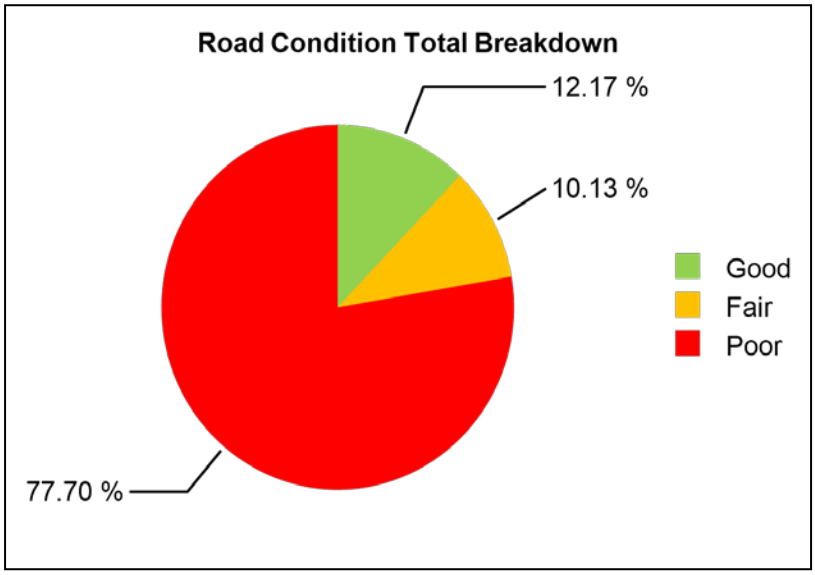


Figure 8: Paved Road Condition

Note: Percentages are calculated based upon the section length of each road type

The strategies for rehabilitation/reconstruction for roads are suggested in Appendix A, the detailed capital planning report for the Township.

5.1.2 OPTIMIZED CAPITAL PLANNING RESULTS

This section provides an overall summary of the optimized capital planning results for the paved road network of the Township of White River. The analysis is only focused on the paved road network with a total length of 7.4 km (excluding gravel roads). In terms of functional class, 100% of the network is local. In terms of roadside environment, 100% of the network is in an urban environment. In terms of surface type, 100% of the paved network is HCB (high class bituminous). The road network optimization analysis covers the period from 2017 - 2026, but due to the variance with the plan period only the amounts up to 2025 are considered for the CIP in this Asset Management Plan.

Budget Policy Scenarios
Optimization analysis is conducted to suggest an adequate level of spending to properly preserve the road network. Accordingly, several scenarios were analyzed. Scenario 1 is the recommended budget level. A target analysis was performed to establish the funding level required to bring the performance of the paved roads to borderline fair condition with a PCI of 50 over the next 10 years. To show the impact of different budget levels on the performance, we included Scenario 2 with a lower annual budget, and Scenario 3 with a higher budget level.

The following budget scenarios have been used in the optimization analysis:

Road Budget Scenarios

Year	Scenario 1	Scenario 2	Scenario 3
2017	$250,000	$125,000	$375,000
2018	$250,000	$125,000	$375,000
2019	$250,000	$125,000	$375,000
2020	$250,000	$125,000	$375,000
2021	$250,000	$125,000	$375,000
2022	$250,000	$125,000	$375,000
2023	$250,000	$125,000	$375,000
2024	$250,000	$125,000	$375,000
2025	$250,000	$125,000	$375,000

The optimization objective is to maximize the network overall performance considering municipal budget limits. The 'Network Overall Performance' represents the network performance considering network pavement condition index (PCI) in addition to all the other macro and micro policy factors, such as functional classes, surface types, roadside environments, traffic, service types, and socio-economic considerations, as set by the municipality. The network overall performance has a numerical value between 0 and 100, with 100 representing the best possible performance and 0 representing the worst possible performance. The results also report the 'Network Physical Performance' based on a weighted average PCI by sections' length. The network physical performance, if applicable, is further divided into different functional classes to better investigate the impact of budget policies on different classes of roads considering their relative importance.

Available Treatments and their Associated Costs

ISI's comprehensive list of pavement maintenance/rehabilitation/reconstruction treatments, cost database, and decision tree have been used in the analysis to determine feasible treatments and their associated cost in the optimization analysis. To predict future pavement condition, a series of degradation curves, developed by ISI in collaboration with Golder Associates, has been used for different classes of roads considering surface type, subgrade strength, functional classes, and traffic data. The detailed list of applied treatments and their associated cost can be found in Appendix A.

Network Optimization Results

Optimization analysis has been performed to produce a workable capital plan considering municipal budgetary constraints, while maximizing network overall performance to achieve the highest possible investment efficiency. The recommended capital expenditure (CapEx) over the capital plan under each budget scenario is shown in the table below.

Capital Expenditure (CapEx) for Budget Scenarios

	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	$240,337	$263,883	$259,721	$239,650	$261,362	$239,119	$261,806	$262,548	$263,296
2	$122,494	$118,623	$124,034	$124,829	$115,073	$124,309	$120,589	$124,805	$121,931
3	$372,464	$372,398	$374,598	$373,972	$369,835	$372,454	$356,039	$360,675	$373,878

Figure 9 shows a comparison between different budget scenarios in terms of network overall performance. In comparison with ranking or prioritization solutions, depending on the utilized ranking method, the optimization shows 15% to 30% added performance on average. The current overall performance of the network has been determined at 34.1, with 78% of the sections performing in a poor, 10% in a fair and 12% in an excellent condition state. Using the recommended budgeting strategy Scenario 1, over the next 10 years the performance of the network is improved to a more acceptable level with a PCI of 50 overall, which is the fair condition theshold. For the lower budget Scenario 2, the current level of performance is maintained with a PCI of 37, while the higher budget Scenario 3 yields a PCI of 59 at the end of plan.

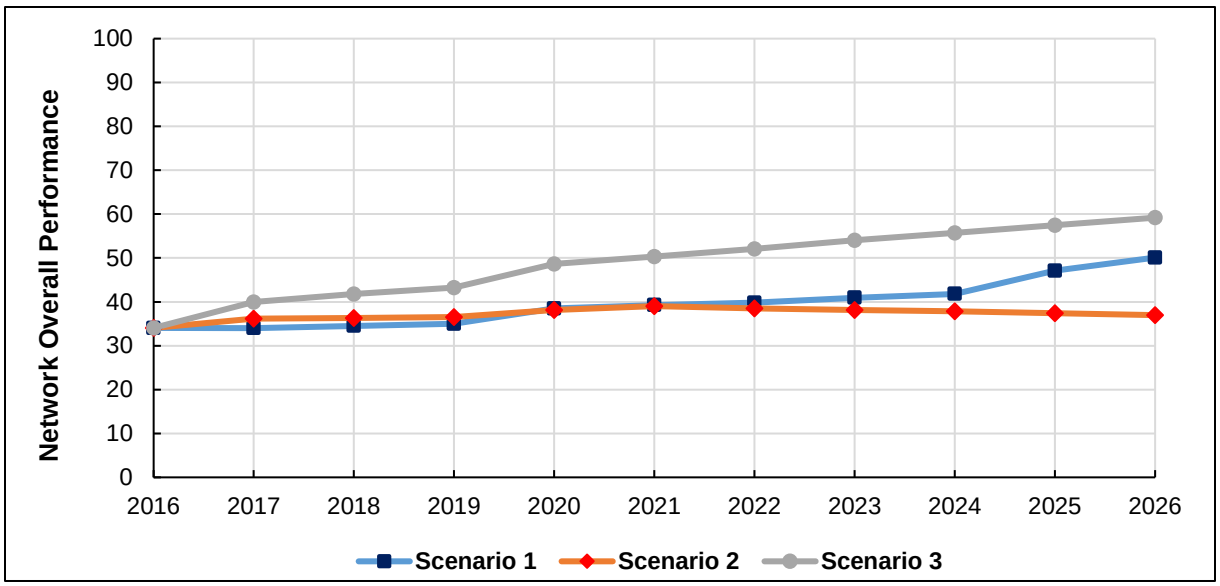
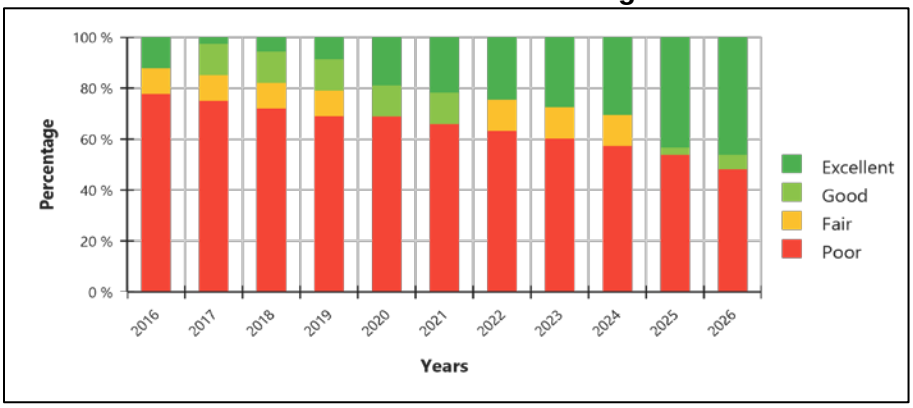


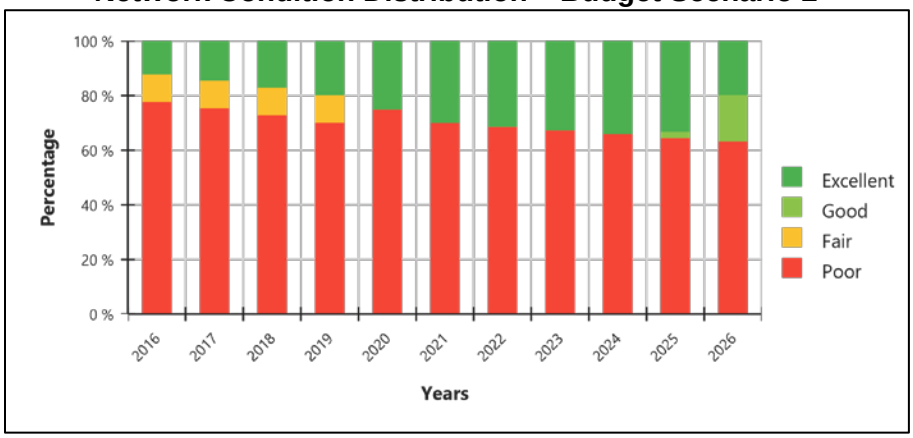
Figure 9: Scenario Comparison - Overall Network Performance

Figure 10 shows the condition status of the network at each year for each budget scenario. As shown in this figure, 77.7% of the network is in poor, 10.1% in fair, and 12.2% in good condition in the beginning of the plan. For Scenario 1 at the end of the plan 48.2% of the network will be in poor condition, 5.7% in good, and 46.1% of the paved roads will be in excellent condition. For the lower budget Scenario 2 after 10 years 63.2% will be in poor condition, while 17.1% will be in good and 19.8% in excellent condition. For the higher budget Scenario 3 at the end of plan only 34.9% of the paved roads will be in poor condition, 24.1% in good condition and 41.0% in excellent condition, a significant improvement.

Network Condition Distribution – Budget Scenario 1



Network Condition Distribution – Budget Scenario 2



Network Condition Distribution – Budget Scenario 3

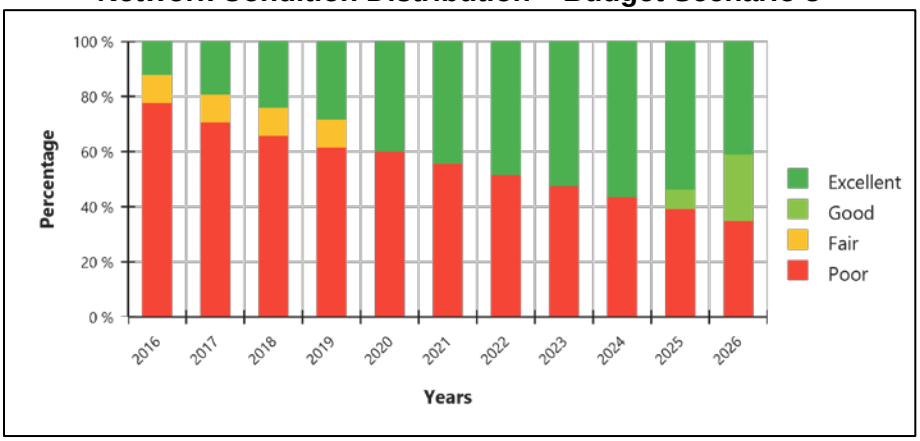


Figure 10: Scenario Comparison - Annual Network Condition Status

Paved road infrastructure deficit is estimated at $6,509,205 in the beginning of the plan. Figure 11 shows the deficit projections for each budget scenario. With the recommended budget Scenario 1 the projected deficit is estimated to be $4,234,384 at the end of the plan, showing a 35% reduction. With Scenario 2, the deficit is estimated at $5,553,921, a 15% reduction, while with Scenario 3 the end of plan deficit is estimated at $3,068,731, a 53% reduction.

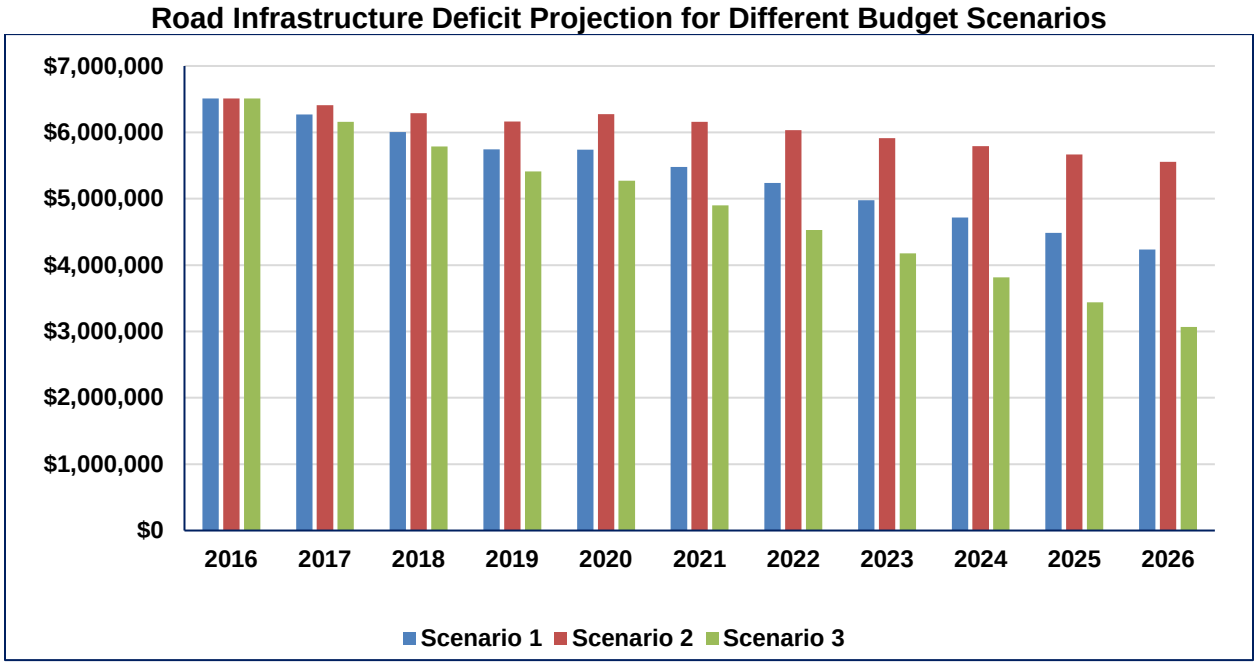


Figure 11: Road Infrastructure Deficit Projection

5.1.3 RECOMMENDED PROJECTS

The road replacement costs are based on contractor costs for the region that have been indexed based on our "Municipal Cost Index". ISI used numerous deterioration curves built into its road network capital planning and optimization software to make recommendations on White River's road network capital plan. These results are captured in Appendix A.

5.1.4 GRAVEL ROADS

The gravel road expenses are treated as operating expenses and are not included in the Capital Plan.

Lifecycle Activities – Loosetop (Unpaved)

We are only dealing with paved roads in this Capital Plan. Gravel road expenses are being captured as operating expenses, and inserting them into the Capital Plan would be a redundant entry. Our only concern is that the Township establishes whether it is allocating sufficient funds in its Operating Budget to cover the gravel road expenses. The OGRA strategy for gravel roads is to re-gravel roads 75 mm every 3 to 5 years depending on the AADT. Every Township we work with does annual maintenance rather than a 5-year resurfacing to 75 mm Granular A.

