# Asset Management Plan

# 2019-2029

# The Municipality of St.-Charles

**Project No. 18-325**

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# 1 EXECUTIVE SUMMARY

The Municipality of St.-Charles is undertaking a detailed evaluation of all its existing infrastructure in order to update a long-term Asset Management Plan, put the municipality 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 Municipality of St.-Charles 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 the Municipality's CAO to accumulate the 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 Municipality's infrastructure deficit.

The Municipality's infrastructure deficit is defined as the added investment that would be required to maintain a Municipality's infrastructure at appropriate service levels and in a good state of repair today. Based on our calculations, St.-Charles infrastructure deficit is calculated to be $7.2 million dollars. The Municipality's infrastructure deficit is serious, requiring a significant annual contribution to eliminate it within a 10-year period, which is well outside the Municipality's current financial capability and needing an infrastructure surcharge or government grants to deal with it. The greatest portion of the infrastructure deficit, $5.7 million, is with St.-Charles' buildings (PW Garage and Arena). The Municipality will have to have some discussions as to the extent of the renovations and/or replacement of these structures. The Roads infrastructure deficit is $231,470. 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 Municipality's current/projected capital contributions in relation to its current/projected needs. The Municipality is currently contributing $199,706 per annum to its capital program but has a requirement to contribute $360,183 per annum. Without corrective action, the infrastructure deficit will continue to grow. As highlighted in the SOTI Report within this document, the Municipality's roads, water and storm water systems are in Good condition, the sidewalks and bridge are in Poor condition, while the Municipality's other major linear assets, the large culverts and wastewater system, 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 Municipality of St.-Charles 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.

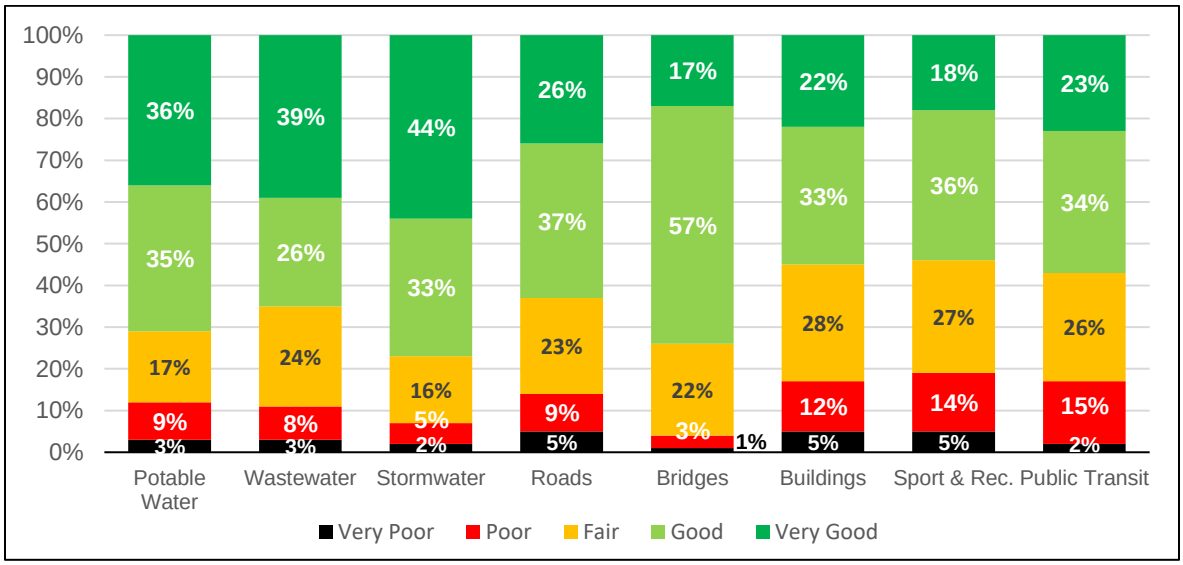



**Figure 1: Physical Condition Ratings by Asset Category**

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 St.-Charles 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.

### 2019

- Invited to present, "**Defining Needs for Optimized Road Asset Management for Gravel Road Networks in Canada**", Ontario Good Roads Association (OGRA) Conference.
- Featured in OGRA's Milestones Magazine Conference Issue, February.
- Invited to present to the Canadian Public Works Association, "**Optimized Management of Gravel Road Network**", hosted in Saskatoon.

### 2018

- Featured in the July 2018 American Public Works Association Magazine, Page 72/73, *https://www.apwa.net/MyApwa/Apwa_Public/Resources/APWA_Reporter_Magazine-issue_index.aspx?year=2018&month=07&an=5795.*
- Featured in ReNew Canada article (March/April Issue), "**Saving Public Roads II**", including interviews with Town of Tillsonburg and City of Sarnia regarding the positive impact of preventive maintenance and optimization software.
- Invited to present, "**Empirical Bayes-based Markov Chain Deterioration Modelling for Municipal Sewer Systems, Life Cycle Analysis and Assessment in Civil Engineering**", Sixth International Symposium on Life-Cycle Civil Engineering, October 28-31, Ghent, Belgium.

- Invited to do a podium presentation, "**Maximizing Investment Efficiency in Municipal Pavement Preservation Programs**", National Conference on Transportation Asset Management, Transportation Research Board (TRB), San Diego, CA, US.
- Invited to present, "**Defining Needs for Optimized Road Asset Management for Gravel Road Networks in Canada**", Transportation Association of Canada (TAC) Conference, Saskatoon, SK.
- Invited to present, "**Managing Paved and Unpaved Roads at Minimum Cost**", at the Canadian Network of Asset Managers Annual Conference, Windsor, ON.
- Invited to present, "**Collaborative Deterioration Modeling for Risk-Informed Asset Management of Municipal Sewers**", Canadian Network of Asset Managers Annual Conference, Windsor, ON.

**2017**

- Introduced DOT (Decision Optimization Technology) Roads software, based on input from Golder Associates engineering team and contributions from 50 municipal clients from across Canada.
- Presented, "**Unleashing the Cost Savings of Optimized Road Asset Management to Municipalities"**, at the Canadian Society for Civil Engineering (CSCE) AGM, Vancouver, BC.
- Presented, "**Substantial Road Capital Budget Savings**" at the Canadian Network of Asset Managers Annual Conference, Calgary, AB.

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 continue to improve our methodology to provide you with the best possible asset management plan.

## 3.1 ISI ROAD NETWORK PREVENTIVE MAINTENANCE

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.

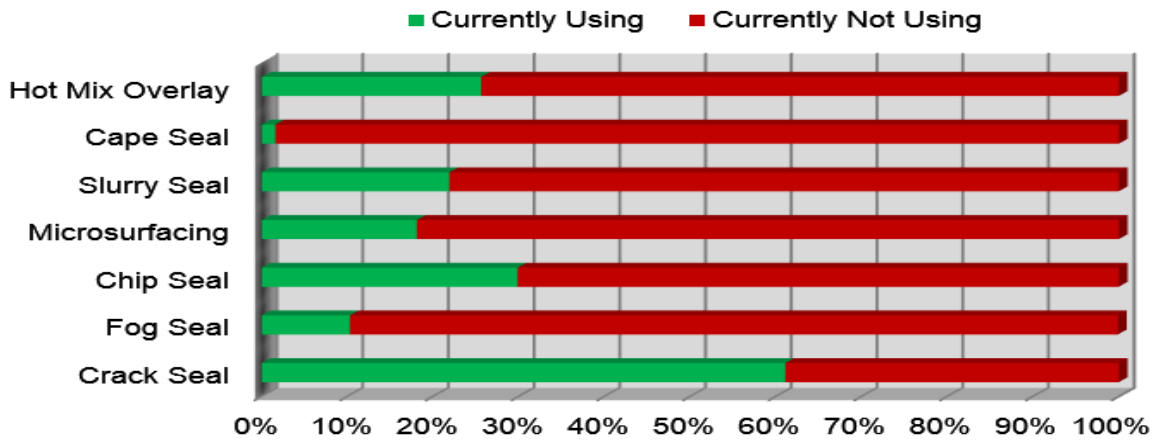



**Figure 3: Current Application of Preventive Maintenance Across Canadian Municipalities**

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.

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.

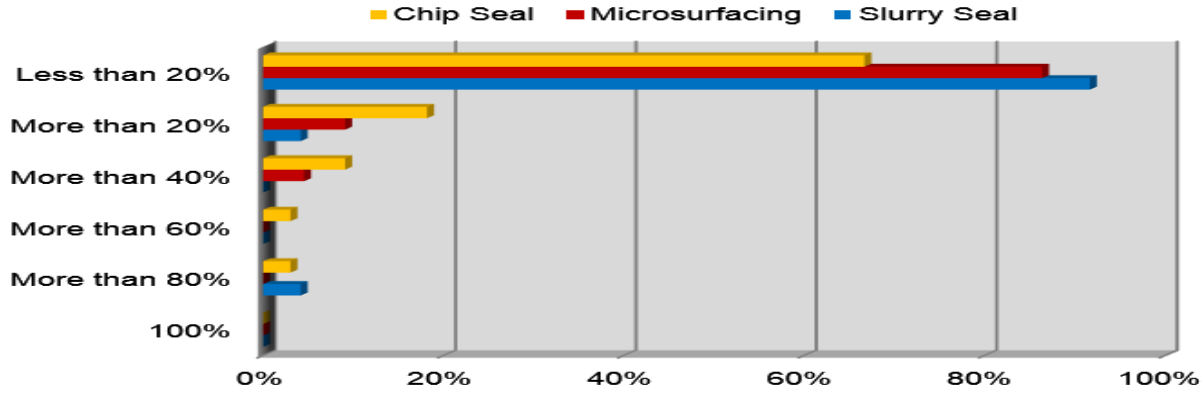



**Figure 4: Application of Preventive Treatments According to Best Practices**

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 DOT (Decision Optimization Technology) Roads 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).

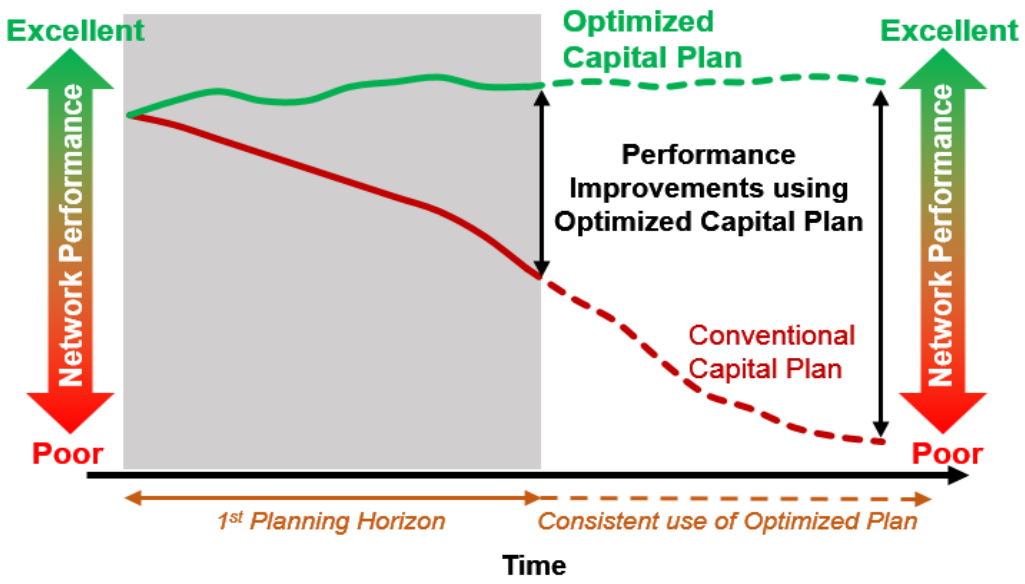



**Figure 5: Optimized vs. Conventional Capital Planning**

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 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 Municipality's asset inventory and its current condition. Infrastructure Solutions has been contracted to assist the Municipality 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 Municipality. The Capital Plan provides both a high-level assessment of projected Capital expenses and a detailed future project by project costing for the Municipality's review and confirmation. Our objective is to give the Municipality the analytical tools and information necessary to implement a comprehensive and cohesive asset management program. We have determined that the Municipality has a significant backlog of assets in need of betterment or replacement.

Dealing with aging infrastructure requires that the Municipality 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 Municipality 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 Municipality of St.-Charles 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

Municipality 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 Municipality'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 Municipality'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 Municipality'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 Municipality's review. The grouping of these assets and asset replacements were taken from the PSAB files provided by the Municipality, 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 St. -Charles TCA Policy, a **$5,000 capital threshold limit** is used for the majority of the assets, while a threshold limit of $25,000 is specified for buildings, bridges 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 generally accepted Asset Management guidelines.

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

**Linear Assets:**

- Roads – Paved and Gravel
- Sidewalks

- Bridge and Culverts
- Water Network
- Storm Water Network
- Wastewater Network

**Non-linear Assets:**

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

| Asset Type | Replacement Cost |
|---|---|
| Water System | $20,177 |
| Wastewater System | $4,243,674 |
| Stormwater & Small Culverts | $863,059 |
| Roads | $34,277,687 |
| Bridge & Large Culverts | $1,268,768 |
| Buildings | $11,183,300 |
| Vehicles | $2,372,626 |
| Street Lights | $36,442 |
| Recreation | $726,724 |
| Sidewalks | $350,873 |
| Equipment | $1,084,307 |
| Signs | $30,729 |
| **Total RC 2018** | **$56,458,366** |

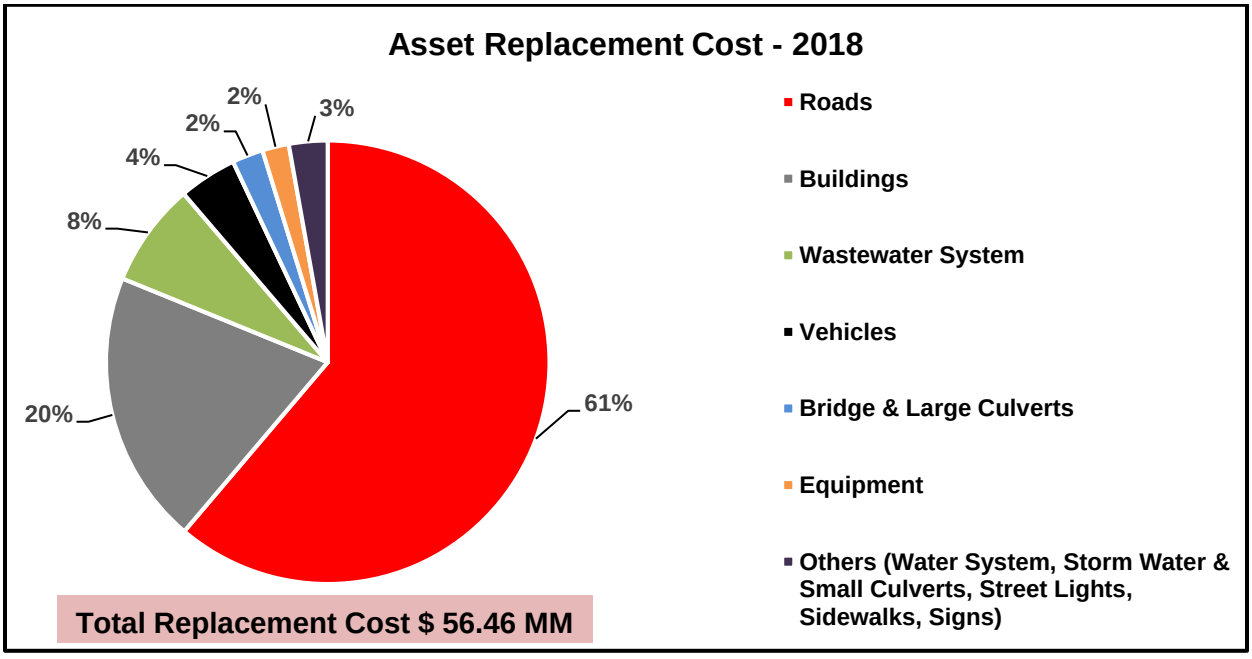



**Figure 6: Asset Replacement Cost by Category**

## 5.1 ROAD NETWORK

The Municipality of St.-Charles has a total of 105.3 km of roads in total in the form of Gravel (G/S), Surface Treated LCB) and Paved (HCB) roads.

### 5.1.1 ROAD GEOMETRICS

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

| Surface Type | Length (km) | Percentage |
|---|---|---|
| Gravel | 86.3 | 82.0% |
| Hot Mix Asphalt | 0.7 | 0.7% |
| Surface Treated | 18.3 | 17.4% |

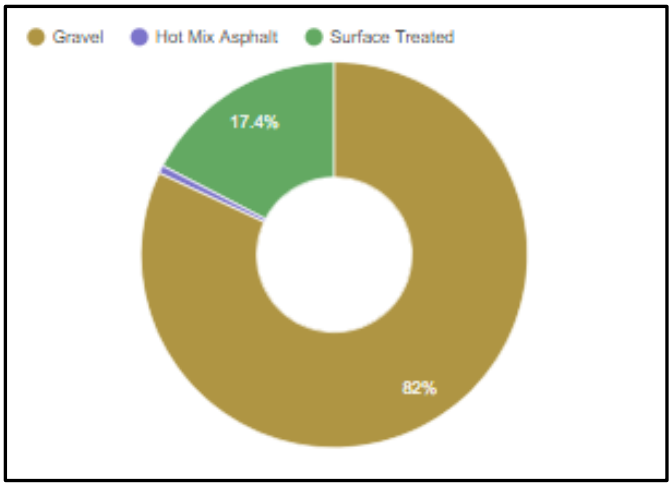



**Figure 7: Road Surface Types by Section Length**

**Condition-Based Analysis for Roads**
The state of the infrastructure for roads is determined through a condition based analysis. The following summarizes the Network Pavement Condition Index (PCI) weighted by section length:

| Condition | Length (km) | Percentage |
|---|---|---|
| Poor | 12.9 | 12.3% |
| Fair | 31.3 | 29.7% |
| Good | 12.3 | 11.7% |
| Excellent | 48.8 | 46.3% |

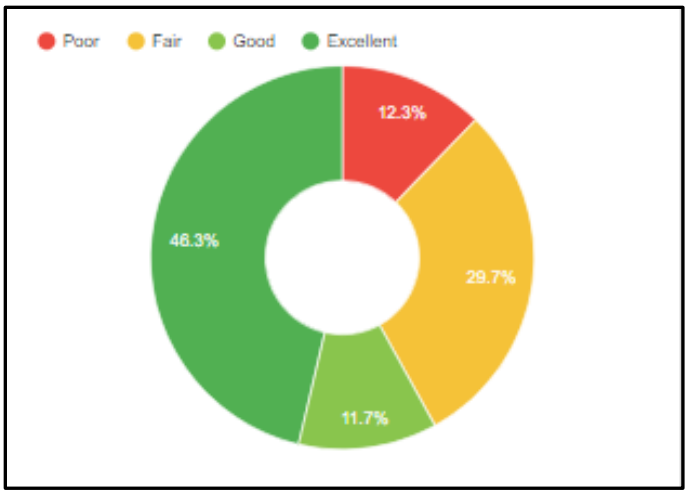



**Figure 8: Road Network Condition**

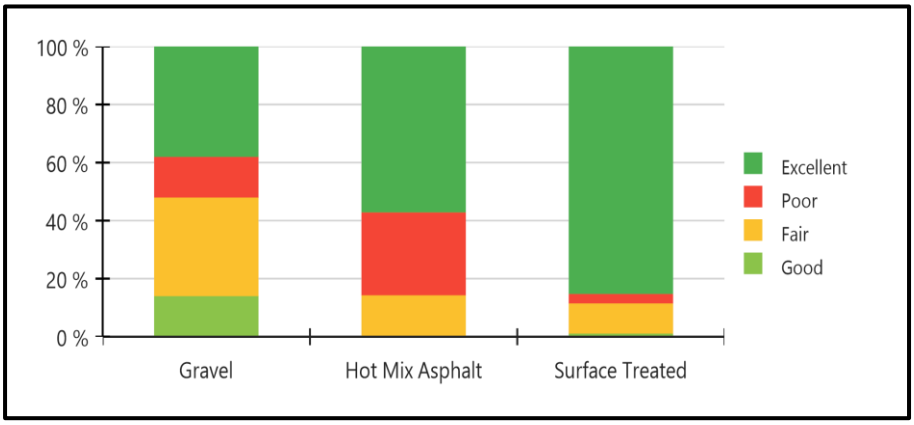



**Figure 9: Road Network Condition by Surface Type**

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

Overall the Road Network is in Good Condition.

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

### 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 Municipality of St.-Charles. The analysis is only focused on the paved road network with a total length of 19.0 km (Asphalt and Surface Treated). In terms of functional class, 100% of the network is local, but more than half of the section are currently undefined. In terms of roadside environment, less than 1% of the network is in an urban and semi-urban environment, 67% are rural and 32% are currently undefined. In terms of surface type, 96% of the paved network is LCB (Surface Treated) and 4% is HCB (high class bituminous). The road network optimization analysis covers the period from 2019 – 2028. The Network Overview dashboard is shown in Figure 10:

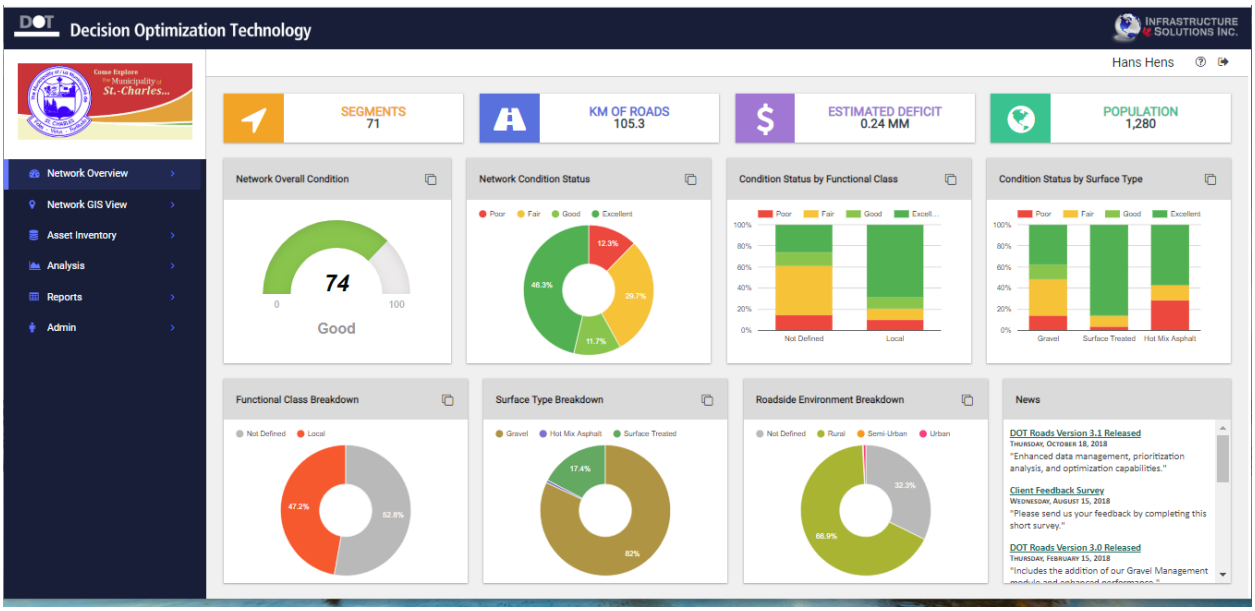



**Figure 10: DOT Roads Network Overview Page**

## 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.

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

**Road Budget Scenarios**

| Year | Scenario 1 | Scenario 2 | Scenario 3 |
|---|---|---|---|
| **2019** | $50,000 | $85,000 | $100,000 |
| **2020** | $50,000 | $85,000 | $100,000 |
| **2021** | $50,000 | $85,000 | $100,000 |
| **2022** | $50,000 | $85,000 | $100,000 |
| **2023** | $50,000 | $85,000 | $100,000 |
| **2024** | $50,000 | $85,000 | $100,000 |
| **2025** | $50,000 | $85,000 | $100,000 |
| **2026** | $50,000 | $85,000 | $100,000 |
| **2027** | $50,000 | $85,000 | $100,000 |
| **2028** | $50,000 | $85,000 | $100,000 |

Scenario 2 is the recommended budget level. It is based on a target analysis which was performed to establish the minimum funding level required to maintain the current performance level of the paved roads at a at about PCI of 72 over the next 10 years. To show the impact of different budget levels on the performance, we included Scenario 1 with a lower annual budget, and Scenario 3 with a higher budget level.

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**

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $49,300 | $49,790 | $49,460 | $49,450 | $46,800 | $48,720 | $49,400 | $45,640 | $47,645 | $49,340 |
| 2 | $83,510 | $81,000 | $81,920 | $80,560 | $83,560 | $84,640 | $79,890 | $83,340 | $81,660 | $83,570 |
| 3 | $97,280 | $97,840 | $96,750 | $96,600 | $98,160 | $99,190 | $81,200 | $97,430 | $97,840 | $99,898 |

Figure 11 shows a comparison between different budget scenarios in terms of network overall performance:

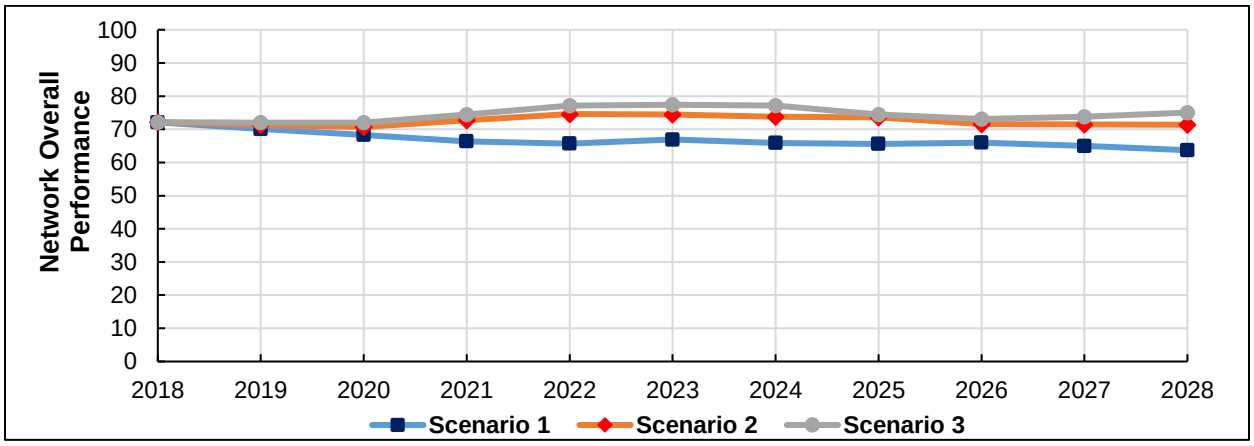


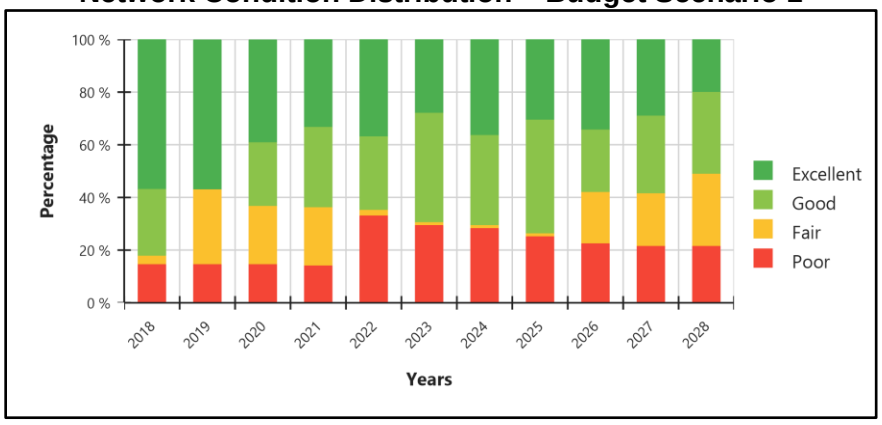

**Figure 11: Scenario Comparison - Overall Network Performance**

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 72.1, with 12.3% of the sections performing in a poor, 29.0% in a fair and 49.0% in an good and excellent condition state. Using the

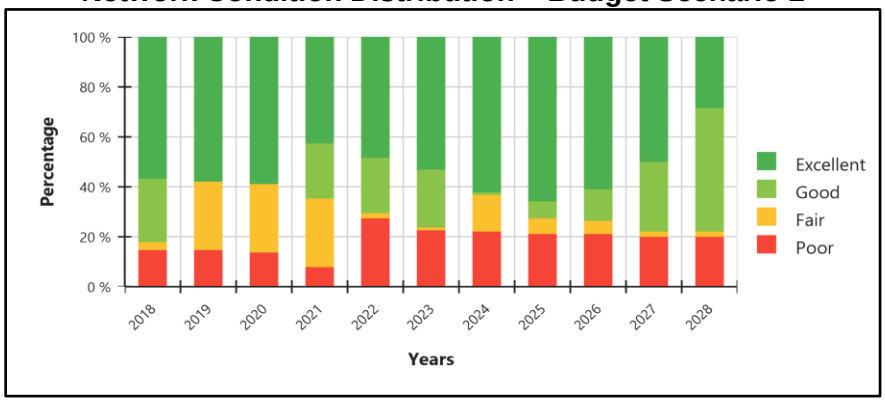
recommended budgeting strategy Scenario 2, over the next 10 years the performance of the network is maintained with a PCI of 71 overall. For the lower budget Scenario 1, the level of performance drops to a PCI of 64, while the higher budget Scenario 3 yields a PCI of 75 at the end of plan.