Timing	Activity	Activity Quantity Class of Road		
		4	5	6
Annual	Grading Dust suppression Ditching Culvert cleaning Safety devices	8 x per year 4t per kilometer 1 x per year as required	6 x per year 4t per kilometer 1 x per year as required	6 x per year 4t per kilometer 1 x per year as required
3 years	75mm Granular A	All roads	All roads	
5 years	75mm Granular A			All roads
6 years	75mm Granular A Spot repairs Drainage replacement	All roads 10% 12%	All roads 10% 12%	
10 years	75mm Granular A Spot repairs Drainage replacement			All roads 10% 12%

Figure 12: Gravel Road Maintenance Strategy (OGRA)

To Pave or Not To Pave Gravel

Paved roads provide improvement over gravel in ways that are hard to quantify with dollars, including improved winter surfaces, improved safety with better signage and delineation, a safer surface with higher skid resistance, a smoother surface that increases user satisfaction and reduces vehicle maintenance costs, redistribution of traffic away from gravel roads, and an increased tax base on adjacent property. Like everything else, maintenance costs for both paved and unpaved roads are rising. Reduced funding and resources require more efficient use of available money.

The decision on when to pave a gravel road is not easy, but an increase in traffic does lead to an increase in maintenance costs, especially for gravel roads. This is due to more lost gravel due to wear, and an increased need for blading and smoothing of the road surface.

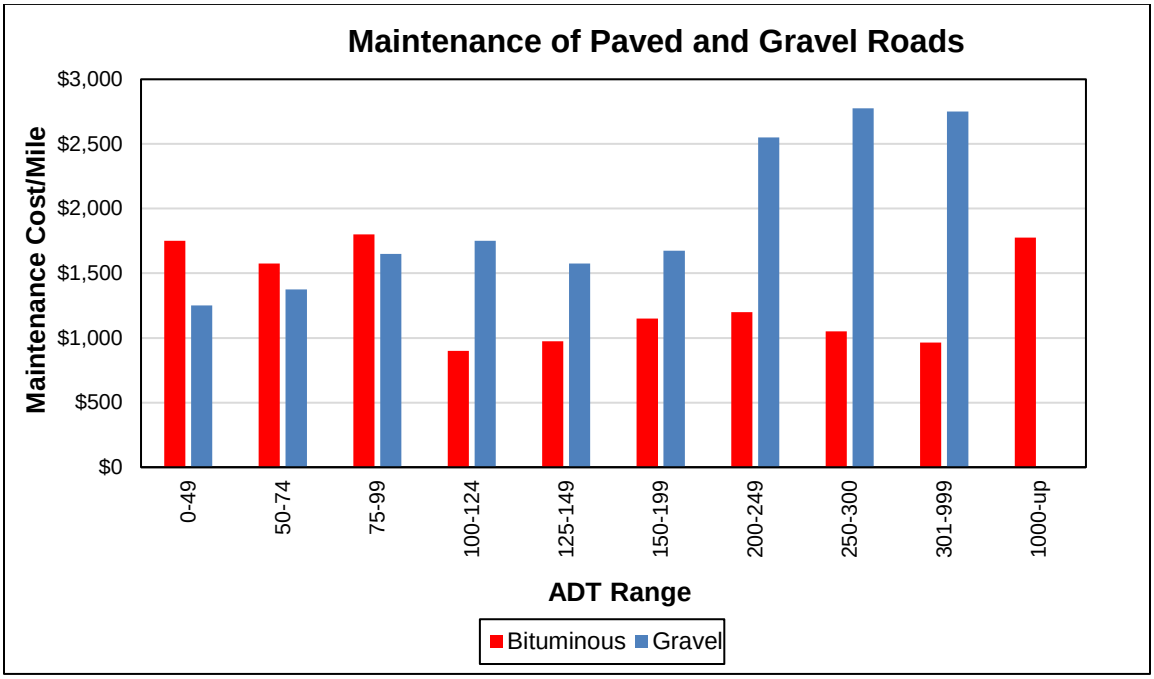


Figure 13: Economics of Upgrading an Aggregate Road

Source: The Minnesota Local Road Research Board, 2005

Traffic is a primary factor in deciding to pave or not to pave. Gravel road maintenance costs per mile appear to increase considerably after an ADT level of 200 vehicles/day. Paved roads are most cost-effective at ADT levels above 150 vehicles/day. Informed decisions can be made based on traffic data, local construction and maintenance costs, and area growth values to determine if and when a roadway should be paved.

5.2 WATER NETWORK

The raw water source for The Township is Lake Tukanee located approximately 3.8 kilometers northeast of the water treatment plant. The surface water supply for the Township flows through an intake structure located in approximately 5 metres of water depth, and about 25 metres from shore within Lake Tukanee. An intake pipe conveys raw water by gravity from the intake structure to the wet well.

The pumping station is equipped with submersible pumps that start and stop in response to pressure in the raw water transmission main. An automatic valve located in the Water Treatment Plant (WTP) opens, based on a signal from the Blueberry Hill Reservoir, which starts the flow of raw water through the treatment process. Two of three pumps are called to start and continue to run until the Reservoir is full and a signal closes the automatic valve.

Figure 14: Water Treatment Plant

There are three valves at the entrance to the WTP. An electric actuator valve starts and stops the flow of water through the treatment process. Once the flow rate is manually set, the SCADA system monitors and records the flow into the WTP on a continuous basis.

The surface water treatment system consists of ozonation, roughing filters, slow sand filters, and granular activated carbon. Each filter train consists of two (2) roughing filters, a slow sand filter and a GAC contactor. Ozone is added to the raw water to oxidize the organic materials in the raw water, which produces a particulate matter that needs to be filtered out, and reduces taste, odour, and colour.

The standby primary disinfection system is chlorination. Sodium hypochlorite is added to maintain a chlorine residual in the distribution system. Also, a UV irradiation for disinfection of the raw water supply is used. Other processes such as de-chlorination are used on the backwash water which is necessary prior to discharge into the exfiltration trench.

The reservoir provides a supply of clean potable water to the community for public consumption during peak water demand periods, and for emergency supply purposes. The reservoir is located on the south side of the community on Blueberry Hill. The reservoir is classified as a two-celled in-ground reservoir and has a maximum useable storage capacity of 1,350 m^3.

In the event of a power failure, a Diesel Electric Generator Set (Gen-Set) has been installed to provide a backup power supply. If the power does go out and there is a delay in starting the Gen-Set, battery operated emergency lights will come on in the building until power is restored. Under full load, the Gen-Set Uses 6.7 U.S. gallons of fuel per hour (25.5L/hr.).

The Township WTP contains two (2) high lift pumps which pump the water from the facility's clear well to the distribution system through to the reservoir, and are controlled by a Milltronics ultrasonic level control system located in the Blueberry Hill Reservoir.

The distribution system receives treated water from the Township Water Treatment Plan. The individual components of the water main system are described as follows:

- Main valves are located at regular intervals along the water main.
- Fire Hydrants are located throughout the community.
- Water Services are 19 mm to 50 mm diameter pipes that run from water mains to property lines.

An age-based analysis has been conducted on the water assets due to the non-availability of condition ratings. The calculations, undertaken in this circumstance, were to determine the remaining life of the asset on age-based analysis with pre-defined criteria. Age-based condition assessment has **the least level of confidence to determine the current State of Infrastructure.** The graphs below show the age-based analysis (life used for each asset depending on their total useful life) for each asset mentioned above.