Figure 12 shows the condition status of the network at each year for each budget scenario:

**Network Condition Distribution – Budget Scenario 1**




**Network Condition Distribution – Budget Scenario 2**




**Network Condition Distribution – Budget Scenario 3**

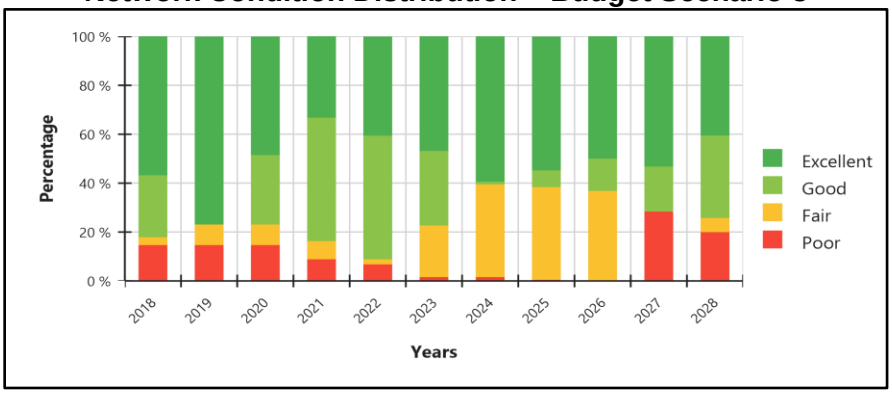



**Figure 12: Scenario Comparison - Annual Network Condition Status**

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.

Paved road infrastructure deficit is estimated at $231,470 in the beginning of the plan. Figure 13 shows the deficit projections for each budget scenario. With the recommended budget Scenario 2 the projected deficit is estimated to be $243,200 at the end of the plan, approximately the same as the current. With Scenario 1, the deficit is estimated at $326,040, a 41% increase, while with Scenario 3 the end of plan deficit is estimated at $243,200, the same as with the recommended budget scenario.

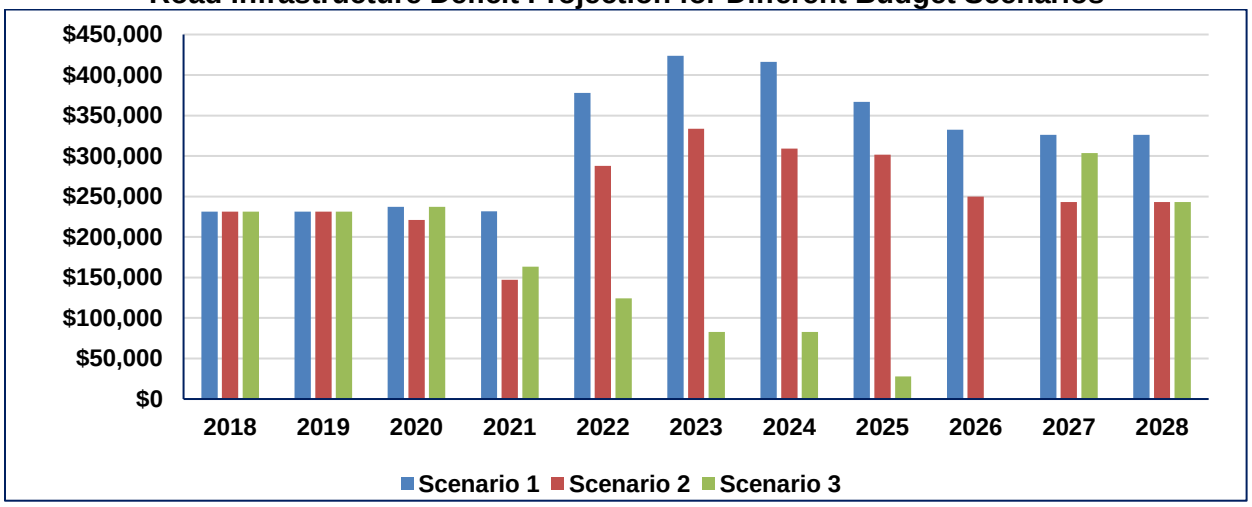



**Figure 13: Road Infrastructure Deficit Projection**

### 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 St.-Charles' 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. However, the DOT Roads software being provided to St.-Charles includes an integrated GRMS (Gravel Road Management System) module which was designed to meet the following criteria:

- manage inventory, condition data, and maintenance history of the gravel roads in conjunction with the paved roads;
- establish refined priority policies using network-wide priority settings based on various physical attributes, such as traffic, functional class, roadside environment, MMS, in addition to socio-economic factors for individual road segments;
- specify detailed routine maintenance polices based on local knowledge or pre-set schedules;

- incorporate robust gravel loss models to allow prediction of the need for and extent of re-graveling operations;
- identify when gravel roads should be upgraded to surface treated;
- compare the longer-term impacts of multiple scenarios with different policy and budget settings; and
- generate a 10-year capital plan with road lists, budgeted costs, annual schedules, and map visualizations.

The setup screen for the Municipality's maintenance policies within the DOT Roads Gravel Management module is shown in Figure 14:

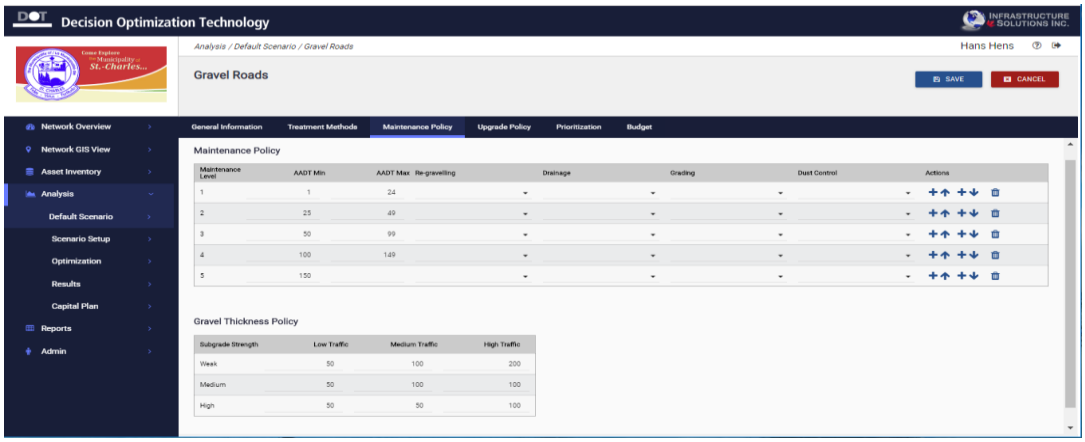



**Figure 14: DOT ROADS Gravel Management Module - Maintenance Policy**

**Decision to Upgrade to Surface Treatment**

A key component of the analysis module of a GRMS is to determine if surface treating (i.e., chip sealing) a gravel road is a sensible option. A financial analysis (i.e., discounted cash flow analysis) can be performed based on the initial cost of upgrading and the cost of subsequent maintenance activities in both cases. Figure 15 shows an example of a financial analysis on two gravel road segments. First segment is 476 m long with AADT of 250 and the other segment is 973 m long with AADT of 50. The analysis uses an inflation rate of 1.5% and a nominal discount rate of 3%. In the first case (AADT of 250), the cost of maintenance as a gravel road (i.e., the cost of re-gravelling, drainage maintenance, grading, and dust control) over the next 20 years in today's dollars is estimated at about $69,000. By surface treating this segment the 20-year maintenance costs are reduced to about $37,000 (i.e., the initial cost of a double chip seal with subsequent slurry seals and single chip seal treatments). It is, therefore, more cost effective to chip seal this segment. In the second case (AADT of 50), however, the cost of maintaining the segment with a gravel surface is around $22,000 less compared to surface treatment.

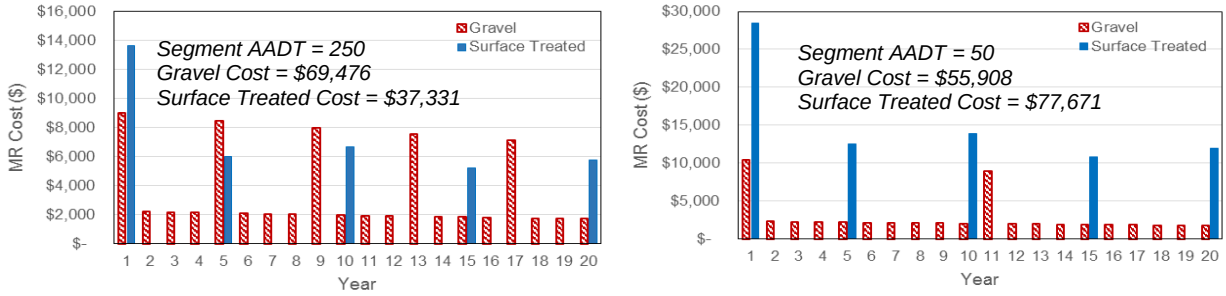



**Figure 15: Financial analysis of upgrading gravel roads to surface treated**

Performing financial analysis indicates that traffic is a major determinant of the time of upgrade for a gravel road. In addition to financial analysis, other considerations that should factor in the decision are described below:

- **Structural Capacity**: When a gravel road is upgraded, the surface treatment acts as a sealant and reduces moisture penetration. It also prevents surface gravel loss, eliminates dust generation, and increases user satisfaction by providing a smoother ride and better appearance. A surface treatment, however, does not improve the structural capacity of a gravel road. A gravel road with structural or subgrade defects, needs to be structurally enhanced or rehabilitated before upgrading to surface treatment. The cost of rehabilitation and stabilization should be added to the initial cost of surface treatment as part of the financial analysis. Upgrading a gravel road with structural defects can significantly reduce the service life of the surface treatment and result in poor performance.
- **Drainage**: Similar to structural capacity, adequate drainage provision of a surface treated road is imperative to achieving satisfactory long-term performance. Surface treated roads are less forgiving to frost damage than gravel surfaces. Poor drainage conditions will reduce the useful life of a surface treatment and make it expensive to maintain.
- **Traffic Characteristics**: Types of traffic can significantly affect the performance of surface treated roads. In some cases, a gravel road can be an agricultural or mining access road that experiences heavy or overloaded trucks on a regular basis. In general, if a gravel road serves heavy traffic, upgrading to surface treated can become an expensive decision since heavy trucks are more damaging to a surface treated road and the cost of rehabilitation is higher. In this case, it may be better to retain the gravel surface and upgrade to a superior load-bearing hot mix asphalt pavement when sufficient funds are available.
- **Road Geometry**: When a gravel road is upgraded to surface treated, it encourages drivers to drive faster and therefore operational speed increases. It may also increase traffic volumes as more motorists decide to use it. Substandard geometric features such as horizontal and vertical alignments, sight distances, lane widths, shoulder widths, superelevations, in addition to lack of signage, can result in safety hazards and a higher risk of accidents. It might be necessary to improve the geometric features of a road before upgrading to surface treatment and the cost of these improvements should be taken into account as part of a financial analysis.
- **Opinions of Local Residents**: While it is usually assumed that local residents will support an upgrade to surface treatment, this is not always the case. Local users may prefer to retain a gravel road rather than encouraging more traffic, higher speeds and greater use of the route by commuters. It should also be noted that from a context sensitivity perspective, gravel surfacing may be more compatible with the road environment and community setting.

## 5.2 SIDEWALKS

This group comprises of:

| | | |
|---|---|---|
| Side - Park | Parks Sidewalk | Asphalt Sidewalks |
| Side 1 | King St East - North Sidewalk Asphalt | |
| Side 6 | Ste Joseph - Notre Dame South | |
| Side 2 | King St East - South Sidewalk | Concrete Sidewalks |
| Side 3 | King St East - North Sidewalk Concrete | |
| Side 4 | King St East - North Sidewalk Extension | |
| Side 7 | Ste Anne Sidewalk | |

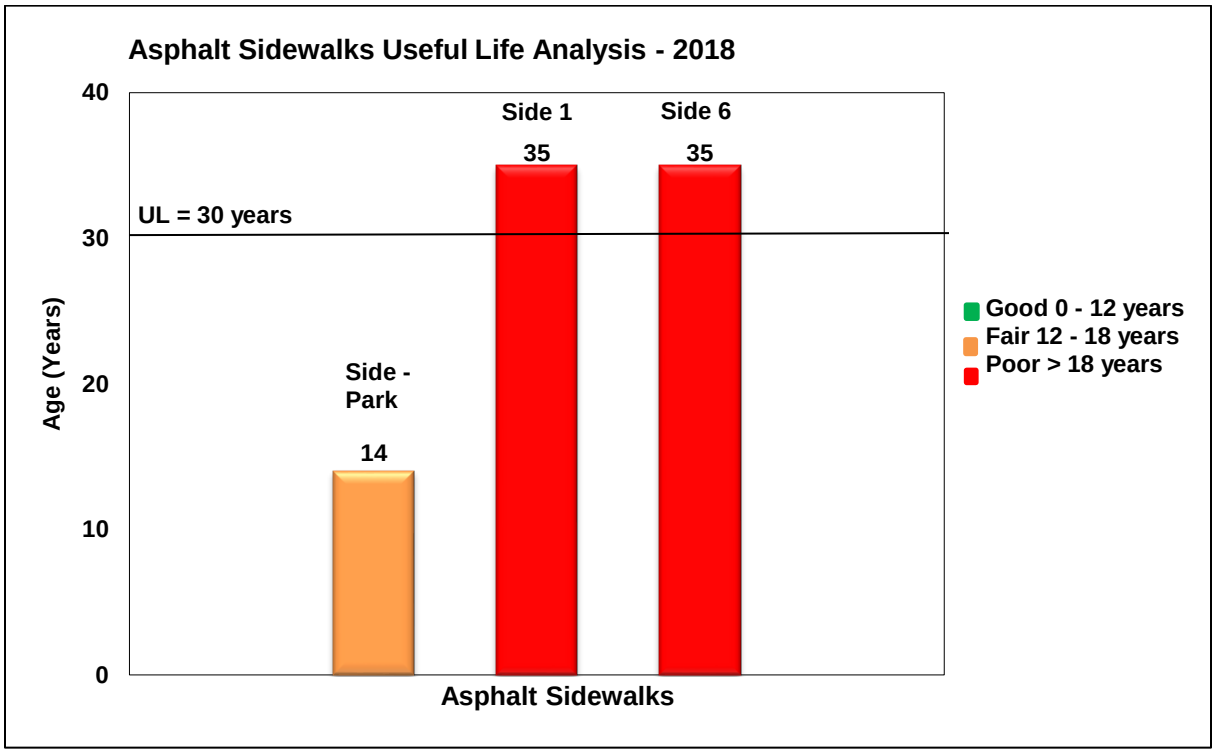



**Figure 16: Asphalt Sidewalks Useful Life**

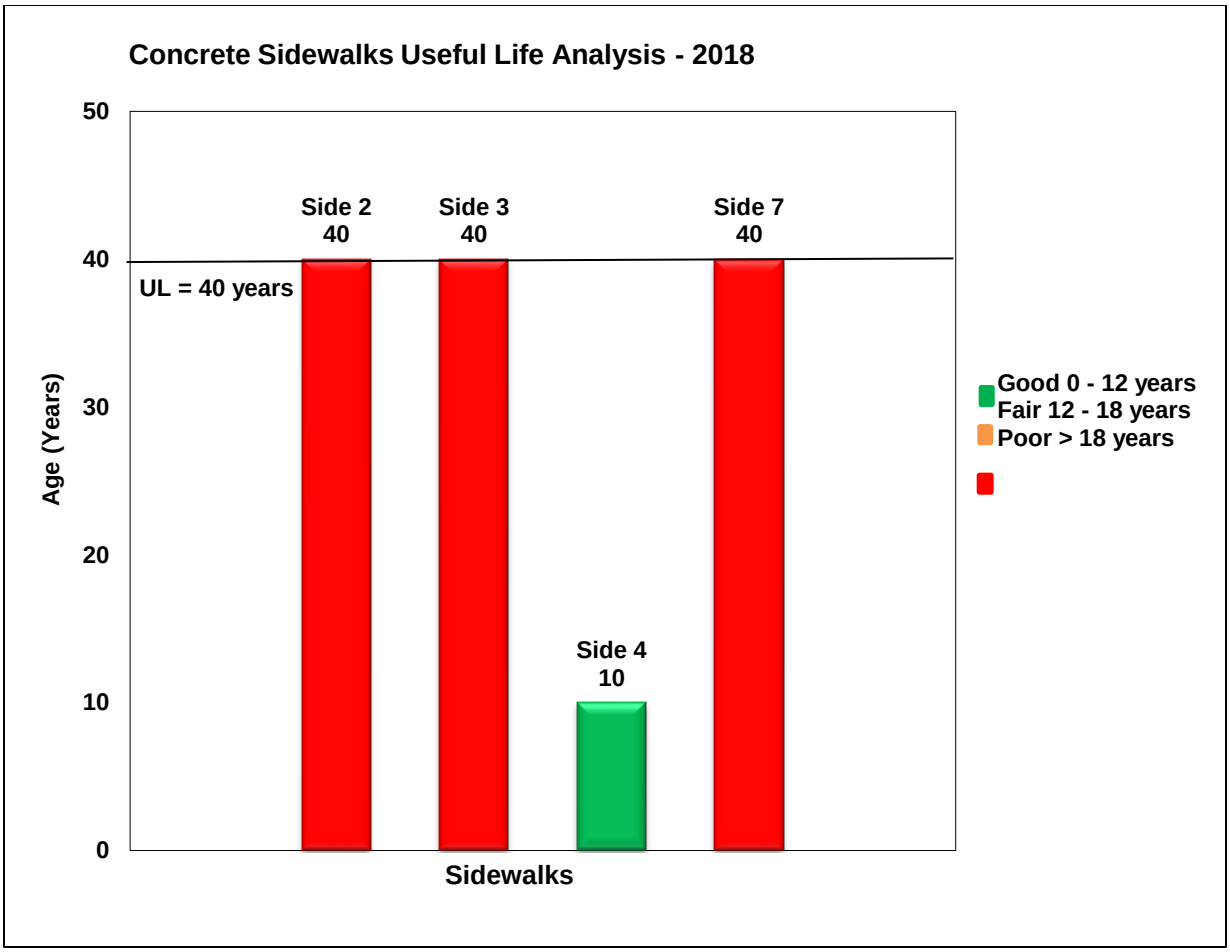



**Figure 17: Concrete Sidewalks Useful Life**

Overall the Sidewalks are in Poor condition.

## 5.3 CULVERTS AND BRIDGE

This category comprises:
- Small Culverts – This group comprises of 8 culverts
- Large (3m+ diameter) Culverts – This group comprises of 11 culverts
- Bridge – There is one bridge

The inspection of the Large Culverts and Bridge was completed in 2018. The culvert inventory is corrugated steel. All the recommended replacements have been included in this report.

The graphs below show the useful life analysis for each asset mentioned above.

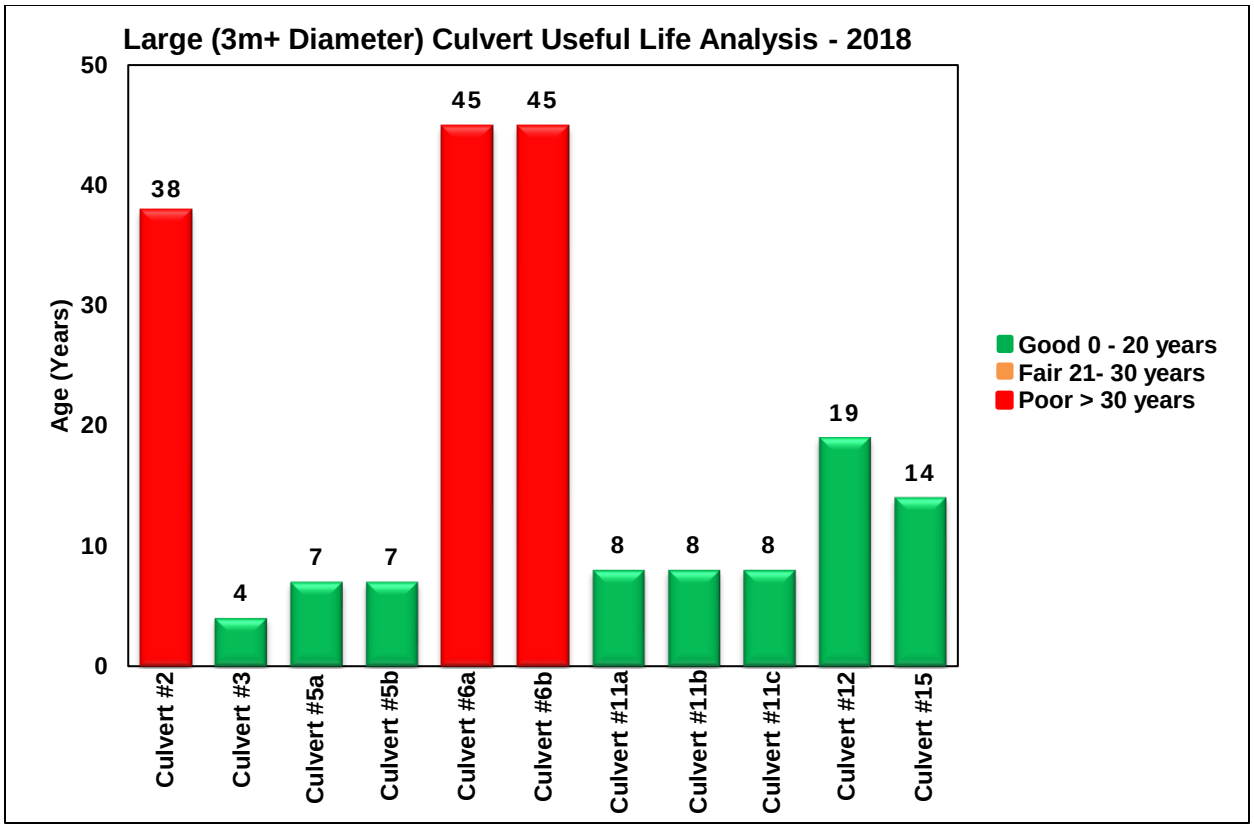



**Figure 18: Large Culverts Useful Life**

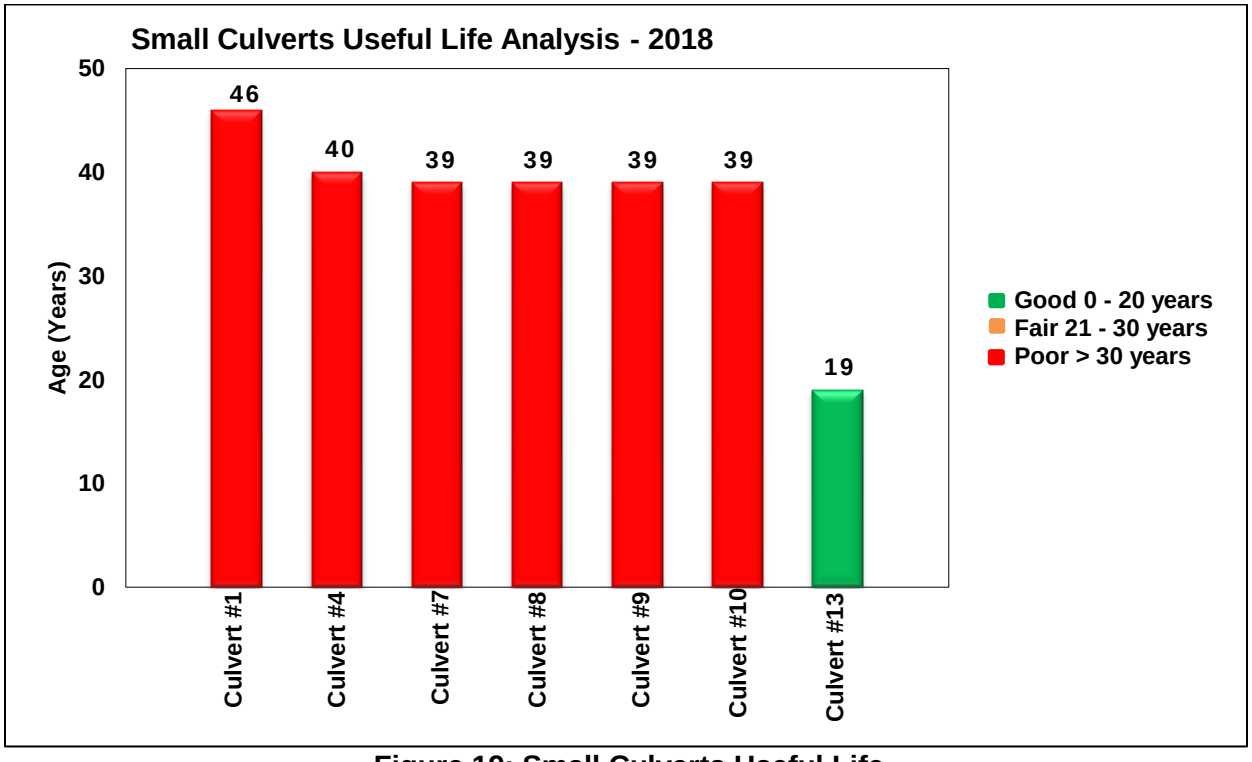



**Figure 19: Small Culverts Useful Life**

The Richer Road bridge is in poor condition. According to the inspection report, while the Bailey superstructure is still in fairly good condition, the substructure, which is constructed of wood cribs and rocks, is failing. The 2018 OSIM inspection report by K. Smart Associates recommends the removal of the superstructure, the reconstruction of the abutments and then re-installation of the bailey superstructure.

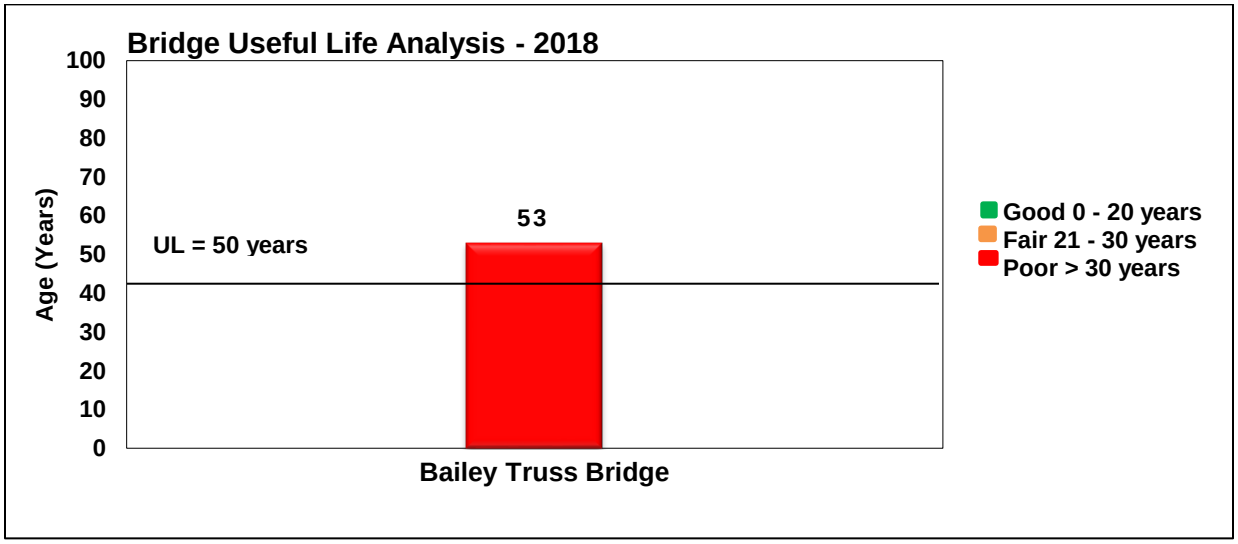



**Figure 20: Bridge Useful Life**

Overall, the Culverts & Bridge are rated in in Fair condition.

## 5.4 WATER SYSTEM

A useful life analysis is used for the Water Treatment System.