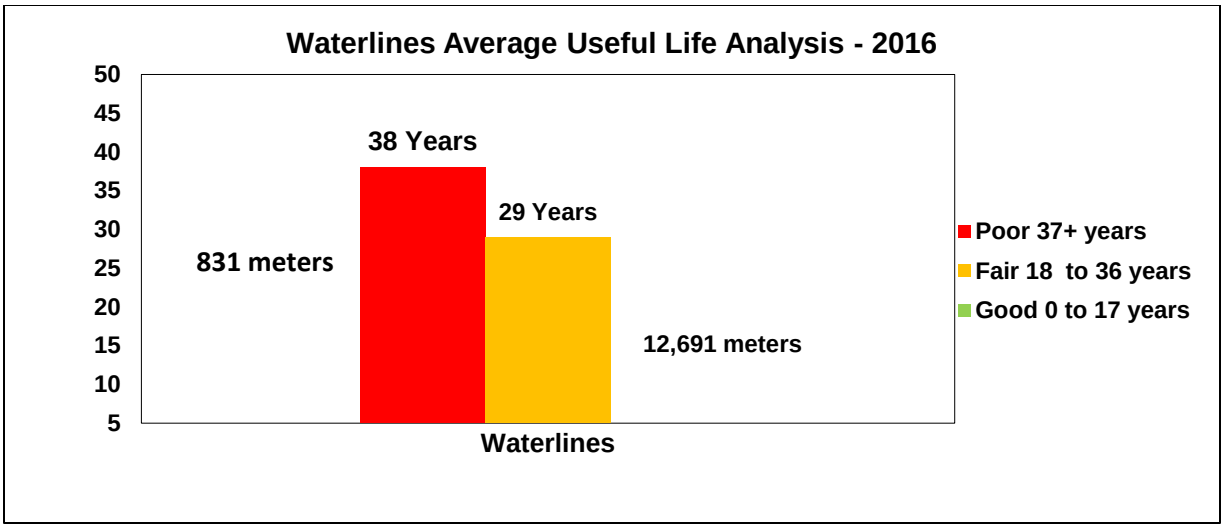


Figure 15: Waterlines Average Useful Life

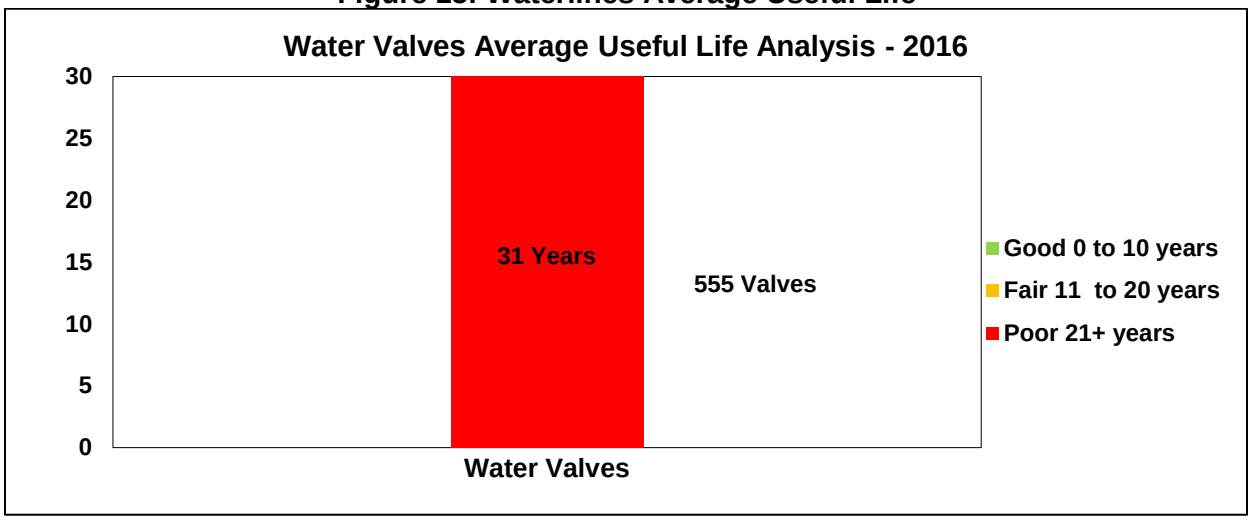


Figure 16: Water Valves Average Useful Life

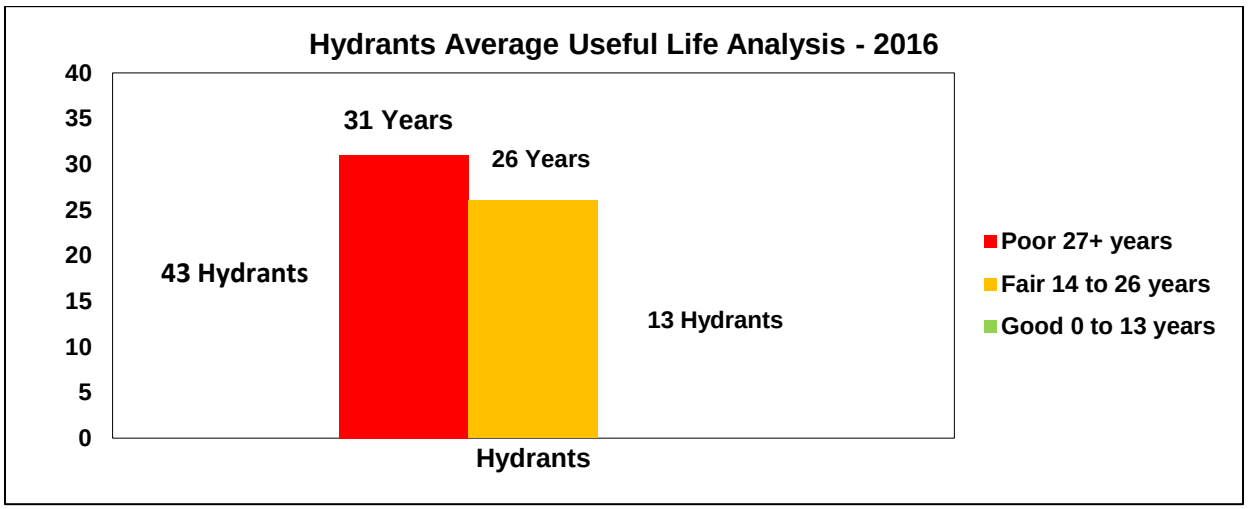


Figure 17: Hydrants Average Useful Life

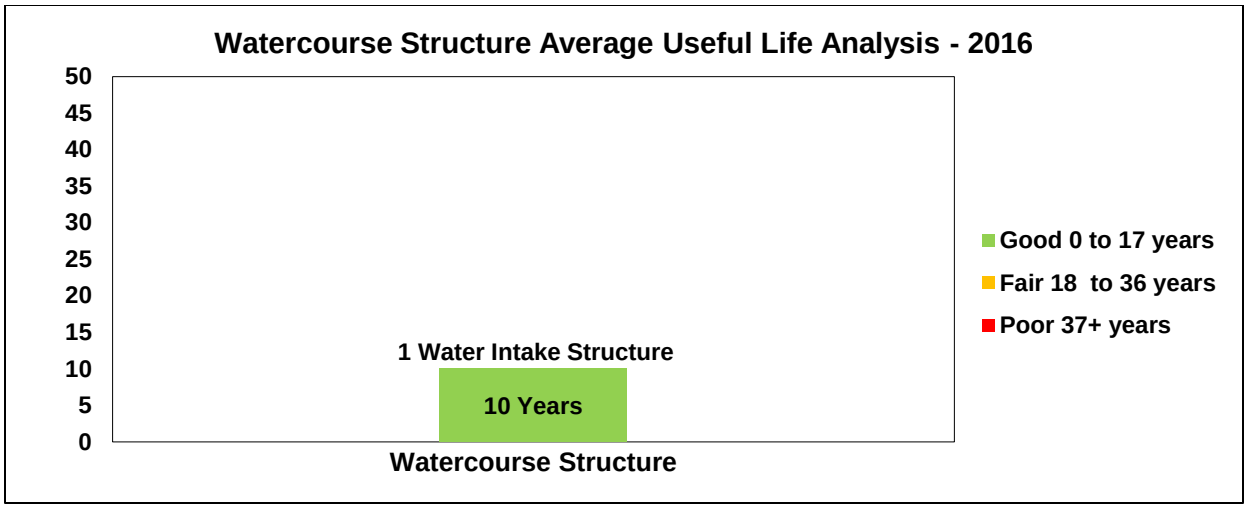


Figure 18: Watercourse Structure Average Useful Life

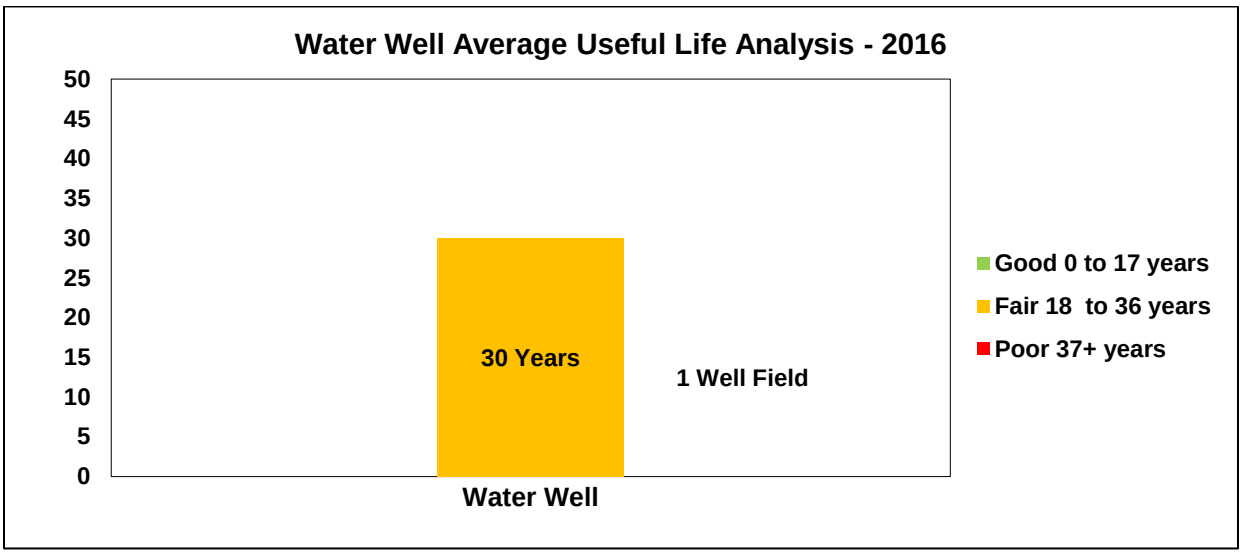


Figure 19: Water Well Average Useful Life

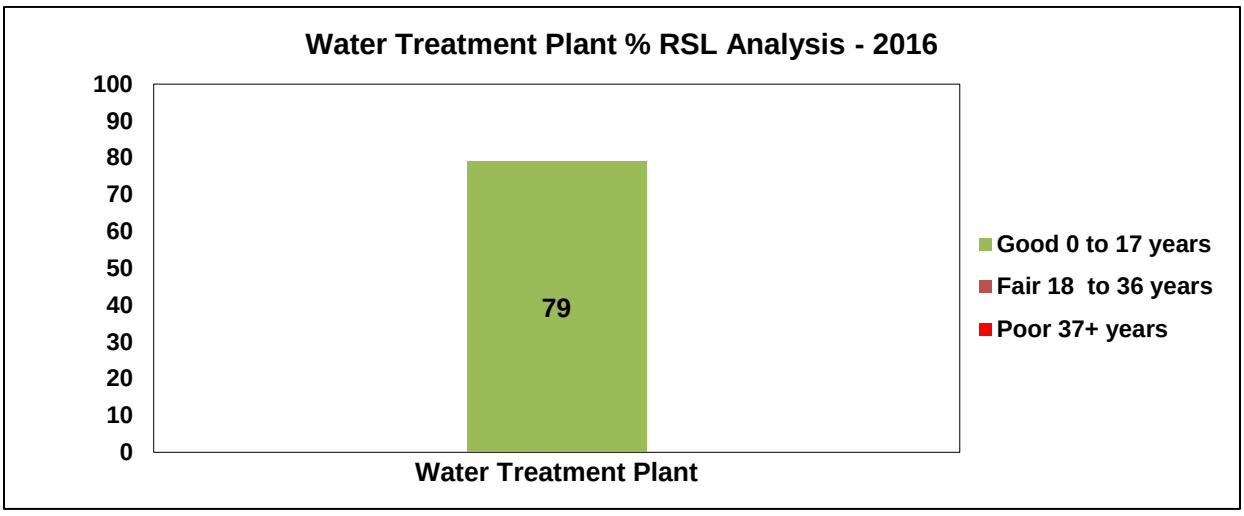


Figure 20: Water Treatment Plant % Remaining Service Life

A remaining service life analysis is used for the Water Treatment Plant because it is comprised of various components with different useful life criteria.

5.3 SEWER NETWORK

The Township Sewage Works consists of five pumping stations, a waste stabilization pond with influent and effluent works, and interconnecting structures. The waste water generated within the collection area of White River is collected into the sewer system and pumped to the 180 day retention stabilization pond by way of a 250 mm diameter force main. The waste stabilization pond is constructed in two cells totaling 12 acres, with a design capacity of 86,950 cubic meters. The cells have been designed to operate in series or in parallel, with an effluent discharge through two 250 mm diameter outflow sewers into Chain Lakes Creek, which in turn discharges to the White River upstream of the community.

There are four pumping stations in the wastewater collection system. Two of the pumping stations, Stanworth and Durham, collect and pump sewage to the waste stabilization pond. The Stanworth pumping station collects the wastewater from the Stanworth subdivision and the arena. It consists of two A.B.S. submersible pumps and a 40 kW backup generator. This station pumps directly to the lagoons via a 150 mm diameter force main. The overflow for this station leads to the field out back. The Spadoni pumping station collects wastewater from Spadoni and Allaire streets. It has two 2.2 hp submersible Flygt pumps and no backup generator. Its overflow leads to a gravity sewer cover. This station pumps to the Dufferin St. pumping station via gravity. The Dufferin pumping station collects wastewater from Hwy. 17, Ontario St. West and the Spadoni pumping station. It consists of two 5 hp Flygt submersible pumps and a 25 kW backup generator. Its overflow leads to a gravity manhole, and its wastewater flows to the Durham St. pumping station.

An age-based analysis has been conducted on the sewer assets due to the non-availability of condition ratings. The calculations, undertaken in this circumstance, were to determine the remaining life of the asset on age-based analysis with pre-defined criteria. Age-based condition assessment has **the least level of confidence to determine the current State of Infrastructure.** The graphs below show the age-based analysis (life used for each asset depending on their total useful life) for each asset mentioned above.