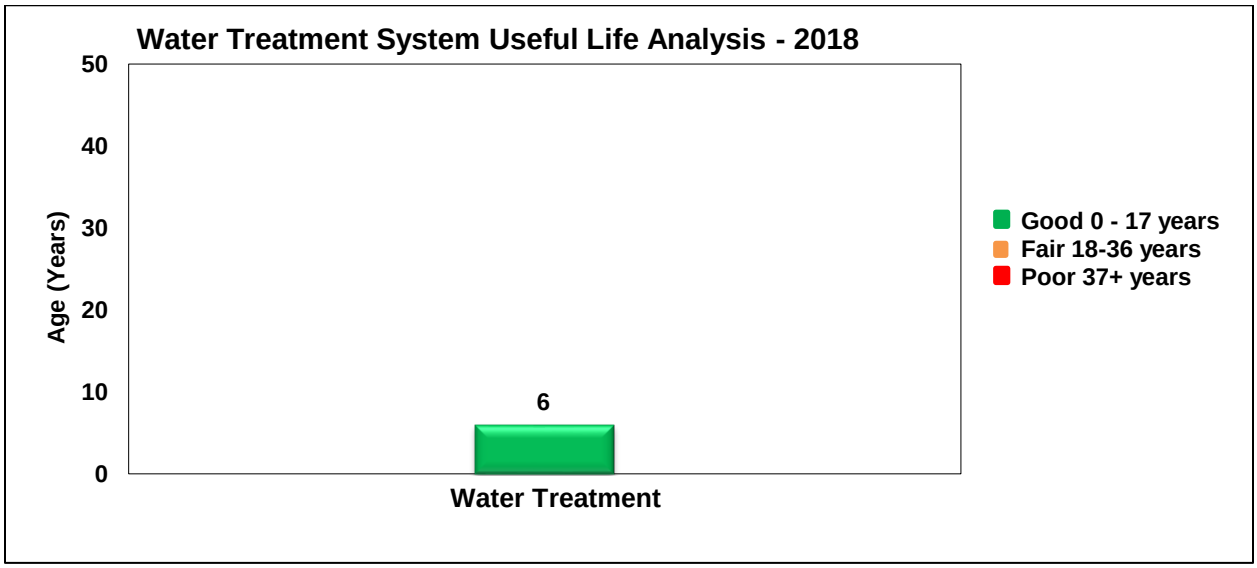



**Figure 21: Water Treatment System Useful Life**

Overall the Water System is in Good condition.

## 5.5 STORM WATER SYSTEM

The Storm Sewer System comprises of 2,770 m Storm Sewerline.

| | |
|---|---|
| 1 - Storm | Casimir Rd Storm Sewers |
| 2 - Storm | King St. East Storm Sewers |
| 3 - Storm | Notre Dame Storm Sewers |
| 4 - Storm | St Joseph Storm Sewers |
| 5 - Storm | St Anne Storm Sewers |
| 6 - Storm | Lapensee St. Storm Sewers |
| 7 - Storm | Hector St. Storm Sewers |
| 8 - Storm | John St. Storm Sewers |

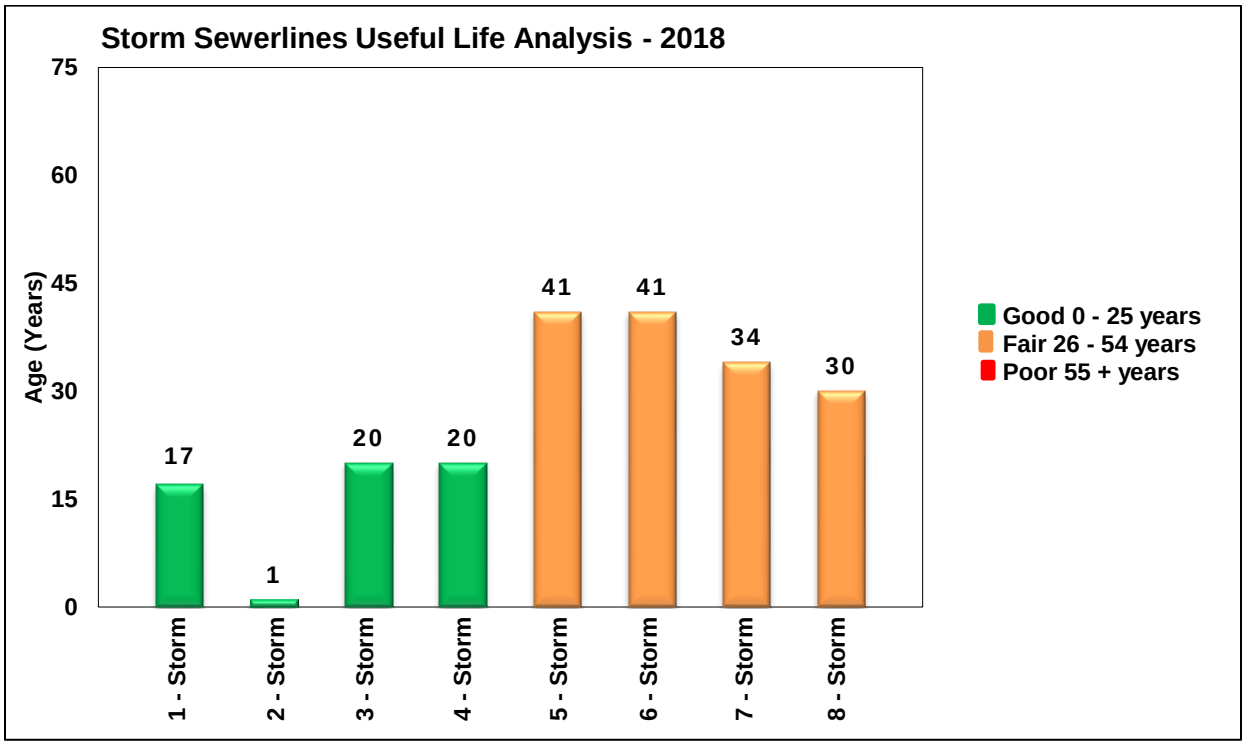



**Figure 22: Storm Sewerlines Useful Life**

Overall the Storm Sewer System is in Good condition.

## 5.6 WASTEWATER SYSTEM

This group comprises of:

- Sewerline Waste Water - consists of total length of 4,525 meters
- Inlet Services
- Lagoon
- Lift Stations (Waste Water)

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.

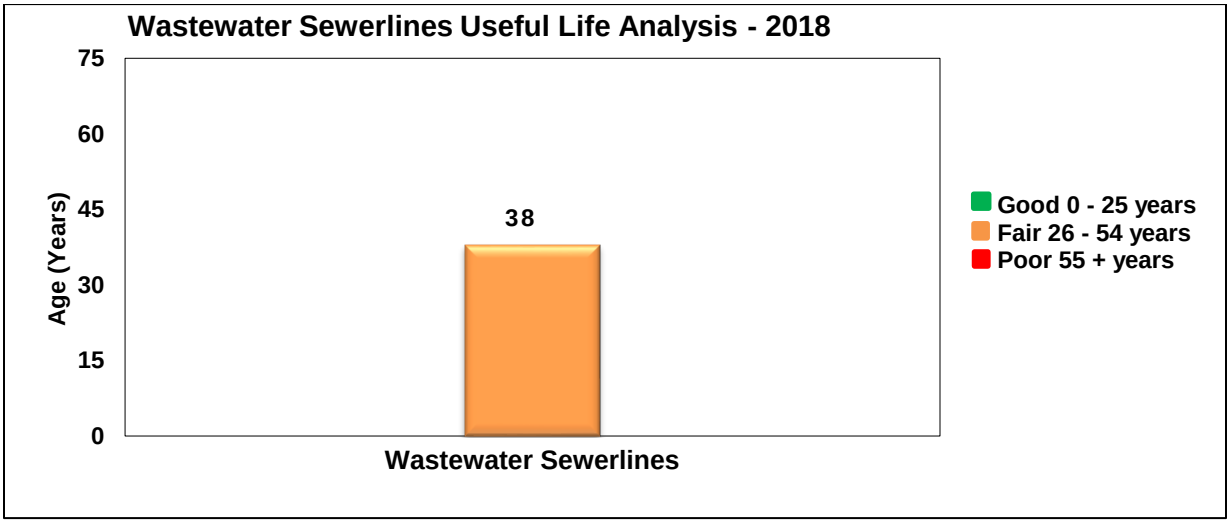



**Figure 23: Wastewater Sewerlines Average Useful Life**

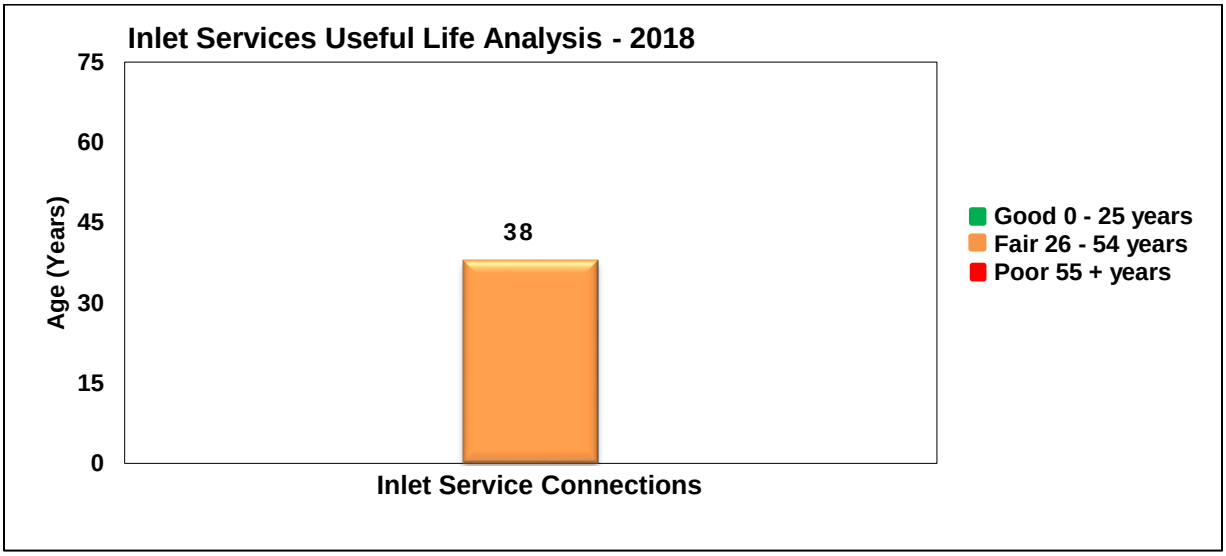



**Figure 24: Inlet Services Average Useful Life**

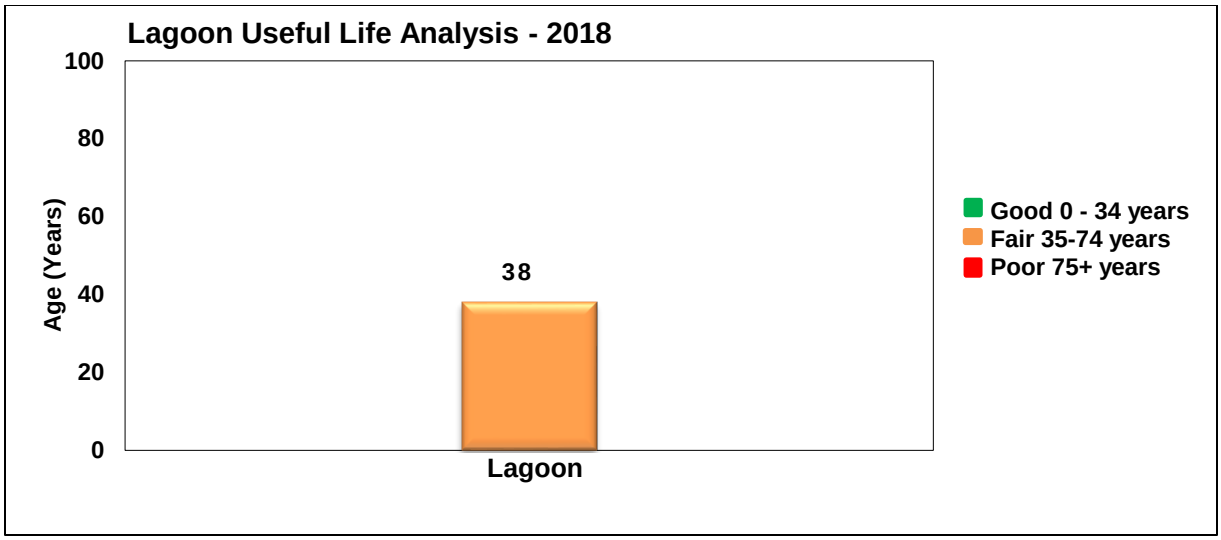



**Figure 25: Lagoon Useful Life**

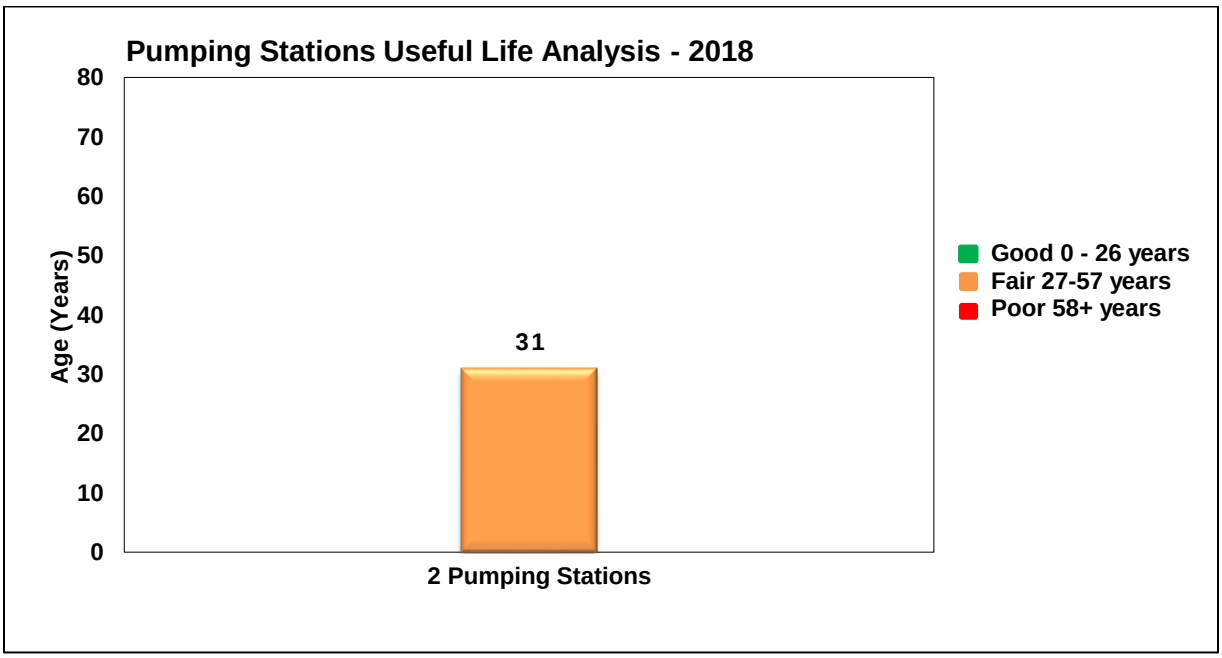



**Figure 26: Pumping Stations Average Useful Life**

Overall the Wastewater System is in Fair condition.