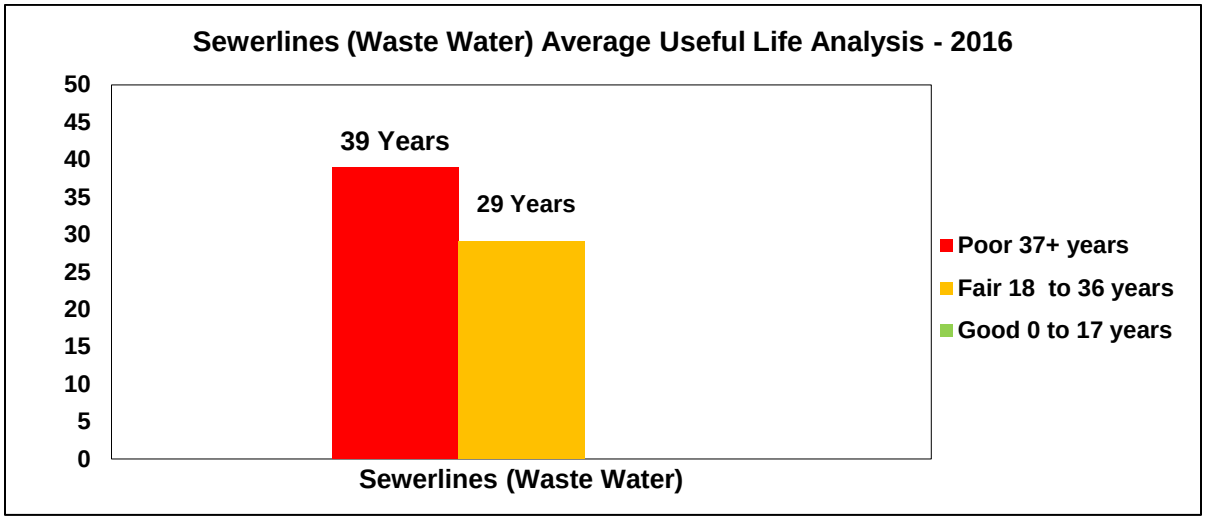


Figure 21: Sewerline (Wastewater) Average Useful Life

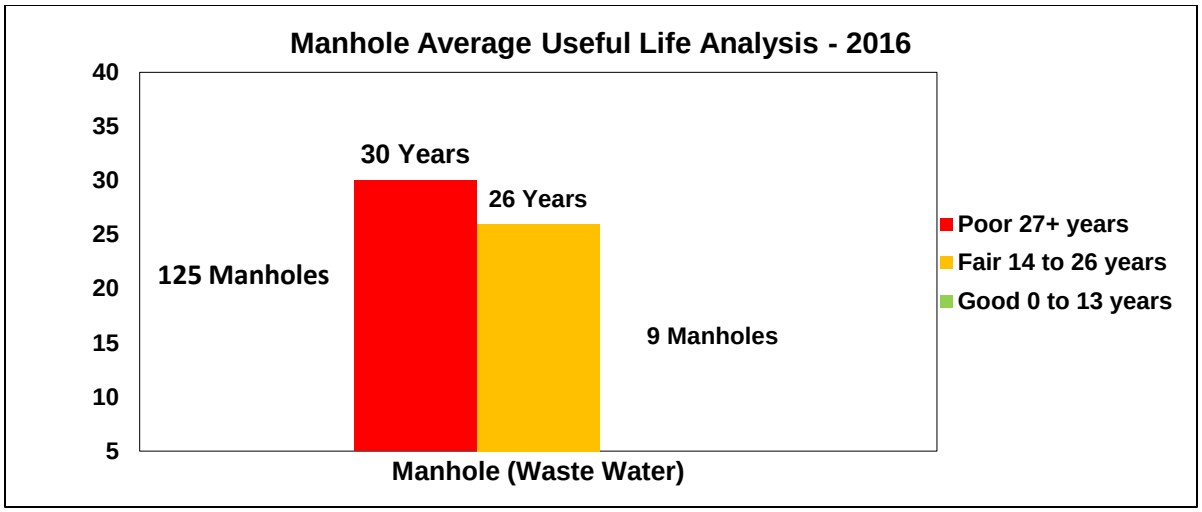


Figure 22: Manholes Average Useful Life

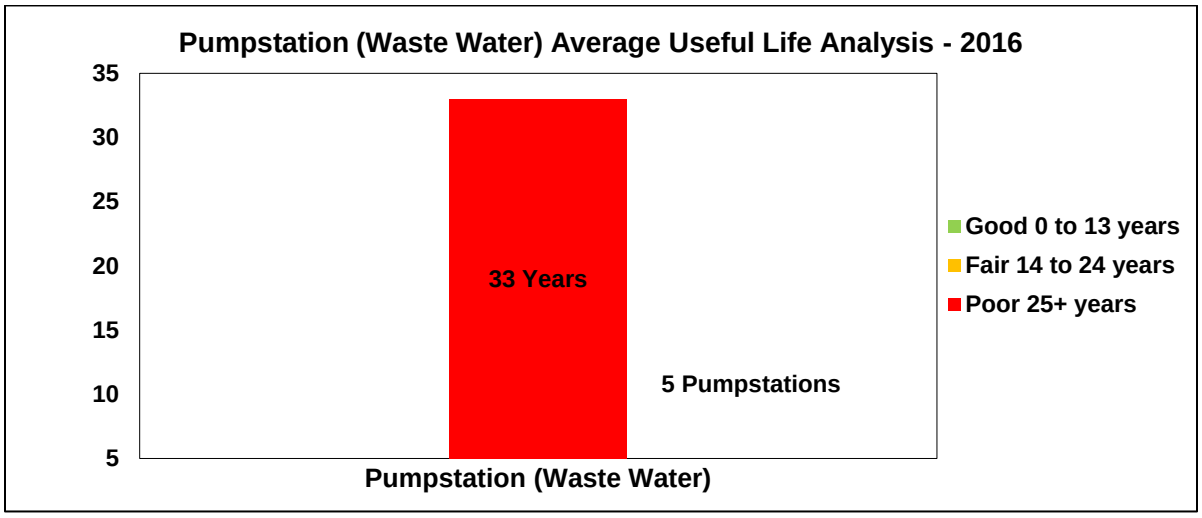


Figure 23: Wastewater Pump Station Average Useful Life

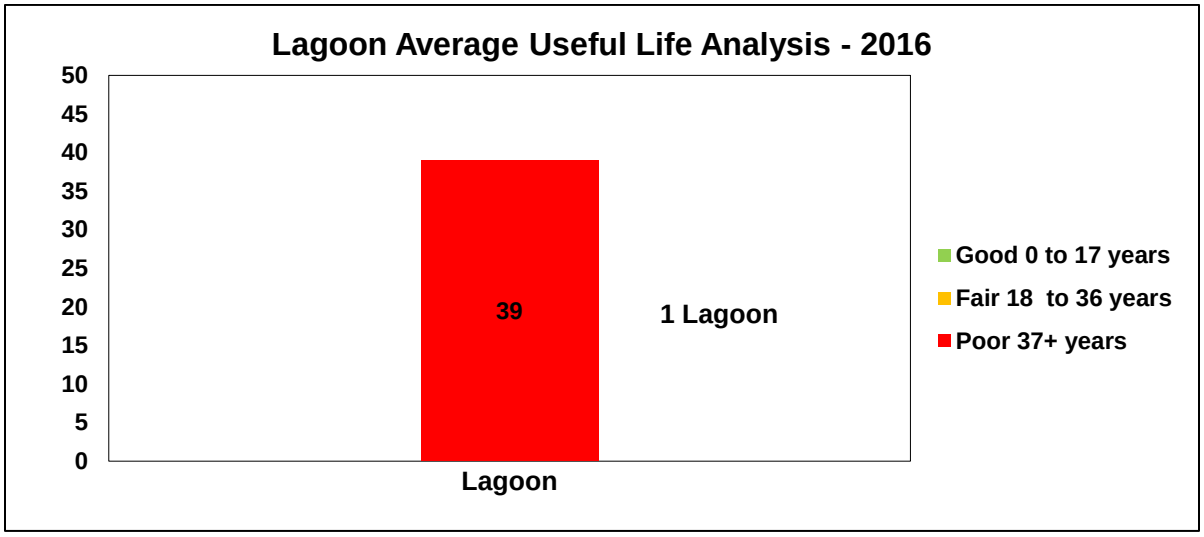


Figure 24: Lagoon Average Useful Life

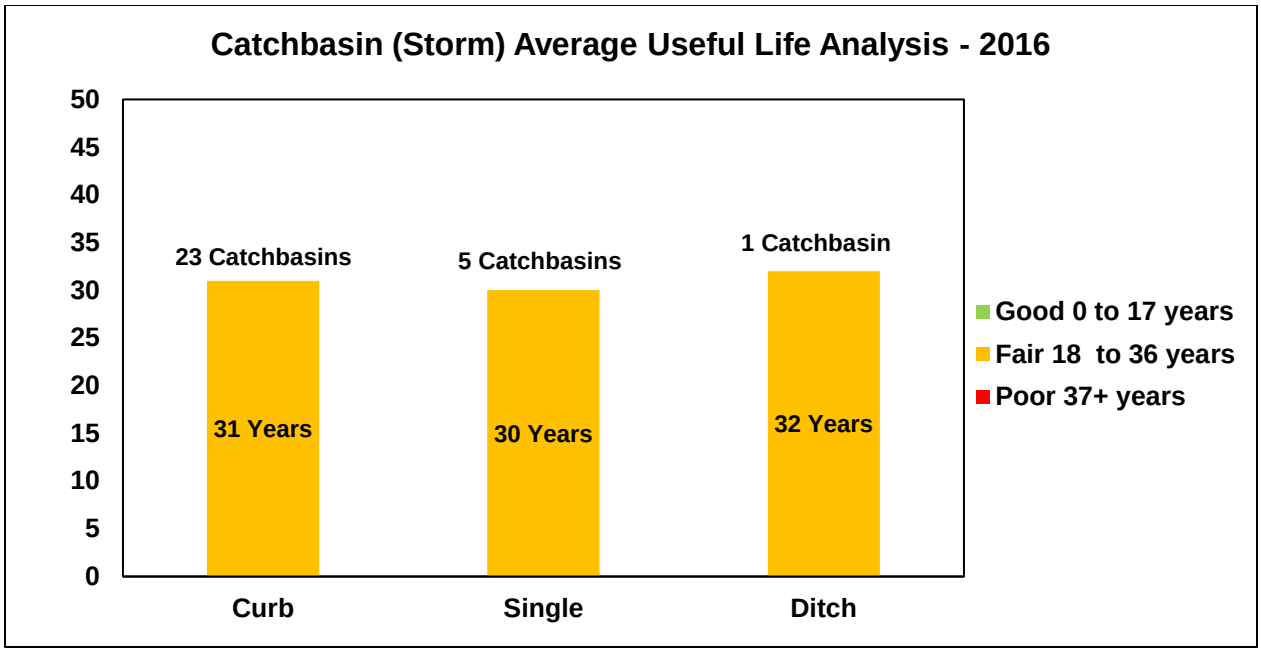


Figure 25: Catchbasin (Storm) Average Useful Life

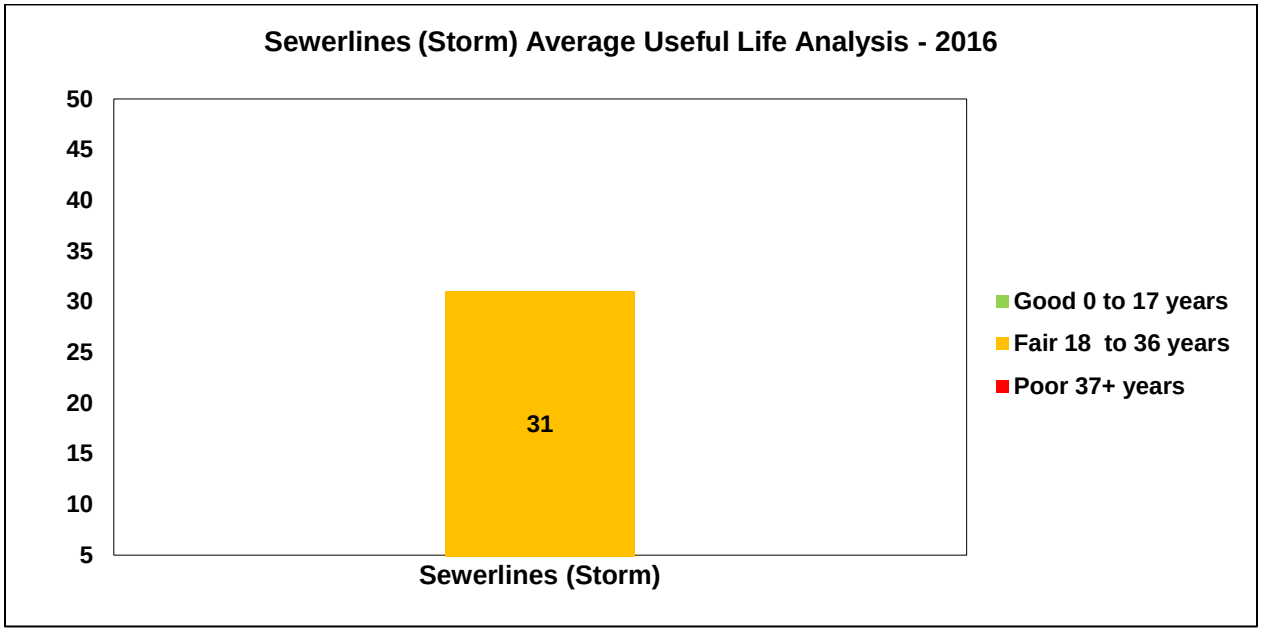


Figure 26: Sewerlines (Storm) Average Useful Life

5.4 SOTI CONCLUSION

Asset Group	Overall Condition Rating	Rating		Range (Conditions)	Comments
Road Network	C	A	Good	70 to 100	Condition rating based on a hybrid condition/age-based analysis
		B	Fair	50 to 69	
		C	Poor	0 to 49	
				Range (in Years)	
Water Network	B	A	Good	Different ranges based upon total useful life for each asset type	Condition rating based on age-based analysis
		B	Fair		
		C	Poor		
Sewer Network	B	A	Good	Different ranges based upon total useful life for each asset type	Condition rating based on age-based analysis
		B	Fair		
		C	Poor		

Figure 27: Linear Asset Condition Rating Report Card

As highlighted in the Report Card above, the current state of the linear infrastructure, based on available condition rating analysis, presents a picture of the Township's linear assets. The condition analysis according to the asset type is as follows:

- Paved (HCB) are in poor condition
- Water and Sewer Networks are in fair condition

The Township should continue to be proactive in their strategies, so as to extend asset useful life and avoid major rehabilitation/reconstruction or replacement costs.

6 NON-LINEAR ASSET TYPES

The various non-linear assets are analyzed on an age basis using the Township's Useful Life criteria as outlined in the TCA policy. Age based analysis does not take into account how well an asset has been maintained unless there was major capital expenditure on the asset. Therefore age-based analysis has **the least level of confidence to determine the current State of Infrastructure.**

6.1 STREET LIGHTS

This group comprises Hydro Poles and Street Lights. The Street Lights were upgraded in 2015.

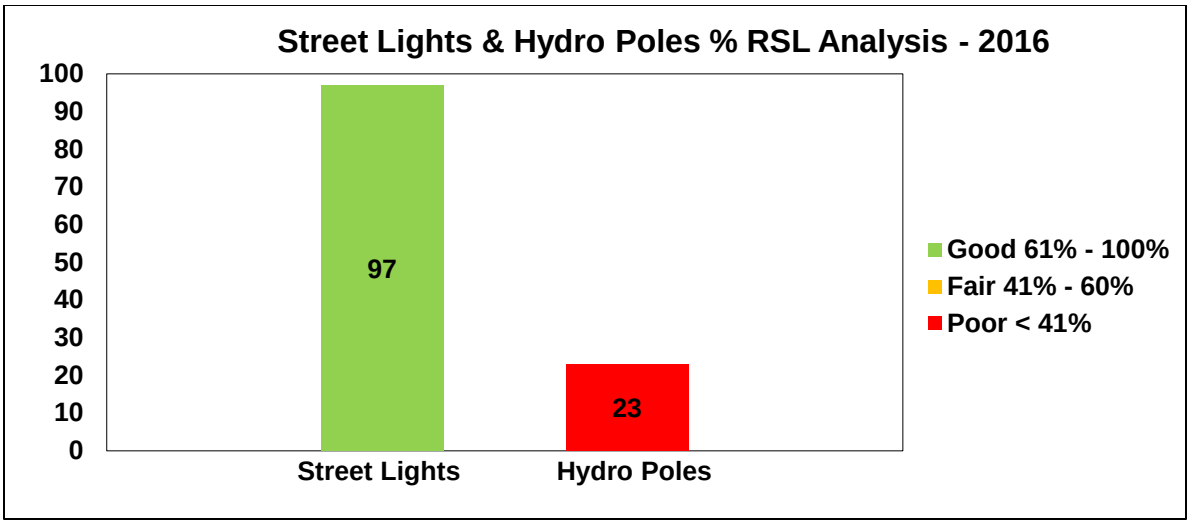


Figure 28: Street Lights - Remaining Service Life Analysis

6.2 BUILDINGS

This group comprises of buildings like the municipal office, fire department building, medical centre, etc. The replacement cost of the buildings is taken from the insurance document (2013) provided by the Township, is inflated to 2016 and HST of 1.76% is added to the base costs. For the Township's buildings, ISI conducted age-based analysis to determined condition assessments to maintain the current portfolio. For buildings that received major renovations we adjusted the age to reflect that. Building replacement projects were not included in the Capital Plan as this would be unrealistic. Since we had no information on the condition of the various building components or about planned renovations, no building projects are placed in Appendix A.

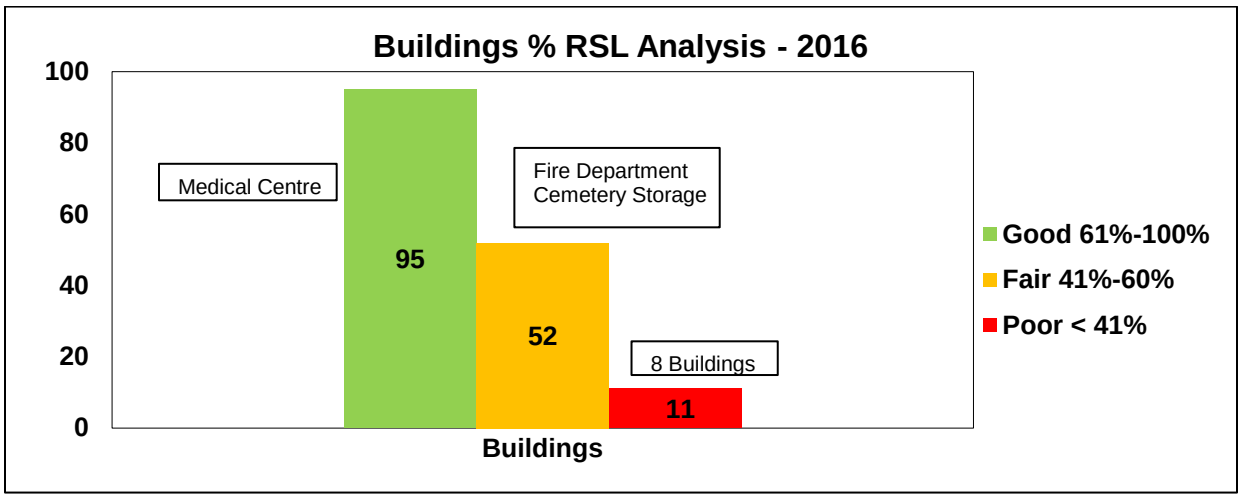


Figure 29: Buildings - Remaining Service Life Analysis

6.3 VEHICLES

The vehicle group comprises of pump trucks, a dump truck, a hospital van, pickup trucks, etc. The replacement cost is calculated using the Township's PSAB report for 2015, and in the case of the costs not provided, the historical costs have been indexed using the CPI and Municipal

Cost Index and added 1.76% HST to the costs. Further review and discussion with the Township are required to ascertain the accuracy of the Township's vehicle requirements.

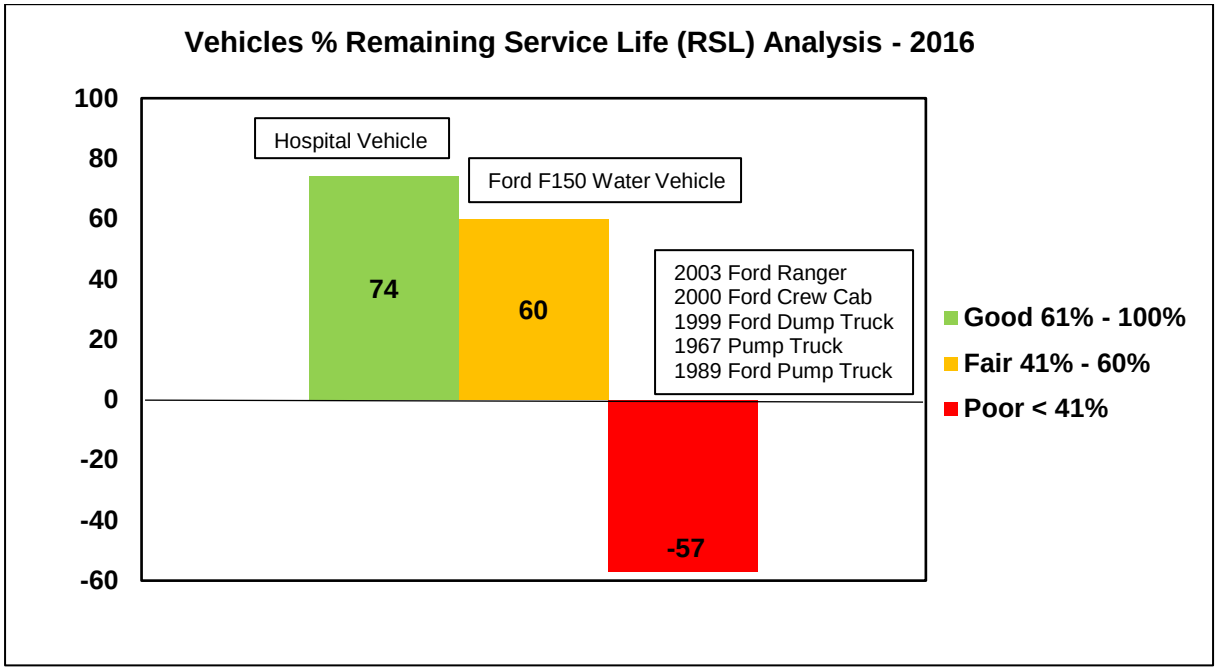


Figure 30: Vehicles – Remaining Service Life Analysis

Please note: *A negative % Remaining Service Life of -57% means that the Useful Life of these vehicles has been exceeded by 57% on average.*

6.4 WELCOME SIGN

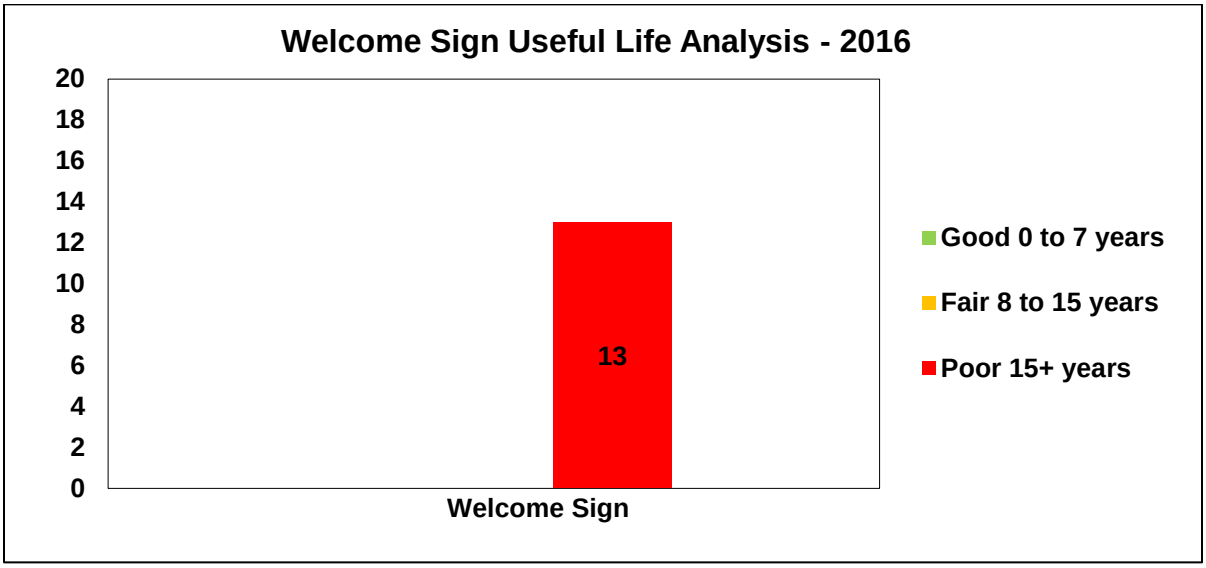


Figure 31: Welcome Sign – Useful Life Analysis

6.5 RECREATION

This group contains an Baseball Field and Winnie the Pooh Park. In the Tangible Capital Assets (TCA) document, the Field and Park were given a useful life of 10 years. As a result, our system triggers expenditures which may or may not be necessary. In this report, we have included system triggered potential expenses which will need to be reviewed for validity by White River.

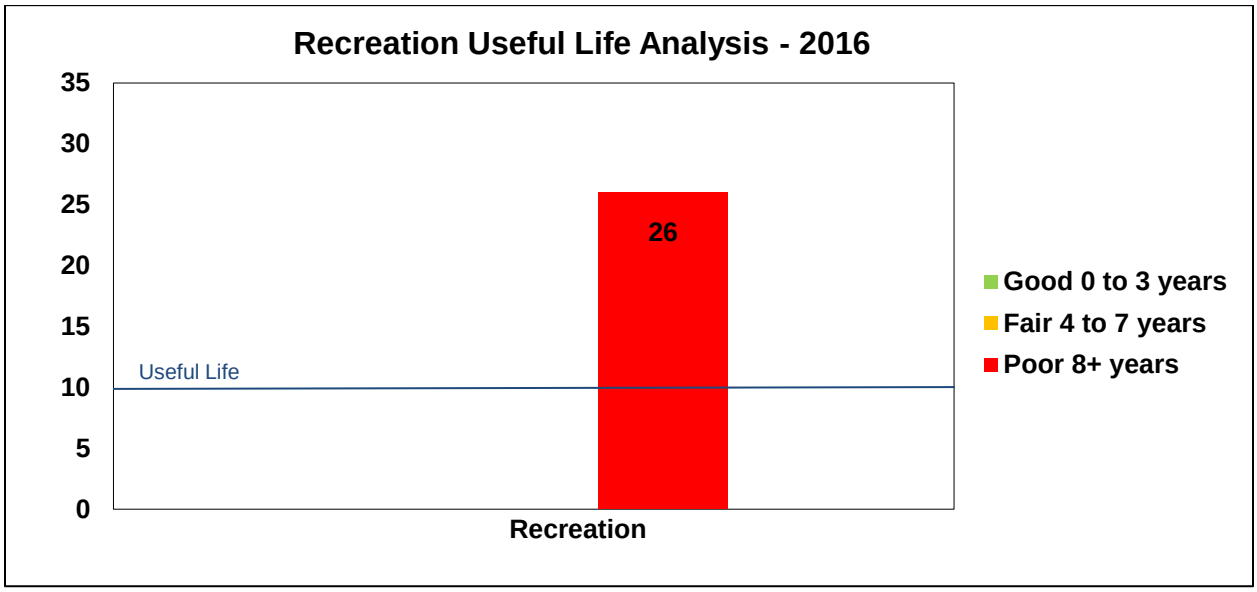


Figure 32: Recreation – Useful Life Analysis

6.6 PARKING LOTS

The Township maintains 10 parking lots.