## 5.7 SOTI CONCLUSION

**Linear Asset Condition Rating Report Card**

| Asset Group | Overall Condition Rating | Rating | | Range (Conditions) | Comments |
|---|---|---|---|---|---|
| **Roads** | **A** | A | Good | 65 to 100 | Condition rating based on hybrid condition/age based analysis |
| | | B | Fair | 50 to 64 | |
| | | C | Poor | 0 to 49 | |
| | | | | | |
| **Sidewalks** | **C** | A | Good | Different ranges based upon total useful life for each asset type | Condition rating based on age-based analysis |
| | | B | Fair | | |
| | | C | Poor | | |
| | | | | | |
| **Culverts & Bridge** | **B** | A | Good | Different ranges based upon total useful life for each asset type | Structural Culverts and Bridge condition based, small culverts age-based analysis |
| | | B | Fair | | |
| | | C | Poor | | |
| | | | | | |
| **Water System** | **A** | A | Good | Different ranges based upon total useful life for each asset type | Condition rating based on age-based analysis |
| | | B | Fair | | |
| | | C | Poor | | |
| | | | | | |
| **Storm Water System** | **A** | A | Good | Different ranges based upon total useful life for each asset type | Condition rating based on age-based analysis |
| | | B | Fair | | |
| | | C | Poor | | |
| | | | | | |
| **Wastewater System** | **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 | | |

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 Municipality's linear assets. The Municipality 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 Municipality'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

The Street Lights were purchased in 2016.

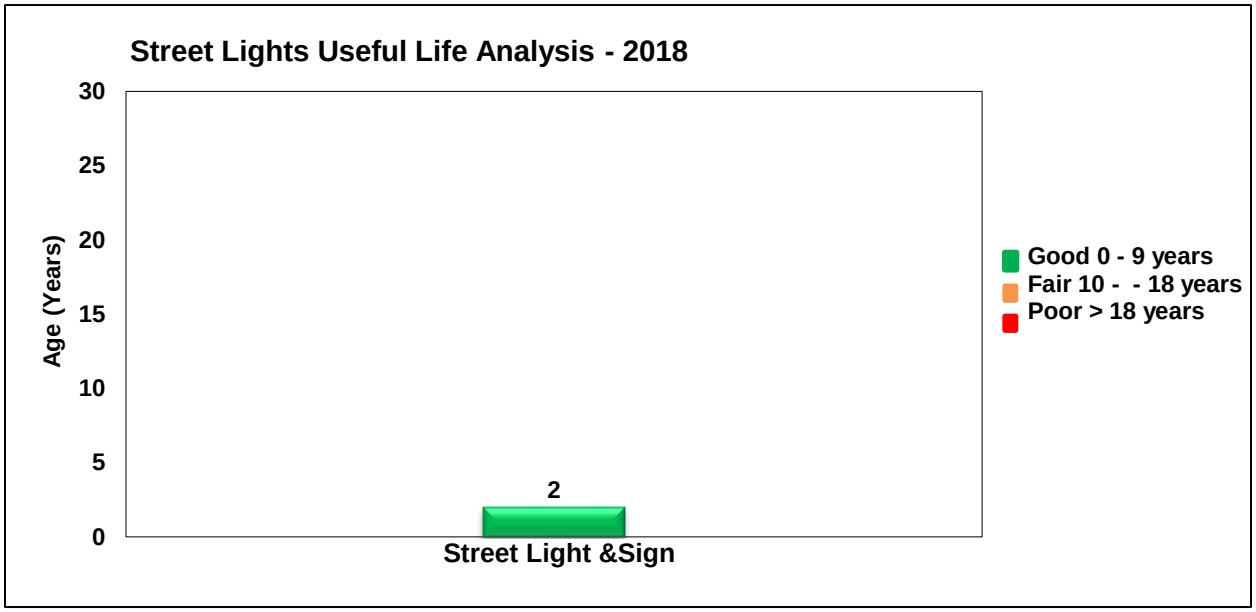



**Figure 27: Street Lights Average Useful Life**

## 6.2 BUILDINGS

This group comprises of buildings like the municipal fire hall, arena, community centre, etc. The replacement cost of the buildings is taken from the insurance document (2018) provided by the Municipality. For the Municipality's buildings, ISI conducted age-based analysis to determine condition assessments to maintain the current portfolio. Building replacement projects based on age triggers are not included in the Infrastructure Deficit and Capital Plan as this would be unrealistic.

However, we were informed by the Municipality that the PW Garage and Arena are in need of major renovations or replacement. As a result, we included the replacement values for these buildings in the 2018 Infrastructure Deficit.

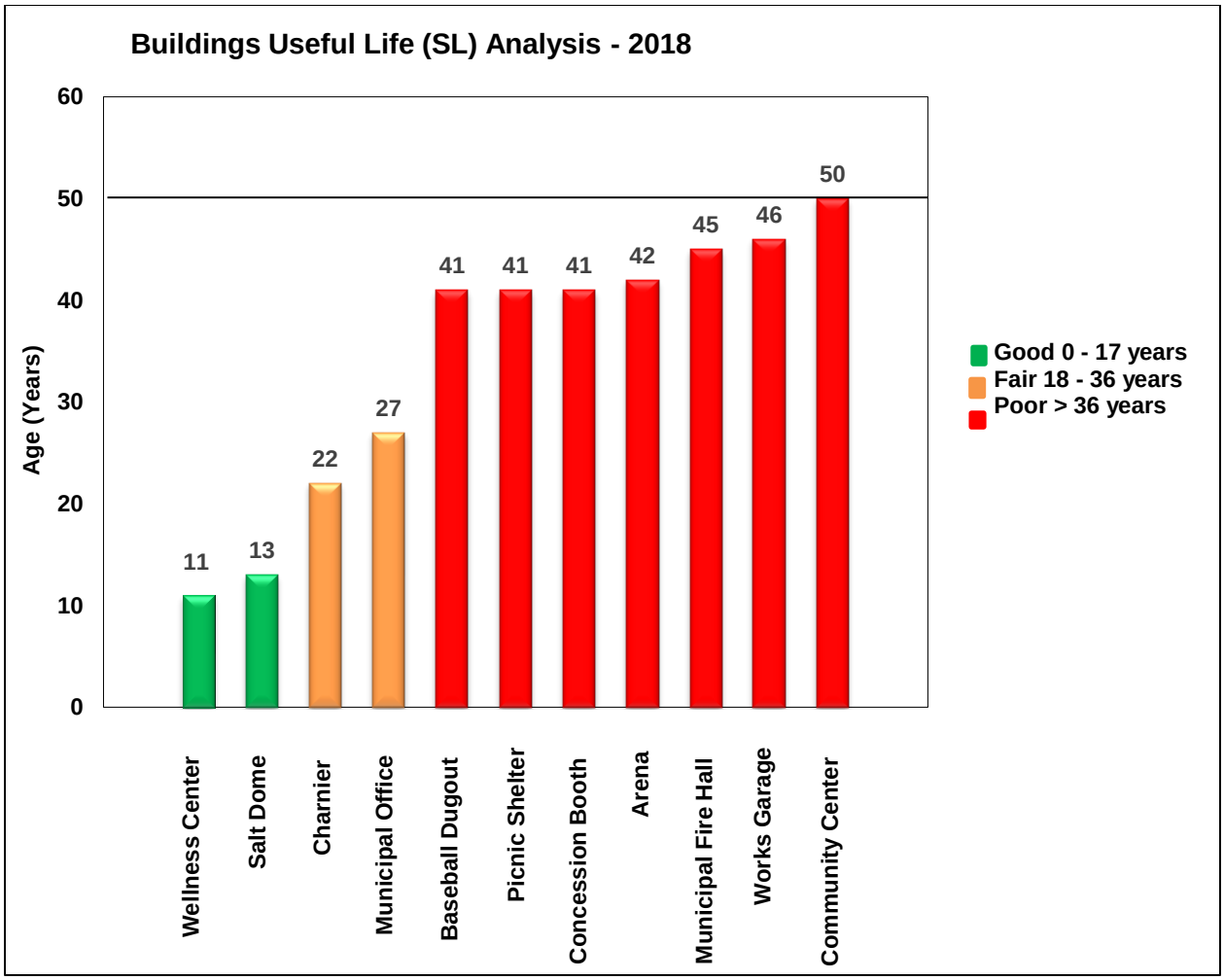



**Figure 28: Buildings Useful Life**

## 6.3 VEHICLES

The vehicle group comprises of pump trucks, a dump truck, a tanker, pickup trucks, etc. The replacement cost is calculated using the Municipality's PSAB report for 2017, 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 Municipality are required to ascertain the accuracy of the Municipality's vehicle requirements.

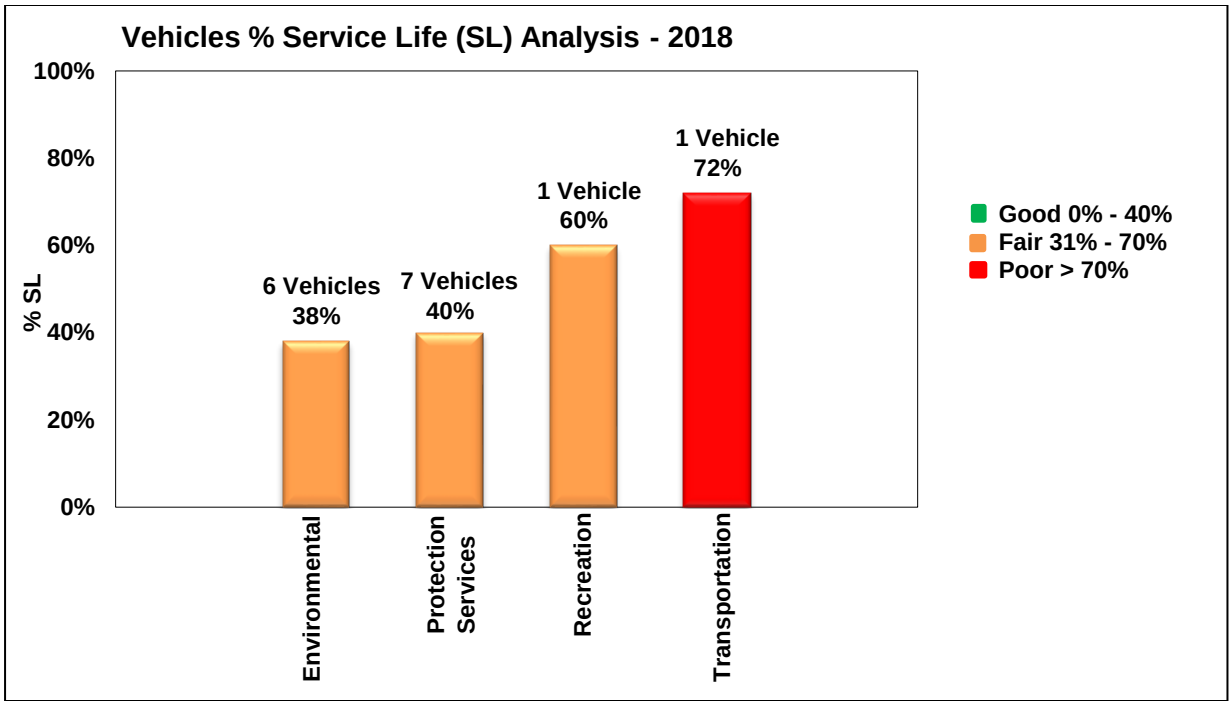



**Figure 29: Vehicles Average % Service Life**

## 6.4 SIGN

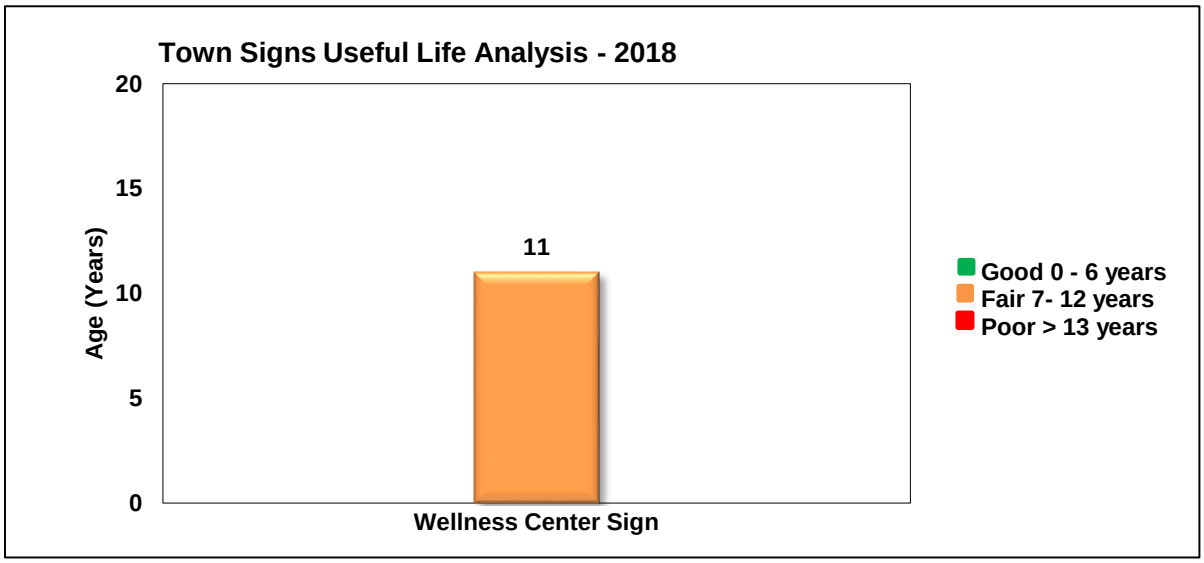



**Figure 30: Sign Useful Life**

## 6.5 RECREATION

This group contains Fitness Equipment, Playgrounds, Ball Fields and the Arena-Ice Plan. In the Tangible Capital Assets (TCA) document, the Fitness Equipment was 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 St.-Charles.