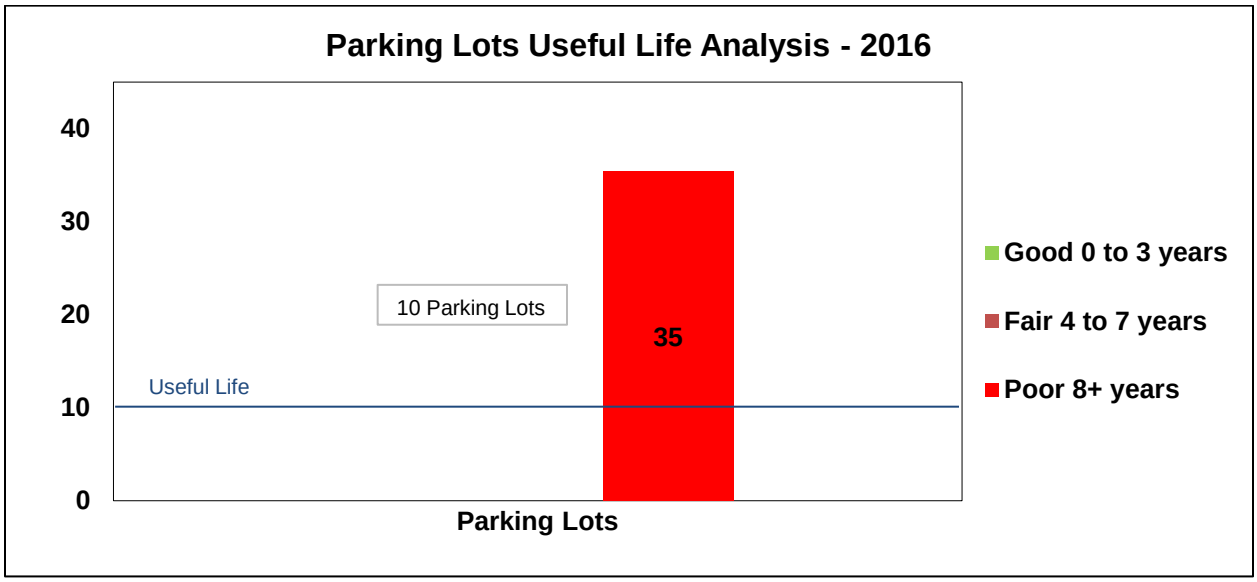


Figure 33: Parking Lots – Useful Life Analysis

6.7 EQUIPMENT

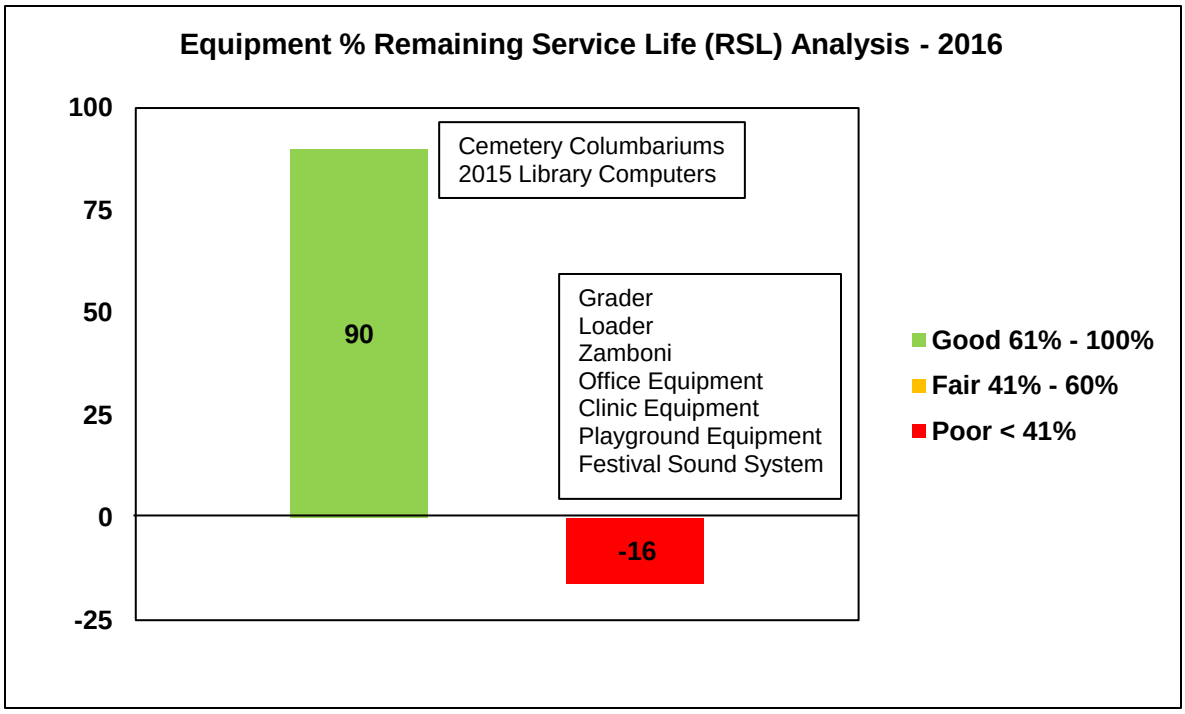


Figure 34: Equipment – Remaining Service Life Analysis

Please note: *A negative % Remaining Service Life of -16% means that the Useful Life of this equipment has been exceeded by 16% on average.*

7 CAPITAL PLAN

7.1 BACKGROUND

Managing the Township's capital assets requires an assessment of the long-term capital project requirements and the establishment of the funding for high-priority projects in an efficient, timely and cost-effective manner. As a result of this analysis, the Township will be able to more effectively monitor, track and manage infrastructure assets, to ensure that policy makers obtain sufficient funding in order to maintain, at a minimum, and potentially enhance future service levels. Through capital planning, the Township of White River can plan the future operating budget expenses and reserve funds to manage the financial position over a long-term period. Capital planning also provides the core information needed for implementing the Council's planning and fiscal policies.

An Asset Management Plan provides many benefits including:

- A systematic evaluation of all potential projects at the same time.
- The ability to stabilize the debt and consolidate projects to reduce borrowing costs.
- To serve as a public relations and economic development tool.

- A focus on preserving a municipal government's infrastructure while ensuring the efficient use of public funds.
- An opportunity to foster cooperation among departments and the general public regarding the Township's priorities.

7.2 OVERVIEW

The Capital Plan, an integral part of an Asset Management Plan, is a blueprint for planning a community's capital expenditures and is one of the most important responsibilities of local government officials. It coordinates community planning, financial capacity, and physical development. It is a tool to assess the long-term capital project requirements of a Township and to establish funding of high-priority projects in a timely and cost-effective fashion. The development of a Capital Plan is intended to ensure that policy makers are responsible to residents and businesses of the community with respect to the expenditure of public funds. It also promotes the provision of continuous efficient services.

The Capital Plan provides a detailed understanding of anticipated investments into tangible capital assets. These assets include basic facilities, services, and installations needed for the functioning of the community. The development of a CIP that will ensure sound fiscal and capital planning requires effective leadership and the involvement and cooperation of all municipal departments. A complete, properly developed CIP has the following benefits:

- Facilitates coordination between capital needs and the operating budgets
- Enhances the community's credit rating, control of its tax rate, and avoids sudden changes in its debt service requirements
- Identifies the most economical means of financing capital projects
- Increases opportunities for obtaining federal and provincial aid
- Relates public facilities to other public and private development and redevelopment policies and plans
- Focuses attention on community objectives and fiscal capacity
- Keeps the public informed about future needs and projects
- Encourages careful project planning and design to avoid costly mistakes and help a community reach desired goals

A municipal government must take care of two key responsibilities in managing its infrastructure:

- The first major responsibility is the maintenance and repair of existing infrastructure. Given the high cost to replace linear assets and the fact that they are essential to providing programs and services to the public, it is extremely important that regular maintenance and periodic refurbishments be done to keep facilities and other assets in good working condition for as long as possible.
- The second major responsibility that municipal governments have is to plan and construct new community infrastructure. This involves several steps including deciding what services are to be provided, identifying community needs, careful planning, determining priority investments, figuring out how to finance projects and good management to ensure projects are completed on time and on budget.

Although the Capital Plan is generally maintained separately from the operating budget, they do work in unison since the debt charges on funds borrowed for capital expenditures become expense items in the annual operating budget. In addition, operating and maintenance costs of capital assets have an impact on the operating budget. In order to have a realistic, workable Capital Plan,

therefore, it is necessary to estimate the effect that debt service and operating costs will have on future tax rates. In this way, non-essential capital expenditures will not be undertaken at the expense of pending essential capital projects and the Township will thus be in a better position to control future debt levels.

7.3 METHODOLOGY

The Township of White River's Capital Plan addresses infrastructure deficiencies and future capital expenditures. It includes existing service infrastructure not meeting engineering standards, the cost of renovation or replacement of infrastructure which has exceeded its service life and which as a consequence, is not meeting required service standards. Provision is required to renovate or replace previously constructed infrastructure when it reaches the end of its service life. These costs do not include on-going operational and regular maintenance (which typically represent the greatest cost component of a facility's service life, for example). Unless informed by the Township, requirements such as investments required to support industrial, commercial and residential development in accordance with the growth projections required to serve the community and social needs as well as supply the increasing population and to service to the boundaries of new subdivisions have not been analyzed.

The Township's Capital Plan includes:

- Development of parameters for each asset class
- Development of rehabilitation and replacement unit costs
- Identifying the asset types to be included in the Capital Plan and determining and confirming the components of each asset class
- Identification of services to be provided and the capital expenditures to be incurred
- Determination of secondary cost estimates of capital expenditures (consideration of cost elements such as remoteness of the Township, land, architect/engineering fees, construction, legal fees, taxes, etc.). The non-rebatable portion of HST at 1.76% has been applied, for example
- Determination of the time periods over which the asset is to be constructed or acquired and the costs prorated accordingly

The methodology used for building this Capital Plan was to:

1) Determine the "unconstrained" rate of capital expenditure (assuming an unlimited budget). A constrained rate of capital expenditure is provided in the final report.
2) Identify the Township's current infrastructure deficit.
3) Determine the Township's future requirements
4) Prepare a report detailing the capital required for each asset class based on current rehabilitation and replacement unit costs
5) Establish the cost of maintaining existing infrastructure while addressing the infrastructure deficit.

8 ASSET MANAGEMENT PLAN RESULTS

Like most other local governments in this province, White River is struggling with aging infrastructure and constrained budgets. Upon completion of the collection of all the pertinent data, the capital plan was generated, broken down by asset class for the years 2016 to 2025

(with HST and without inflationary factor), was developed. Inflation will be incorporated in the financial analysis. The results are as follows:

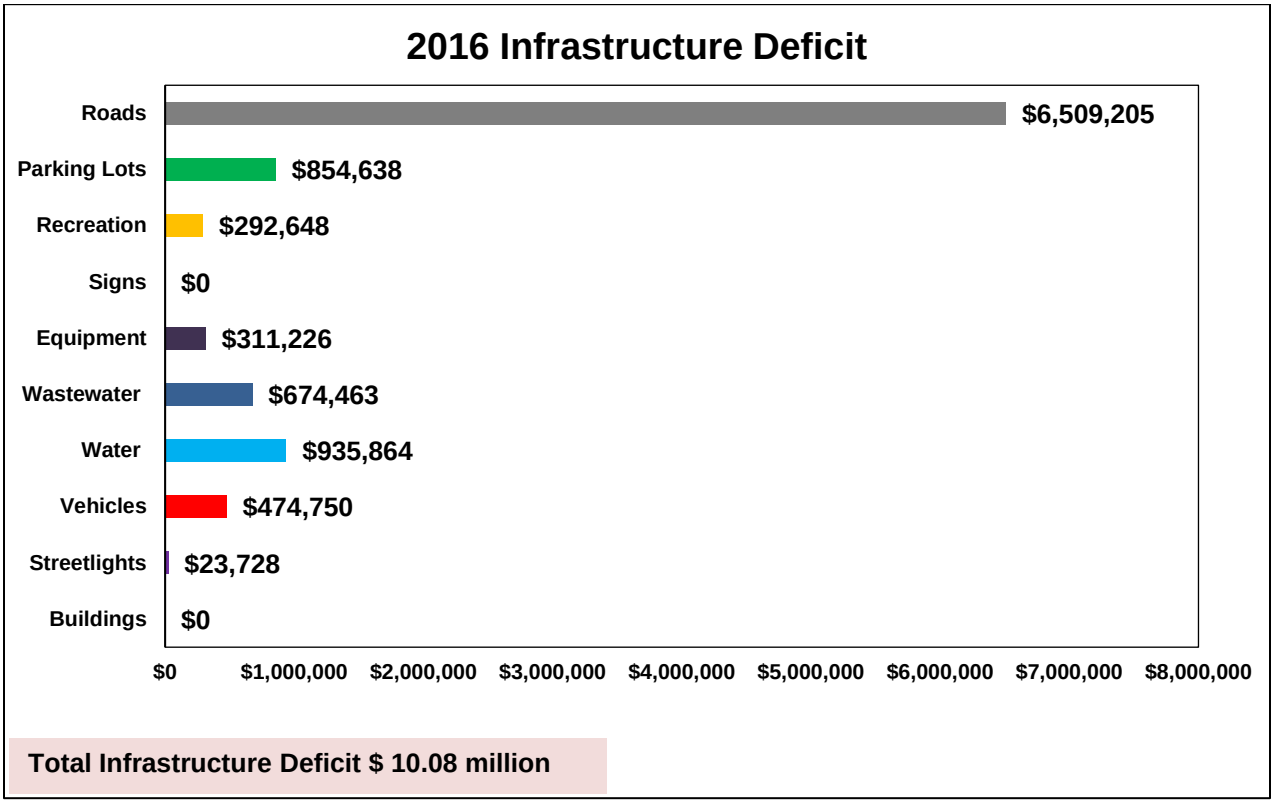


Figure 34: 2016 Infrastructure Deficit by Asset Category

Timeframe	Year	Capital Projects (Incl. HST)
Year 2016-2025	2016	$0
	2017	$341,272
	2018	$659,596
	2019	$454,076
	2020	$1,131,062
	2021	$369,901
	2022	$318,738
	2023	$598,614
	2024	$470,548
	2025	$817,966
Total		**$5,161,772**

Timeframe	Year	Buildings	Streetlights	Vehicles	Water	Wastewater	Equipment	Roads
Year 2016-2025	2016	$0	$0	$0	$0	$0	$0	$0
	2017	$0	$0	$0	$0	$100,935	$0	$240,337
	2018	$0	$0	$0	$333,853	$0	$41,978	$263,883
	2019	$0	$0	$0	$0	$134,856	$0	$259,721
	2020	$0	$0	$0	$370,896	$252,954	$267,561	$239,650
	2021	$0	$0	$0	$59,334	$0	$43,096	$261,362
	2022	$0	$0	$36,125	$43,494	$0	$0	$239,119
	2023	$0	$0	$0	$0	$264,708	$49,162	$261,806
	2024	$0	$0	$0	$208,000	$0	$0	$262,548
	2025	$0	$0	$0	$354,668	$195,141	$4,861	$263,296

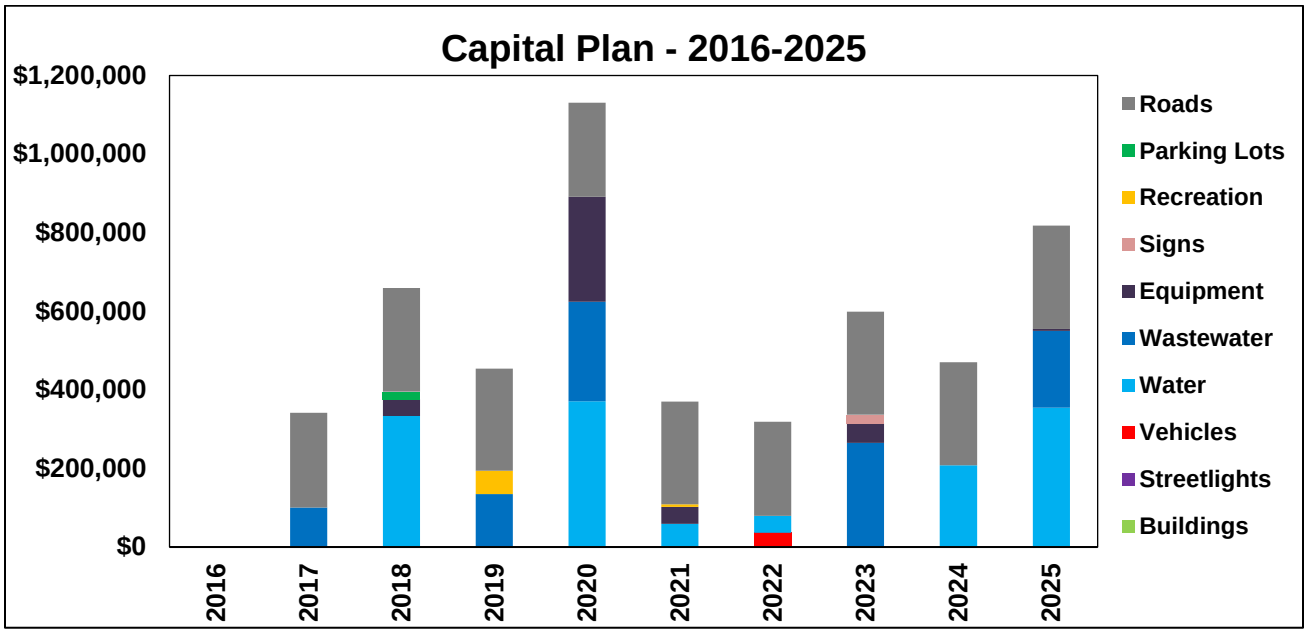


Figure 35: Summary of Capital Plan 2016-2025

A detailed project-by-project breakdown of this Capital Plan and all proposed or consultant/study recommended projects are included in the capital project list in Appendix A.

9 LEVELS OF SERVICE

9.1 OVERVIEW

Levels of Service (LOS) are statements of service performance delivery. LOS is established based on Council direction, the needs or wants of the community as well as legislative and regulatory requirements. This report includes Operating Performance Indicators (OPI's) for current levels of service. Through the ongoing Asset Management process, LOS will be further defined for the Township, the Township's assets, and the community. They all are interconnected.

There is likely further effort required by the Township to address and formally define levels of service from a customer perspective. Asset management, at its root, is really about balancing the full life cycle costs of various services and the levels of service being provided. It is about knowing what levels of service customers expect and what they are willing to pay. The level of

service is a reflection of the quality, function, and capacity of the services being provided. As a Township, you might consider:

- The level of service you are currently providing to users
- The annual cost to continue to provide the current level of service
- How the level of service is expected to change in the future given current funding levels
- If you are meeting the level of service expectations of your users given the costs to provide current, increased or decreased levels of service

As a rough generalization, the higher the level of service provided, the higher the life cycle costs of providing that service. Levels of service drive the expected treatments in the management of infrastructure. Customer levels of service outline the overall quality, function, capacity, and safety of the service being provided. Technical levels of service outline the operating, maintenance, rehabilitation, renewal and upgrade activities expected to occur within the Township. When practicing asset management, it is important to first document the current level of service being provided. As asset management becomes more established within your Township, levels of service may be set through consultation with the community. However, it is critical that prior to consulting with the public, the current levels of service along with associated life cycle costs are understood.

It is also important to discuss how various levels of service may have different risks associated with them. These risks may play an important role in determining if certain levels of service are acceptable. As with all economic analysis, a sensitivity analysis should be carried out on those parameters which are more likely to be beyond the control of the organization, such as market forces affecting the opportunity cost of capital, community expectations/perception on risk and factors in the long-term, health and safety effects, community economic effects, environmental and social effects, feasibility including public support and the Township's readiness.

9.2 METHODOLOGY

The implementation of a formal Maintenance Management System (MMS), among many other items, measures the response time, lag time, total time to resolution, resources involved, and communication logs for all issues identified internally and by customers. Going forward, this type of information not only provides the basis for resource and program management decisions but is key information that will provide council and the public with the service level information in relation to the cost of service. Historically a significant portion of activities has been provided at a 'best we can do with what we have' basis. Through a review of design guidelines, and metrics being captured by the MMS, the Township of White River can re-orientate service delivery that is driven by service level expectations that incorporate Level of Service factors. To assist in better establishing Levels of Service, the Township should also consider collecting technical performance measures needed to provide information on:

- the types of failure
- the number of customers affected
- the duration of the failure
- the severity of the failure

This kind of technical performance measurement and monitoring is undertaken to support decision-making by the asset managers within an organization. It addresses issues for consideration in the effective management of the assets, such as:

- Assessing the effectiveness of the operational, maintenance and capital works program
- Review and refinement of maintenance and rehabilitation strategies and standards
- Assistance in strategic decision-making through the definition of remaining life, based on the measure being assessed, e.g. capacity of a pipe versus demand.

Benchmarking and other comparison management techniques are used both internally and for external regulation and monitoring, to assess the performance of infrastructure groups and asset owners. Each Township needs to consider developing rating systems to judge the assets from both a Township's perspective with the values that it brings to the organization, and also from a user's or regulator's perspective, in terms of the functionality, suitability, cost and service performance of the asset.

9.3 LEVELS OF SERVICE PROCESS

Some Levels of Service (LOS) for the Township can be attained through documents developed in the industry and by internally focusing on technical requirements that meet generally expected levels of operation and safety:

- Provincial Minimum Maintenance Standards (MMS) for roads, street lighting, water and drainage
- Drinking Water Quality Management System (DWQMS)
- Engineering Standards Manuals

Operating Performance Indicators – These are the main activities within each operating budget cost center. These activities (OPI's) link directly to the level of service provided by the Township. The OPI's also include maintenance tasks that help extend asset life. A good balance between asset replacement through capital funding and ongoing maintenance provides the best cost efficiency and service productivity.

9.4 OPERATING PERFORMANCE INDICATOR EXAMPLE

ROADS				
Service	**Operating Performance Indicators (OPI)**	**Current Performance**	**Target Performance**	**Timeframe**
Examples for Roads below:				
Road Maintenance & Repairs	Complete approximately X work orders per year for service requests including pothole repair, minor asphalt patching, sightline improvement, MVA clean-up.	1500	500	3 Years
Brushing and Roadside Mowing	Complete approximately X km's of brushing on roadsides annually.	N/A	50 km	2 Years
	Complete roadside mowing X times annually	2	3	3 years
Boulevard Maintenance	Twice per year cut every boulevard in the Township.	2	3	3 Years
	Annual weeding, cleaning, and caulking of X km of sidewalk and curb.	7	7	

	Maintain sight lines at intersections for vehicle and pedestrian safety.	14 Days	14 Days	Timeline Achieved
	Roads Recapped ____km's - Annual Average	8	30	2 Years
	Gravel Roads Surface Treated ___km's - Annual Average	3.5	20	2 Years
Curbing/Shoulders	Annual repair, by August, of all curbing damage in previous winter.	September	July	1 Year
Sidewalks & Walkways	Completed Inspections _____times per year	1	1	Timeline Achieved
	Sidewalks / Walkways swept _____ times per year	1	1	Timeline Achieved
Vandalism	Within X hours of notification, remove graffiti.	48	24	1 Year
Street Lighting	Service requests for street light repair completed within X hours.	5 days	48 hours	1 Year
Signs	Annual inspection and maintenance of all X stop signs.	1225	1225	Timeline Achieved
	Annual inspection of crosswalk, pedestrian, school and playground signs and beacons.	September	July	1 Year
	Annual Upgrade of X signs to diamond grade	12	25	1 Year
Snow and Ice Control	Major roads including emergency routes during winter events.	16 Hours	16 Hours	Timeline Achieved
	Residential areas – through roads first then cul-de-sacs and dead ends.	16 Hours	16 Hours	Timeline Achieved
	Residential areas will be plowed and maintained within 96 hours unless snow and icy conditions return crews back to major roads.	16 Hours	16 Hours	Timeline Achieved
VEHICLES - FLEET				
Service	**Operating Performance Indicators (OPI)**	**Current Performance**	**Target Performance**	**Timeframe**
Fleet Maintenance	Undertake preventative maintenance and repairs to meet industry standards for safety and operation.	Daily	Daily	Timeline Achieved
	Maintain fleet availability at X%.	80	100	3 Years
Small Equipment	Inventory, maintain and repair X pieces of small equipment for use by all departments.	40	40	Timeline Achieved

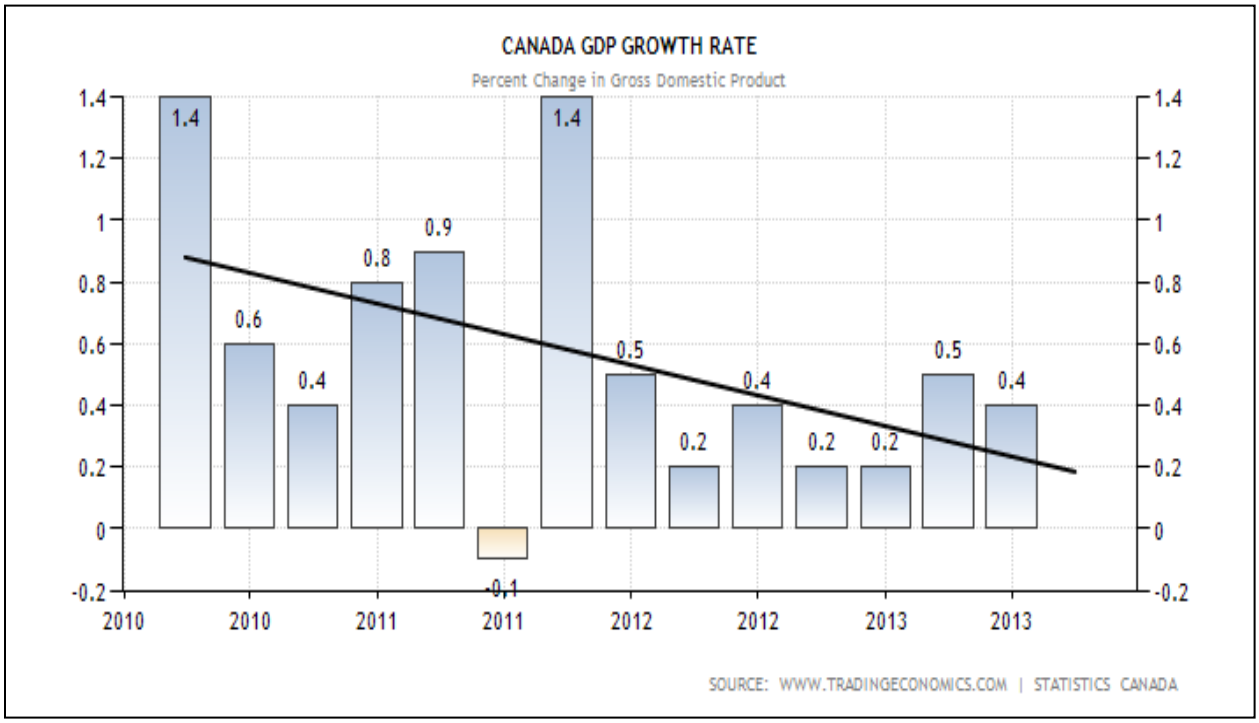
Preventative Maintenance Services	X units inspected every X months to maintain safety and fleet efficiency.	32 Units every 250 Hours	32 Units every 250 Hours	Timeline Achieved
WATER				
Service	**Operating Performance Indicators (OPI)**	**Current Performance**	**Target Performance**	**Timeframe**
Valves & Air Valves	Exercise all line valves X per year with monthly/quarterly/yearly reporting	1	1	present
Water Main Breaks	Upon notification emergency response and water shut down within X minutes.	60	60	present
	Repair completed and water service re-instated within X hours.	12	12	present
	Currently experiencing X breaks per year on average	0	>2	present
Service Connection Renewals	X renewals completed each year on average.	0		
	Service connections associated with Road Rehab Program and capital projects are checked and replaced as necessary.	at that time	at that time	present
Pump Stations	Annual painting	no	yes	2014
	Annual vegetation control	yes	yes	present
	X year cycle – rebuild control valves.	as necessary	10 years	2014
	X year cycle – rebuild or replace pumps.	as necessary	15 years	2014
	Weekly trouble shooting and repairs	yes	yes	present
	X weekly visual inspections	7	7	present
Stations	Maintain all pressure reducing stations to operate without failure.	as necessary	every 5 years	2015
	X year cycle - complete replacement of each station	as necessary	as necessary	present
	X year cycle - complete rebuild of the system.	as necessary	every 10 years	2015
	Annual painting and vegetation control.	n/a	n/a	n/a
Water Testing	100% of water samples contain no bacteriological contaminants.	100%	100%	present
	Monthly reporting	no	no	present
WPC Chlorination	Disinfects X% of **Township** supply.	100%	100%	present
	Daily data acquisition and inspection	yes	yes	present
	Daily water testing	yes	yes	present

	Monthly chlorine cylinder replacement.	n/a	n/a	n/a
	Semi-annual chlorination equipment replacement and repairs	n/a	n/a	n/a
	Annual painting and vegetation removal	n/a	n/a	n/a
	X year cycle - replacement of small piping and control valves.	as necessary	every 10 years	2014
Reservoir Chlorination	Disinfects X% of **Township** supply	n/a	n/a	n/a
Water Main Flushing	Annually flush all supply lines.	annual	annual	present
Service Call-outs	Provide 24/7 on call coverage for emergency response.	yes	yes	present

10 FINANCIAL PROJECTIONS

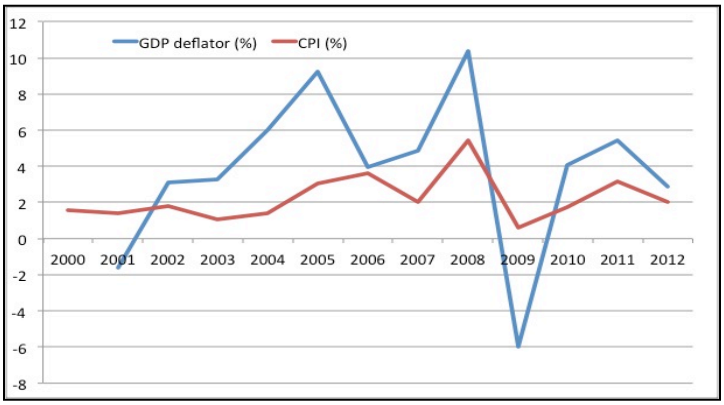
Our first steps in Financial Forecasting include compounding/inflating historical costs to Present Value (2015/16) and then further compounding/inflating these numbers to meet future requirements. To maximize the accuracy of our projections, we have developed a comprehensive "*Municipal Cost Index (MCI)".* To further fine-tune our projections, we do a micro-analysis of your geographic region.

Our basic assumptions and calculations, included within this document, are key to the planning process and serve as the base for the forecasting and predicting your future budgetary requirements and needs.



10.1 CONSUMER PRICE INDEX: OUR PERSPECTIVE

A price index measures the change in the costs of purchasing a fixed basket of goods and services in the current period, compared to a base period, typically month-over-month or year-over-year. The most widely applied measure of inflation/price index is the Consumer Price Index (CPI). Given its pervasive use in setting cost-of-living adjustments, it can be the appropriate metric when calculating the rate of consumer inflation at the national level. Major components of the CPI include housing, food, and transportation.



Source: www.marketmonetarist.com

Extending the use of the CPI into discussions about the appropriate level of tax and fee rate increases becomes problematic, however, because a government's actual experience with inflation can differ greatly from the CPI. This is because the largest expenditures for governments are typically labor, materials, and contractual services — different factors than those found in the CPI. Spending patterns that are different than those of other economic sectors. A price index that does not reflect the municipal purchasing structure does not truly reflect changes in the cost experience, and thus the purchasing power, of local governments. For instance, the CPI reflects household spending patterns that focus on shelter (27.7 percent of the Statistics Canada CPI basket), transportation (19.5 percent), food (15.5 percent), and recreation (12.9 percent) — none of which registers as leading purchase categories for local governments.

There are two main parts to the MCI calculation: the weightings of the expenditure categories (showing the relative importance of items in the index), and the inflation factor used for each component. The inflation factors for expected price changes are based on economic data from two main sources, the Conference Board of Canada (CBOC) and Statistics Canada. The key issue is to match an appropriate inflator from these external sources to the types of expenditures in each budget category. MCI can be used in the following ways:

- To measure the increase in overall municipal expenditures attributed to inflation;
- To allow managers to more closely monitor the increase in spending by expenditure category, thus making inflationary price increases or decreases more visible;
- To provide an indication of the historical, current, and future direction of prices relative to municipal expenditures;
- To explain increased expenditures attributed to inflation when submitting annual budgets.