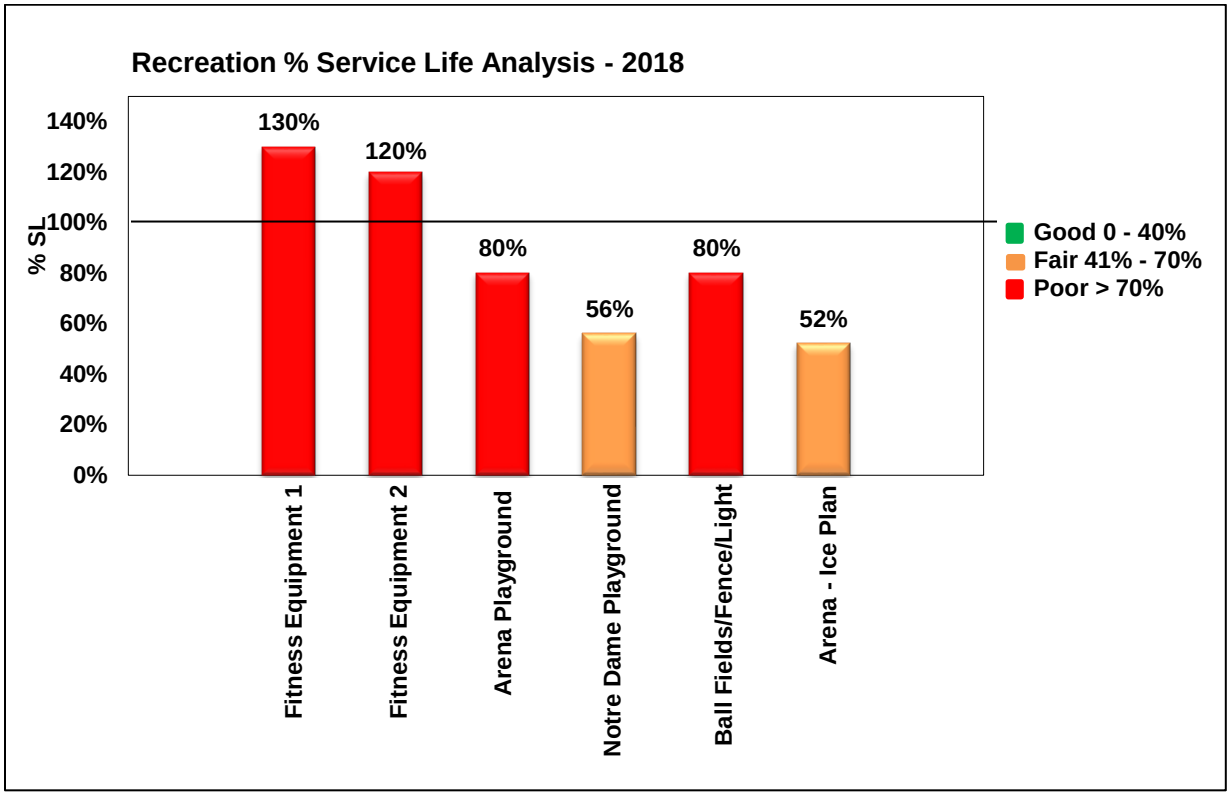



**Figure 31: Recreation Average % Service Life**

## 6.6 EQUIPMENT

This category includes various equipment of different useful life spans. Therefore a %SL (Service Life) analysis was done, with the equipment grouped by department.

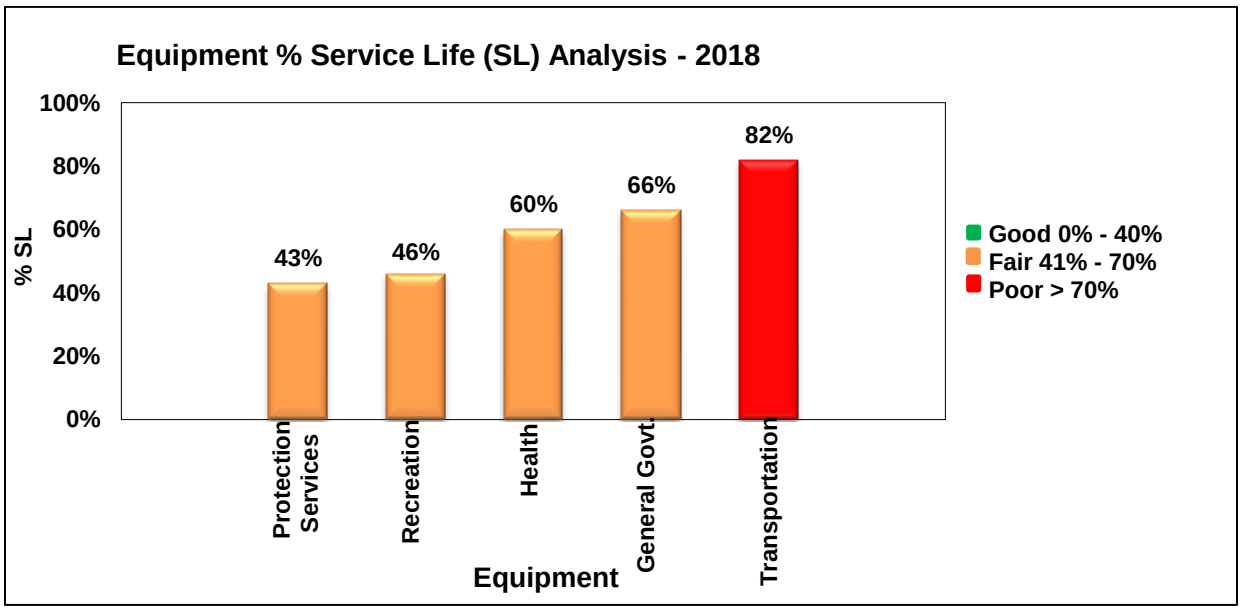



**Figure 32: Equipment Average % Service Life**

# 7 CAPITAL PLAN

## 7.1 BACKGROUND

Managing the Municipality'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 Municipality 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 Municipality of St.-Charles 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 Municipality'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 Municipality 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 Municipality will thus be in a better position to control future debt levels.

## 7.3 METHODOLOGY

The Municipality of St.-Charles' 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 Municipality, 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 Municipality'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 Municipality, 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).
2) Identify the Municipality's current infrastructure deficit.
3) Determine the Municipality'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, St.-Charles 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 2019 to 2029. Inflation will be incorporated in the financial analysis. The results are as follows:

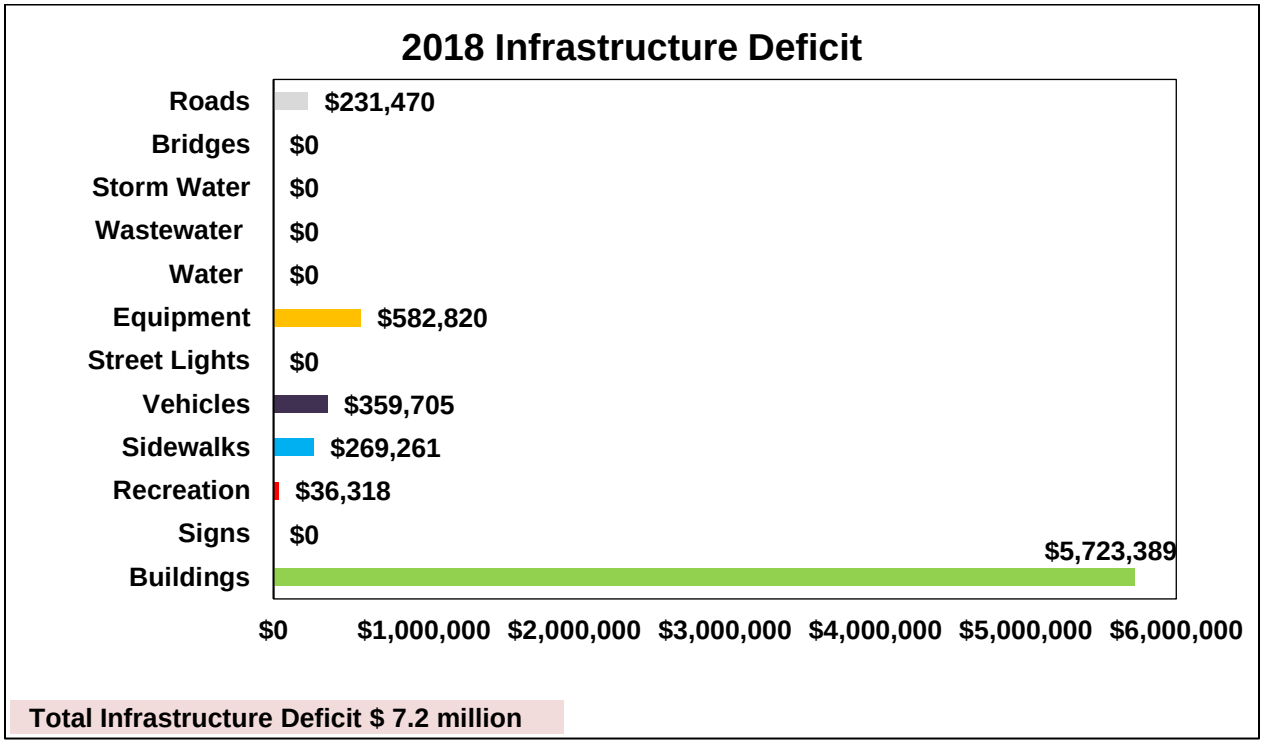



**Figure 33: 2016 Infrastructure Deficit by Asset Category**

The largest amount of the infrastructure deficit are contributed by the buildings. As per the Municipality, the Arena and PW Garage are in need of extensive renovations or replacement, and as a result the replacement values are included here in the Infrastructure Deficit. However, buildings are not included in the Capital Plan. Unless detailed condition data is provided, it would be unreasonable to schedule the buildings for full replacement. The 10-year Capital Plan is summarized below:

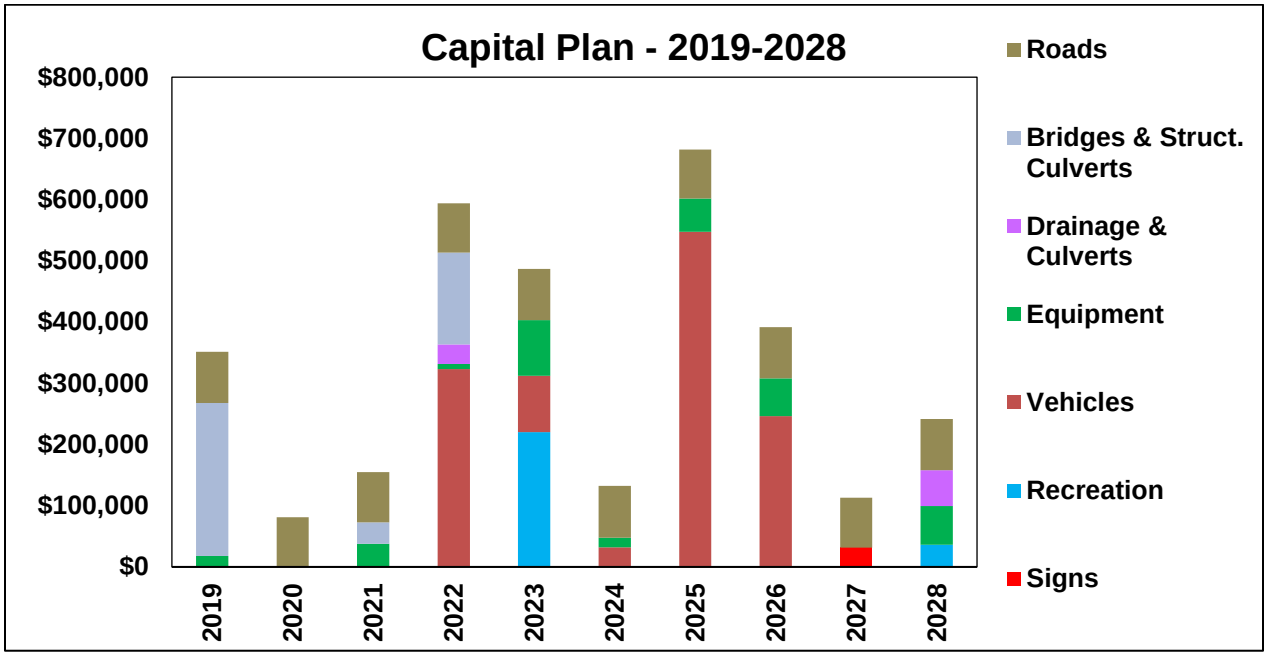



**Figure 34: Summary of Capital Plan 2019-2028**

| Timeframe | Year | Capital Projects (Incl. HST) |
|---|---|---|
| Year 2019-2028 | 2019 | $351,447 |
| | 2020 | $81,000 |
| | 2021 | $154,908 |
| | 2022 | $594,094 |
| | 2023 | $486,592 |
| | 2024 | $132,208 |
| | 2025 | $681,796 |
| | 2026 | $391,516 |
| | 2027 | $112,930 |
| | 2028 | $241,527 |
| **Total** | | **$3,228,019** |

| Timeframe | Year | Bridges & Struct. Culv. | Recreation | Vehicles | Water/WW | Signs | Culverts | Equipment | Roads |
|---|---|---|---|---|---|---|---|---|---|
| Year 2019-2028 | 2019 | $249,787 | $0 | $0 | $0 | $0 | $0 | $18,150 | $83,510 |
| | 2020 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $81,000 |
| | 2021 | $35,000 | $0 | $0 | $0 | $0 | $0 | $37,988 | $81,920 |
| | 2022 | $149,872 | $0 | $323,394 | $0 | $0 | $32,337 | $7,932 | $80,560 |
| | 2023 | $0 | $220,446 | $91,990 | $0 | $0 | $0 | $90,996 | $83,160 |
| | 2024 | $0 | $0 | $32,101 | $0 | $0 | $0 | $15,467 | $84,640 |
| | 2025 | $0 | $0 | $547,205 | $0 | $0 | $0 | $54,701 | $79,890 |
| | 2026 | $0 | $0 | $246,278 | $0 | $0 | $0 | $61,898 | $83,340 |
| | 2027 | $0 | $0 | $0 | $0 | $31,270 | $0 | $0 | $81,660 |
| | 2028 | $0 | $36,318 | $0 | $0 | $0 | $58,315 | $63,325 | $83,570 |

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 Municipality, the Municipality's assets, and the community. They all are interconnected.