10.2 MUNICIPAL COST INDEX

Municipal Cost Index (MCI), entails both inflationary and non-inflationary components along with their Weight and Inflators. MCI has been created in such a way that it focuses on the overall yearly impacts of a basket of goods that our clients have maximum exposure to and represents the operational/working capital needs on an ongoing basis. MCI will be used to a part of the assumptions in the following calculations:

- Municipal Cost Index is used as an integral part of Capital Planning Module, MCI served as the base for inflating/compounding historical costs to Present Value

- Financial Forecasting Municipal Cost Index will be used as a compounding/inflation factor till the 2016 financial year and then the compounding/inflationary factor will be based on reliable research reports like RBC, TD, Scotia Bank, Stats Canada to predict the rest of the years (basis Inflation rate, GDP growth rate, Population, Risk Free Rate, Market Premium Rate etc. will be considered for a constant growth rate)
- Breakdown of revenue and expenditure and predicting the sources of funds and expenses

White River's Municipal Cost Index is attached as Appendix C.

10.3 FINANCIAL STRATEGY ASSUMPTIONS

The following summarizes the key assumptions used in the preparation of the financial strategy for major assets:

- 2.3% annual operating income increase (property taxation, base scenario)
- 2% annual increase in user fees and 1% increase in other revenues
- 2% annual operating expenditure increase
- 2% annual increase in capital replacement costs
- Gas Tax Fund $63,994 (not inflated)
- Existing funding sources, as identified in the 2015 FIR
- No growth-related capital has been included in the analysis as the financial strategy relates to the replacement of existing assets.
- Capital replacement needs as identified in the previous section of this report

It is important to keep in mind that assumptions may significantly change over time. In addition, capital replacement cost estimates may vary from current projections. As such, there is a need to monitor the financial strategy over time.

10.4 FUNDING REQUIREMENTS

In our efforts to create the best plan moving forward for the Township, ISI decided to create two scenarios:

- Capital Plan including infrastructure deficit (backlog)
- Capital Plan (excluding infrastructure deficit)

A Capital Plan that would eliminate the deficit over the next 10 years would require the Township to make an average annual capital investment of $1.5 MM as compared to the current contribution of $122,953. By our calculations, the Township would be required to increase property taxes by in excess of 14% annually. Considering that White River has a high percentage of its citizens retired and on fixed income, the acceptance of this scenario is highly unlikely. The Township would need to be successful in attaining substantial government grants/funding to deal with its infrastructure deficit.

Still, we believe that self-sufficiency should be the Township's objective. The Township will continue to experience an infrastructure deficit like many other similarly-sized municipalities. By our calculations, the average annual capital requirement is $294,617, and the existing contribution to the capital program is $122,953. The Township needs to increase its current contribution and build reserves so that it can prepare to maintain service levels and meet future capital requirements. The Township's strategies to close/reduce the gap will be discussed in the next section of the report.

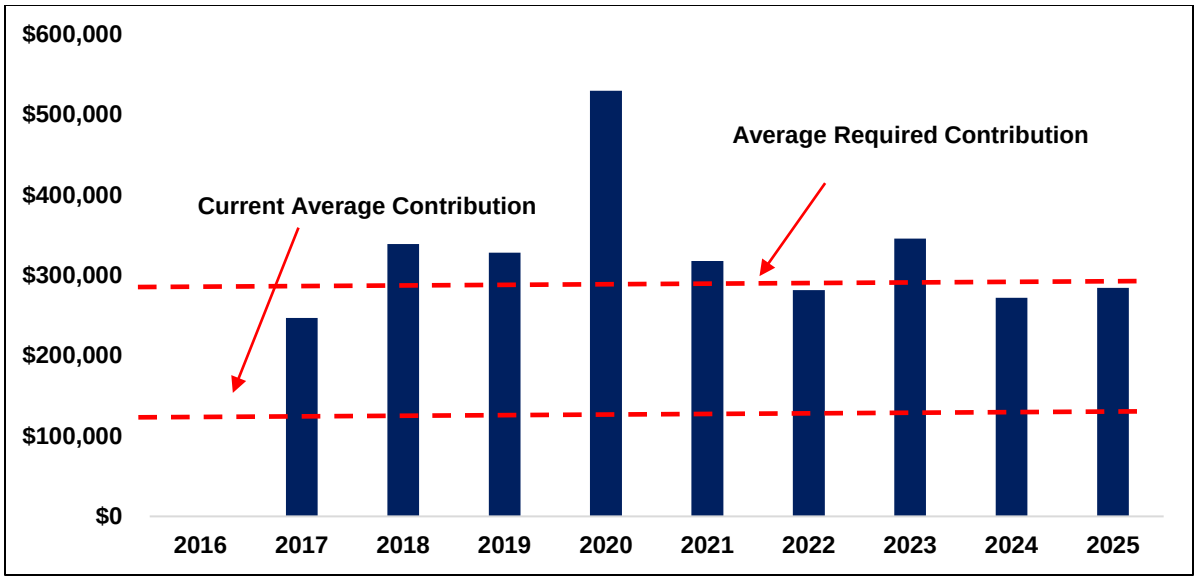


Figure 36: Capital Program Contributions (Required vs. Existing)

11 FINANCIAL STRATEGIES – THE INFRASTRUCTURE GAP

Financial sustainability requires that a Township ensures that there are sufficient resources to support the delivery of services for which the Township bears responsibility. Given the need and benefit for further infrastructure investment in order to protect, sustain, and maximize the use of White River's infrastructure assets, a number of options and strategies have been considered. Through the road optimization software, for example, strategies are recommended which allow for an increased deficit on low volume rural roads, while directing capital to more critical non-transportation services. Deficit elimination is outside the financial capability of the Township, but much can be done to ensure non-priority items can be put on the back-burner while critical services remain adequately funded.

11.1 STRATEGY 1: SPECIAL LEVY

General Infrastructure

ISI recommends that the Township implement a special infrastructure levy for the replacement and repair of existing infrastructure. For example, a special infrastructure annual levy increase of 3.5% would generate sufficient revenues to reduce the tax-related infrastructure gap beyond 10 years and meet the requirement of the projected $294,617 annual contribution.

By increasing the levy by an additional 3.5% annually the Township will increase the funds available over the 10-year period by approximately $986,040. This reflects the significant power of compounding:

- In year one, the additional 3.5% special levy would generate an additional $31,479
- In year 10, with an assumed 3.5% special infrastructure levy, this would generate an additional $197,924

The following table is provided for illustrated purposes to help explain the significant potential through a modest levy increase to address the tax infrastructure gap:

3.5% Special Infrastructure Levy		
2017	$	31,479
2018	$	48,589
2019	$	66,666
2020	$	85,752
2021	$	105,891
2022	$	127,129
2023	$	149,514
2024	$	173,095
2025	$	197,924
Total	***$***	***986,040***
Average increase	***$***	***109,560***

Water Wastewater System

For water wastewater services, ISI completed a rate study in 2015. As per the recommendation, ISI and Township council agreed to increase the water rate by 7.5% annually for the years 2016 through 2023 and 3% from 2024 onward, and to increase the wastewater rates by 9% annually from 2016 through 2023 and 1.8% from 2024 onward. ISI believes that these rates will be enough to tackle the infrastructure deficit and capital expenses in the coming years. For detailed analysis please refer to Water Wastewater Rate Study.

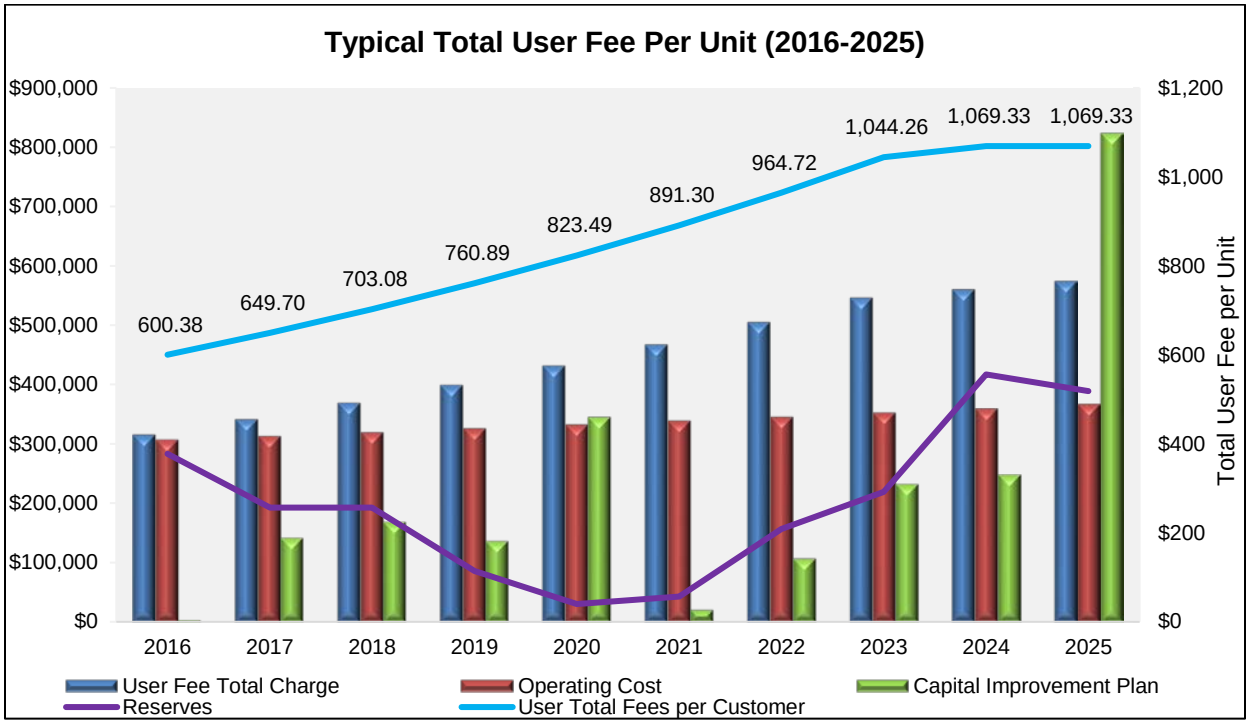


Figure 37: Typical Total User Annual Fee – Residential

11.2 STRATEGY 2: RETHINKING INFRASTRUCTURE SERVICES

The potential exists to reduce infrastructure costs by determining the most cost-effective options for all capital programs on new or rehabilitated infrastructure by pursuing life cycle costing analysis (discussed earlier in the report). Further, as indicated previously, the timing to replace assets is based on the analysis undertaken using theoretical assumptions in some cases. Due to the limited funds available, there will be a need to identify where the replacement of some assets may be deferred.

Many municipalities develop rehabilitation and replacement programs on a system-wide program basis versus annual project by project basis. This will allow for improved prioritization and coordination of required work. Recognizing the significance of the infrastructure deficit, the Township should consider a services review with the objective of re-evaluating the priorities of the community and cost of services provided.

11.3 STRATEGY 3: STRATEGIC USE OF DEBT

In some circumstances, it makes good sense to incur debt today rather than take the consequence and cost of allowing assets to deteriorate to a point where replacement or reconstruction would substantially increase cost to the community. The concepts involved with changing the oil in our cars and fixing the roof of our house also apply to preventive maintenance on road networks, for example. Keep a road in good shape with regular maintenance and you will never face a full reconstruction.

Due to the backlog in the tax-supported programs, there is a need to examine the cost/benefit of addressing these needs through the issuance of debt. Using debt strategically can provide capital funding flexibility by allowing certain infrastructure to be built and used before sufficient revenue has accumulated to offset the needed investment. Debt is frequently issued and considered a standard practice in Municipalities for capital projects that are long term in nature and that benefit future taxpayers, thereby spreading the costs across future years. As such, debt promotes inter-generational equity in that infrastructure is paid for by those who use it. With favourable interest rates and significant backlog, the Township may wish to consider the need to issue debt to expedite capital replacement. Infrastructure Ontario interest rates at the time of this report are as follows:

- 10 year – 2.64%
- 15 year – 3.05%
- 20 year – 3.33%

For example, if the Township were to issue $1 million in debt to address a portion of the backlog deemed to be the highest priority that was beyond reserve availability, the debt payments would be approximately $88,000 (assuming 15-year term). A debt management policy improves the quality of decisions, identifies policy goals and demonstrates a commitment to long-term financial planning, including a multi-year plan. Adherence to a debt management plan signals to rating agencies and capital markets that the Township is well managed and is well positioned to meet its obligations in a timely manner. The Province regulates the amount of debt that Municipalities issue by setting an annual repayment limit for each Township (25% of a Township's own source revenues). Based on our experience, Municipalities typically establish thresholds below the Provincial limit to take into consideration taxpayer affordability and to ensure flexibility.

In addition to a debt guideline, monitoring also becomes important when considering the idea of the increased use of debt as a funding source to ensure that it is being used in a fiscally responsible manner. Government Finance Officers Association recommends that Municipalities adopt policies that specify appropriate uses for debt.

The following strategies are recommended to determine the most appropriate time to issue debt

- Debt will be proportionate to the Township's tax base and will not put an excessive burden on operating expenditures.
- Outstanding and planned debt levels will not exceed an amount that can be supported by the existing and projected tax revenue base. Debt policies will focus on:
  - projected debt requirement
  - limits and benchmarks
  - term and structure of debt
  - use of reserves to offset debt issuance
- Long-term debt for the replacement and refurbishment of existing capital assets will be reduced and a planned process will be developed whereby an annual contribution will be made to meet lifecycle needs of all assets.

The following policies are recommended to manage debt within the Township:

- Tax Debt Charges as a percentage of Tax Own Source Revenues will not exceed 10%.
- Long-term debt financing will be restricted to specific project types:
  - Increased/new services to residents for new initiatives
  - New, non-recurring infrastructure requirements
  - Projects which are supported by a business plan that shows revenues will cover capital and interest costs
  - Projects where the cost of deferring expenditures exceeds debt servicing costs
  - Project costs not recovered from Development Charges
  - Projects tied to third party matching funding

(Note: These restrictions may have to be phased in to meet short-term budget challenges.)

- The length of the term of debt will not exceed the useful life of the underlying asset.
- The Township will monitor and report on all forms of debt annually.

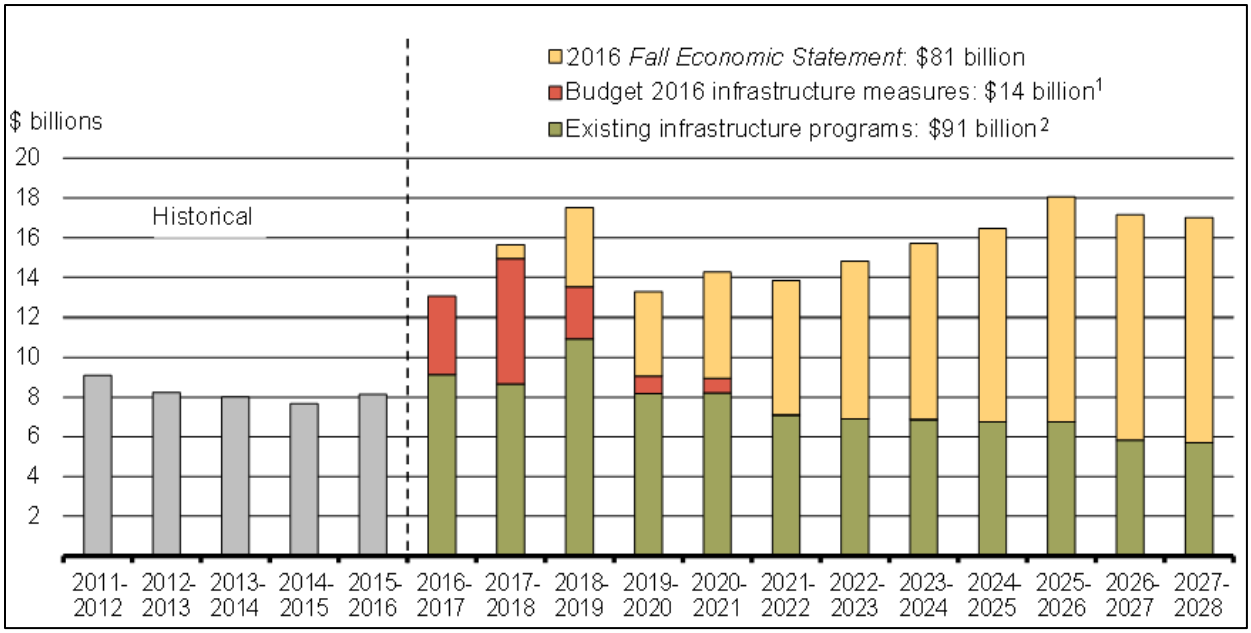
11.4 STRATEGY 4: USE OF GRANTS

It is well established that the condition of Canada's municipal infrastructure is one of the keys to underpinning, maintaining and enhancing Canada's economic productivity and competitiveness. It is therefore clearly in the national and provincial interests for the federal and provincial government to institute permanent and sustainable infrastructure funding. Along with the strategic use of debt, the Township can also apply for the grants available from the Provincial and Federal governments. Some significant components of the infrastructure deficit can be dealt with through close monitoring of grant programs and a careful expression of interest to access these funds.

FEDERAL GOVERNMENT INVESTING IN CANADA

Across the country, people and communities are in need. The middle class and those working hard to join it need the opportunities that come with good, well-paying jobs, and communities need help to maintain, improve and expand the things that make Canada's towns and cities great places to live.

Investing in Canada's infrastructure builds strong communities and helps to strengthen and grow the middle class, setting the stage for sustained economic growth in the future. In Budget 2016, the government made a down payment on future growth by making immediate investments of $11.9 billion in public transit, green infrastructure and social infrastructure. This 2016 Fall Economic Statement strengthens the government's commitment to long-term growth for the middle class. It proposes an additional investment of $81 billion over 11 years, starting in 2017–18, in public transit, green infrastructure, social infrastructure, transportation that supports trade, Canada's rural and northern communities, and smart cities. The government will also establish a new Canada Infrastructure Bank to provide innovative financing for infrastructure projects, and help more projects get built in Canada, where public capital can be leveraged.



Taking into account existing infrastructure programs, new investments made in Budget 2016 and the additional investments contained in this Fall Economic Statement, the government will make a total investment in Canada's communities of more than $180 billion.

This commitment is unprecedented in Canadian history.

ONTARIO PROVINCIAL GOVERNMENT

As announced in the 2016 Ontario Economic Outlook and Fiscal Review, the Province of Ontario plans to invest more than $160 billion over 12 years, starting in 2014–15.

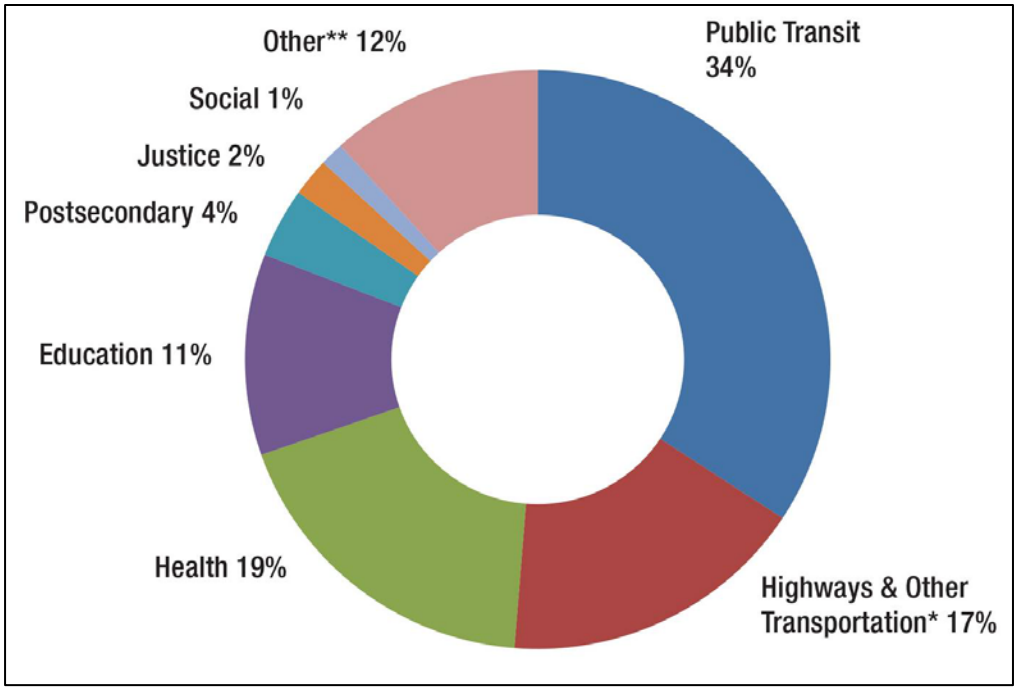


Figure 38: The Province's 12-year infrastructure plan by sector (%)

The infrastructure plan includes investments in Moving Ontario Forward for public transit, highways and other priority infrastructure projects. The infrastructure expenditures table below outlines all planned investments over 12 years, starting in 2014-15, and shows they touch all key sectors.

Sectors ($M)	2014-15 Actuals	2015-16 Actuals	Outlook 2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	12-Year Total
Public Transit	3,554	3,967	5,381	6,632	8,053	8,528	7,656	6,742	4,983	3,378	2,112	1,807	62,791
Highways & Other Transportation*	2,323	2,372	2,919	3,163	3,248	3,340	2,947	2,582	2,287	2,047	1,966	1,946	31,139
Health	3,568	3,225	3,192	2,745	2,774	2,775	3,062	2,243	2,339	2,816	2,952	1,914	33,603
Education	1,833	1,590	2,561	1,932	1,865	1,808	1,686	1,558	1,434	1,432	1,432	1,396	20,526
Postsecondary	519	624	1,091	1,035	593	450	466	467	468	464	459	456	7,093
Justice	144	150	255	314	566	626	573	396	230	217	216	216	3,903
Social	231	267	814	353	243	183	68	54	52	51	51	51	2,419
Other**	645	556	1,184	1,299	1,936	2,071	1,935	2,072	2,647	3,555	1,680	1,676	21,256
Total Infrastructure Expenditure	12,817	12,751	17,396	17,474	19,277	19,779	18,393	16,113	14,440	13,960	10,869	9,463	182,731
Less: Other Partner Funding & Federal Contributions	1,661	1,931	3,240	2,498	2,331	1,357	1,481	1,300	1,337	1,349	1,293	1,214	20,991
Total	**11,156**	**10,820**	**14,156**	**14,975**	**16,947**	**18,422**	**16,912**	**14,812**	**13,103**	**12,611**	**9,576**	**8,249**	**161,740**

Figure 39: 2016-17 Infrastructure Expenditures Table
(Source: 2016 Ontario Economic Outlook and Fiscal Review)

12 RECOMMENDATIONS

12.1 SOTI RECOMMENDATIONS

The SOTI/Capital Plan identifies a number of asset-specific recommendations. However, there are six recurring recommendations that should be addressed in future strategic asset management initiatives:

1. Develop, through more detailed analysis, a plan for allocating the additional funds to the operating and/or capital budgets, as required, in order to successfully develop, implement, and maintain an approved asset management plan;
2. Develop a policy and implement a strategy to reach long-term sustainable funding for each of the assets covered in this SOTI Report;
3. Implement a comprehensive budget structure along service delivery lines, so that service managers can adequately know what the true total cost of their service is (including asset management, operations, capital, and borrowing costs).
4. Review the selection and use of rehabilitation strategies on life-cycle costing and on a return-on-investment (ROI) basis.
5. Review operating and maintenance practices, balancing least life-cycle cost against level of service and risk exposure, on a business-case basis using InfraGuide Best Practices and other industry sources;
6. Provide regular updates to the SOTI Report Card and Analysis

12.2 CAPITAL PLAN RECOMMENDATIONS

1. Asset condition assessment of capital assets should be considered wherever feasible. The application of a standard life expectancy of an asset reflects a financial approach (PSAB 3150). Age-based condition assessment has the least level of confidence for building a capital plan.
2. The Township of White River could consider releasing a policy defining its strategy and intention as it pertains to the infrastructure deficit, including communications to the general public.
3. The Township needs to build a definitive policy with respect to it's infrastructure deficit.
4. The Township should proactively define organizational responsibilities to maintain the asset inventory including proposed and actual project cost information, updating the data as assets are acquired or betterments are added to existing assets and projects are started and completed. In this manner, the accuracy of future Capital Plans will increase over time.
5. The Township should consider establishing as policy the following guiding principles, that it be:
    a) **Customer Focused:** To have clearly defined Levels of Service and applying asset management practices to maintain the confidence of residents in how the Township of White River assets are managed.
    b) **Forward Looking**: To make the appropriate decisions and provisions to better enable its assets to meet future challenges, including changing demographics and populations, customer expectations, legislative requirements, technological and environmental factors.

c) **Service Focused**: To consider all the assets in a service context and taking into account their interrelationships as opposed to optimizing individual assets in isolation.
d) **Risk-based**: To manage the asset risk associated with attaining the agreed levels of service by focusing resources, expenditures, and priorities based upon risk assessments and the corresponding cost/benefit recognizing that public safety is the priority.
e) **Value-Based/Affordable**: To choose practices, interventions, and operations that aim at reducing the life cycle cost of asset ownership, while satisfying agreed levels of service. Decisions are based on balancing service levels, risks, and costs.
f) **Holistic**: To take a comprehensive approach that looks at the "big picture" and considers the combined impact of managing all aspects of the asset life cycle.
g) **Systematic**: To adopt a formal, consistent, repeatable approach to the management of its assets that will ensure services are provided in the most effective manner.
h) **Innovative**: To continually improve its asset management approach, by driving innovation in the development of tools, practices, and solutions.

6. To meet the goals and objectives of this policy, senior management could consider:
   a) The creation and maintenance of a Comprehensive Asset Management (CAM) governance structure to lead the development of AM tools and practices and to oversee their application across the organization.
   b) Adopt a Comprehensive Asset Management Strategy (AMS) to:
      - Establish, document and continually adhere to industry recognized asset management protocols;
      - Develop asset management knowledge and competencies aligned with recognized competency frameworks;
      - Entrench lifecycle costing when evaluating competing asset investment needs across the Township assets;
      - Monitor the performance of the assets and track the effectiveness of AM practices with a view to continuous improvement;

12.3 LEVEL OF SERVICE RECOMMENDATIONS

1. We recommend that the Township incorporate a Level of Service analysis prior to resolving the infrastructure deficit in order to maximize the impact of their capital investments with the objective to:
   - Refine levels of service that balance customer expectations with risk, affordability and timing constraints as it pertains to the Township's unique requirements;
   - Adopt risk-based decision-making processes that consider the likelihood of asset failure and the consequence of a failure with regards to impacts on safety and levels of service;
2. To assist in better establishing Levels of Service, the Township should consider collecting technical performance measures required to provide information on:
   - the types of failure
   - the number of customers affected
   - the duration of the failure
   - the severity of the failure

3. To support decision-making for effective management of the assets, the Township should consider technical performance measurement and monitoring, undertaken by the Township such as:
    - Assessing the effectiveness of the operational, maintenance and capital works program
    - Review and refinement of maintenance and rehabilitation strategies and standards
    - Assistance in strategic decision-making through definition of remaining life, based on the measure being assessed

12.4 FINANCIAL STRATEGY RECOMMENDATIONS

A financial strategy to support the asset management plan is a dynamic document that should be updated and re-evaluated on an ongoing basis. The Township should give due consideration to the following points:

1. The Township has insufficient funds from existing sources to proactively manage its infrastructure and will need to prioritize its requirements to maximizing the impact of existing financial resources.
2. The Township has a growing infrastructure deficit which is serious considering its population and tax base. A special infrastructure levy will help the Township to reduce the gap over time and should be taken into consideration.
3. In the event that the Township implements an infrastructure levy, a percentage of the additional funds should be transferred into a reserve so that the Township has some flexibility to prioritize and sustain future infrastructure and service level requirements.
4. The Township needs to be proactive in reviewing and capitalizing on the upcoming Provincial and Federal programs, as the Township will need financial assistance to close its infrastructure deficit. It should seek government grants to be able to undertake the capital projects outlined in this Asset Management Plan.
5. The Township needs to be proactive in reviewing funding options including Infrastructure Ontario Lending Policies, Private Public Partnerships, user fees and other funding options to have an understanding of financing options.
6. The Township needs to embrace the principles of Asset Management to formulate assumptions, projections, and strategies going forward. The Plan should be modified on an ongoing basis, taking into account changes in the municipal environment.
7. The Township should track and build awareness of the results of its projections on current operating and capital spending and funding levels with the objective of fine-tuning the forecasting process.
8. The Township should continue the analysis and examination of key financial goals and strategies that guide future priorities and expenditures.

13 CONCLUSION

As a general comment, the Township of White River is hampered by limited revenue and extensive infrastructure. ISI worked with staff who were knowledgeable and committed. The information we received was, by in large, accurate and well organized. The overall state of the linear infrastructure at the Township is in line with the vast majority of municipalities in this Province. As highlighted in the Report Card, the current state of the linear infrastructure, based on available condition rating and age analysis, presents a picture of the Township's linear assets

to be in need of substantial work and the Township should continue to be proactive in their strategies, so as to extend asset useful life and avoid major rehabilitation/reconstruction or replacement costs.

It is highly recommended that the Township of White River embrace the principles of Asset Management. Managing existing infrastructure, doing the right thing, at the right time, involves knowing and actually doing the most cost-effective maintenance, repair, rehabilitation or replacement activity at the right time throughout the entire lifecycle of the asset. Beyond cost savings, assets need to be viewed in terms of their ability to enhance quality, function, capacity and safety of the service being provided.

The process of implementing Asset Management is rife with challenge. It requires clear direction from Council. It requires significant cross-departmental cooperation. It requires the allocating of time, energy, and resource to assume new responsibilities. It requires consultation with the community. It requires working with constrained budgets to balance priorities. Because infrastructure management deals with assets that have long lifespans, it may take years before a substantial financial return on investment (ROI) becomes apparent. Still, managing existing, capital intensive, public sector infrastructure assets could provide very significant benefits (i.e. 20 – 40% reductions in life cycle costs).

Finally, the Township will likely be faced with difficult decisions over the next years, and the infrastructure deficit will continue to widen without corrective action. The Council should put together a public communication program to engage the community in discussing the true cost of services and the assets required to provide those services. Community and stakeholder buy-in for an implementable asset management plan and service levels in line with public expectations and willingness to pay are critical to the success of the program.

APPENDIX A - DETAILED LIST OF CAPITAL PROJECTS

Click on the Dropbox hyperlink below for a detailed list of your Capital Projects over the next 10 years:

Click here to view

APPENDIX B – ASSET USEFUL LIFE

Departments	Assets	Useful Life as per CIP (Years)	Source
Transportation Network	HCB Roads	50 (Total Reconstruction)	Infrastructure Report
	LCB Roads	50 (Total Reconstruction)	Infrastructure Report
	Gravel Roads	(Recurrent Resurfacing)	Infrastructure Report
Structure	Culverts	50	Infrastructure Report
Sewer Network	Sewerline (Storm)	50	As per the TCA Policy
	Sewerline (Waste Water)	50	As per the TCA Policy
	Lagoon	50	As per the TCA Policy
	Sewer Structure (Storm)/Ditches	50	Infrastructure Report
	Catch basin (Storm)	50	As per the TCA Policy
	Manhole (Waste Water)	40	As per the TCA Policy
Water Network	Waterlines	50	As per the TCA Policy
	Water Services	50	As per the TCA Policy
	Hydrants	40	As per the TCA Policy
Equipment	Equipment	Varies	As per the TCA Policy
Fleet	Vehicle	Varies	As per the TCA Policy
Parks	Recreation Area	Varies	As per the TCA Policy
Facility	Treatment Plant	Varies	As per the TCA Policy
	Buildings	40	As per the TCA Policy

Rating Category	% Remaining Service Life (RSL)	Definition
Good	61% - 100%	The infrastructure in the system or network is generally in good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention
Fair	41% -60%	The infrastructure in the system or network shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies
Poor	< 40%	The infrastructure in the system or network is in poor condition and mostly below standard, with elements approaching the end of their service life. A large portion of the system exhibits significant deterioration

APPENDIX C – MUNICIPAL COST INDEX

MCI(Region 1)								
COMPONENTS	Weights	Inflators for Each Component						
		2009	2010	2011	2012	2013	2014	2015
Wages and Salaries and Benefits	32%			2%	-2%	2%	-4%	6%
Interest on Long Term Debt	2%			5%		19%	4%	1%
Materials	28%			18%	-2%		12%	7%
Contracted Services	22%		9%	-2%		5%	2%	2%
Rents and Financial Expenses	2%				-9%			3%
External Transfers	6%		-13%					9%
Amortization	8%							
Average MCI	**2.40%**							

Notes:

- Municipal Cost Index**,** is calculated to better represent the municipal purchasing power and cost experience, so ISI will use 2.40% as the compounding/inflationary factor up until 2016
- Municipal Cost Index represents the basket of goods and services which is consumed/used by Municipalities and represents the operational/working capital needs on an on-going basis
- Assigned weights represent the percentage of services/goods consumed out of total spend
- Inflators represent the year on year changes in the components
- Component's weight and inflators, sum all represents the overall cost experience for the Municipalities/region as compared to CPI
- MCI is created as to minimize the variation/deviations of cost/purchasing experience in the region
- The sources of Municipal Cost Index are the Financial Statements for your specific region
- Outliers have been removed from the data for Municipal Cost Index calculation to average out/standardized data