There is likely further effort required by the Municipality 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 Municipality, 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 Municipality. 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 Municipality, 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 Municipality'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 Municipality of St.-Charles 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 Municipality 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 Municipality needs to consider developing rating systems to judge the assets from both a Municipality'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 Municipality 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 Municipality. 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 Municipality. | 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 |

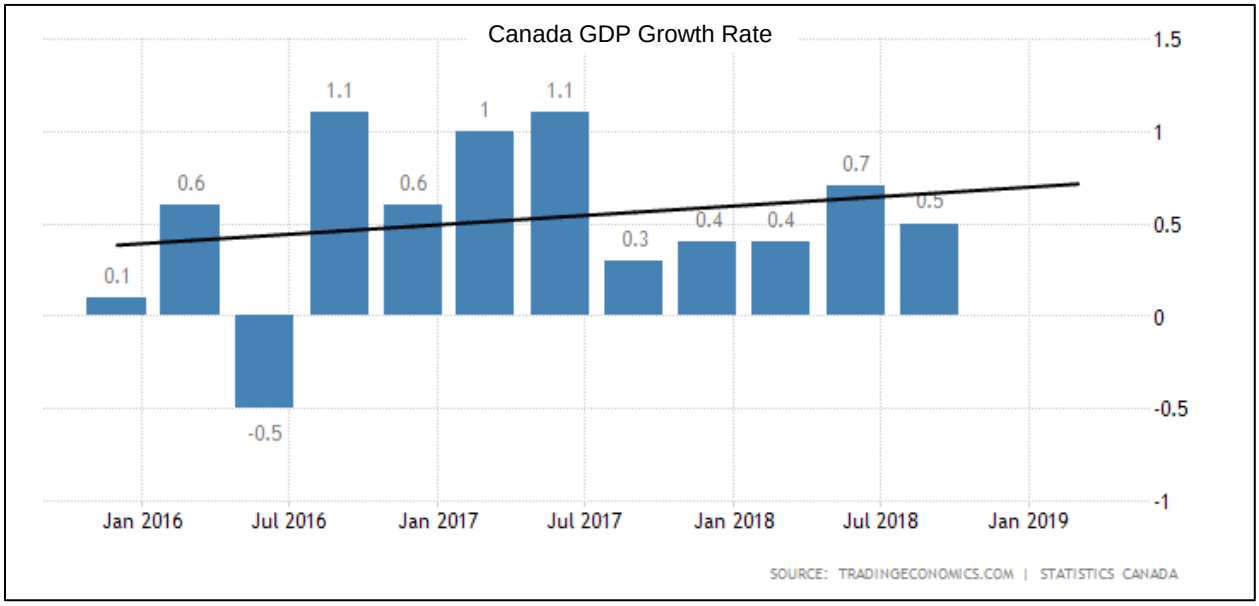
| | | | | |
|---|---|---|---|---|
| **Snow and Ice Control** | Major roads including emergency routes during winter events. | 16 Hours | 16 Hours | Timeline Achieved |
| | Residential areas – through roads first then cul-de-sacs and dead ends. | 16 Hours | 16 Hours | Timeline Achieved |
| | Residential 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 Municipality 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 Municipality 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

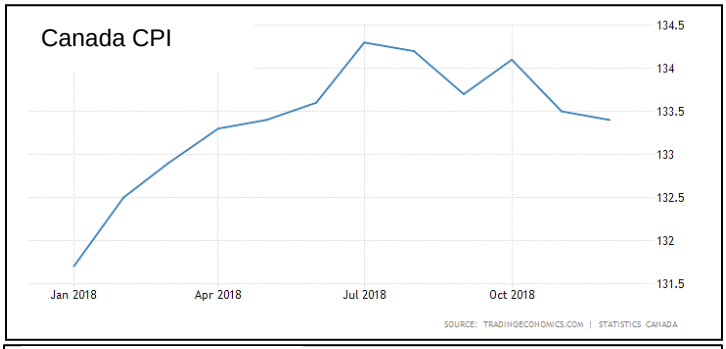
Our first steps in Financial Forecasting include compounding/inflating historical costs to Present Value (2015/16) and then further compounding/inflating these numbers to meet future requirements. To maximize the accuracy of our projections, we have developed a comprehensive "*Municipal Cost Index (MCI)".*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

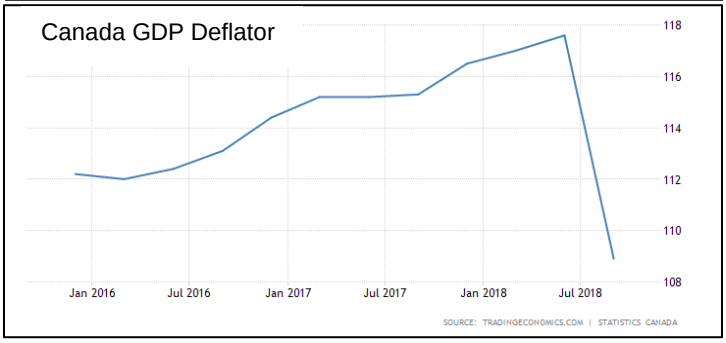
Our basic assumptions and calculations, included within this document, are key to the planning process and serve as the base for the forecasting and predicting your future budgetary requirements and needs.




## 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.




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 (Municipal Cost Index) 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 2018 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

**St.-Charles' 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 as per AMO schedule, extended with no inflation
- Existing funding sources, as identified in the 2017 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 Municipality, 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 Municipality to make an average annual capital investment of $1.08 MM as compared to the current contribution of $199,706. By our calculations, the Municipality would be required to increase property taxes in the range of 7.0% annually. Alternatively, the Municipality would need to be successful in attaining substantial government grants/funding to deal with its infrastructure deficit, an unlikely scenario.

Still, we believe that self-sufficiency should be the Municipality's objective. The Municipality will continue to experience an infrastructure deficit like many other similarly-sized municipalities. By our calculations, the average annual capital requirement without taking the deficit into consideration is $360,183, and the current contribution to the capital program is $199,706. To close this gap, the Municipality would be required to increase property taxes by 3.5% annually (instead of the 2.3% base rate used in our assumptions and calculations) over the 10-year period.

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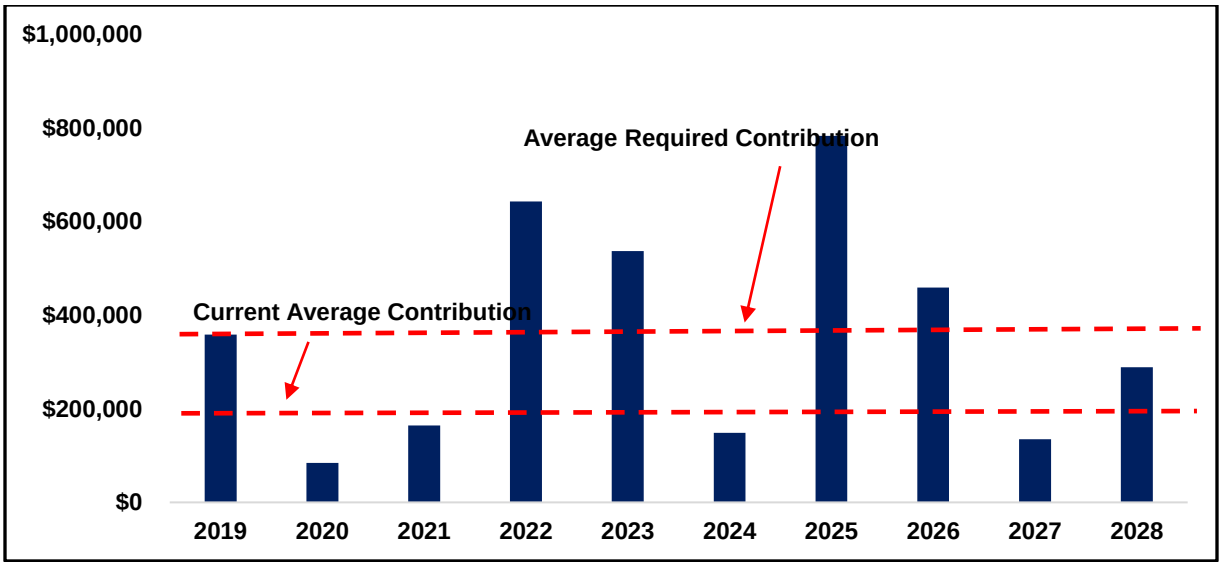



**Figure 35: Capital Program Contributions (Required vs. Existing)**

The funding requirements for the Wastewater network are covered in the 2018 St.-Charles Wastewater Rate Study. On adoption of the Rate Study by Council, the funding requirements will be inserted in the final version of this Asset Management Plan.

# 11 FINANCIAL STRATEGIES – THE INFRASTRUCTURE GAP

Financial sustainability requires that a Municipality ensures that there are sufficient resources to support the delivery of services for which the Municipality bears responsibility. Given the need and benefit for further infrastructure investment in order to protect, sustain, and maximize the use of St.-Charles' 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 Municipality, 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 (not water/wastewater/storm water)**
If the objective is to completely eliminate the infrastructure deficit over 10 years, and without any funding from the Federal or Provincial government, the Municipality would need to implement a 3.5% special infrastructure levy as an infrastructure property tax surcharge. By increasing the levy to 3.5% annually the Municipality will increase the funds available over the 10-year period by approximately $1,776,864. This reflects the significant power of compounding:

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* | |
|---|---|
| 2019 | $ 80,095 |
| 2020 | $ 168,601 |
| 2021 | $ 266,203 |
| 2022 | $ 373,641 |
| 2023 | $ 491,707 |
| 2024 | $ 621,255 |
| 2025 | $ 763,200 |
| 2026 | $ 918,528 |
| 2027 | $ 1,088,295 |
| 2028 | $ 1,273,638 |
| ***Total*** | ***$ 6,045,162*** |
| ***Average increase*** | ***$ 604,516*** |

## 11.2 STRATEGY 2: RETHINKING INFRASTRUCTURE SERVICES

**Optimization**
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 cost analysis (discussed earlier in the report). The DOT (Decision Optimization Technology)™ capital planning software will be instrumental in assisting the Municipality in focusing on preventive maintenance, and optimizing the allocation of the capital budget to determine highest return on investment.

**Service Reduction**
Recognizing the significance of the infrastructure deficit, the Municipality should consider a services review with the objective of re-evaluating the priorities of the community and cost of services provided with the objective of streamlining and potentially eliminating low priority services.

**Long Range Planning**
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.

**Deferred Replacement**
The infrastructure deficit can be viewed as hypothetical in some cases, applying conservative engineering lifecycle calculations that may be overly aggressive in comparison to the real-life experience. For example, you might project the life of a building to be 50 years, but many fully functional buildings are more than 100 years old. Due to the limited funds available, some consideration should be given to where the replacement of some assets may be deferred.

## 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 Municipality 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 Municipality 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 Municipality 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 Municipality (25% of a Municipality'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 Municipality'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 Municipality:

- 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 Municipality will monitor and report on all forms of debt annually.

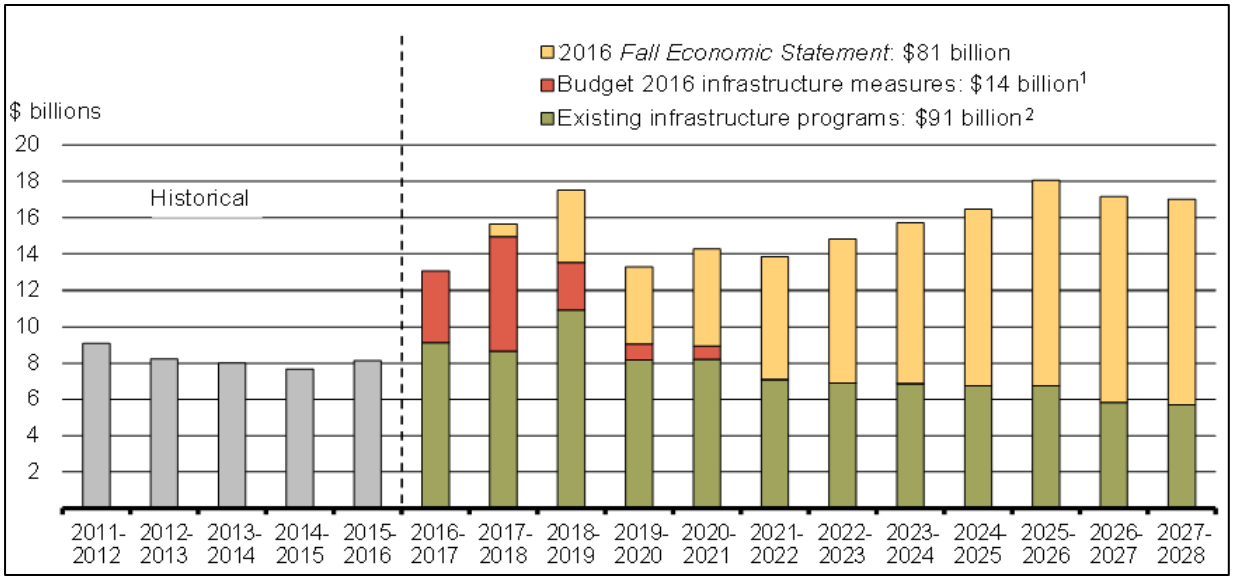
## 11.4 STRATEGY 4: USE OF GRANTS

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 Municipality 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.

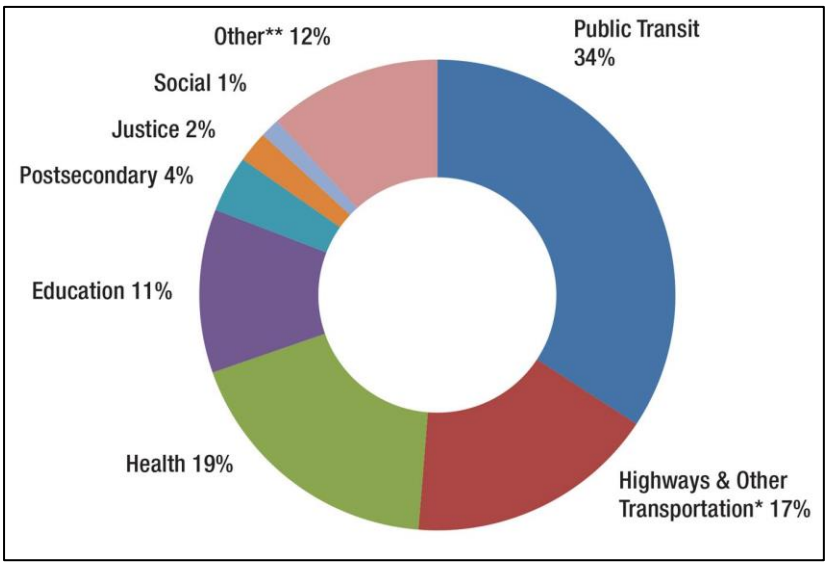



**Figure 37: The Province's 12-year infrastructure plan by sector (%)**

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 38: 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 Municipality needs to build a definitive policy with respect to it's infrastructure deficit.
3. The Municipality of St.-Charles should release its infrastructure policy, strategy and intention as it pertains to the infrastructure deficit, including communications, to the general public in order to gain stakeholder support for tough decisions.
4. The Municipality 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 Municipality 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 Municipality of St.-Charles 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.

1. 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 Municipality 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 Municipality 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 Municipality'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 Municipality 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 Municipality should consider technical performance measurement and monitoring, undertaken by the Municipality 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 Municipality should give due consideration to the following points:

1. The Municipality 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 Municipality has a growing infrastructure deficit which is serious considering its population and tax base. A special infrastructure levy will help the Municipality to reduce the gap over time and should be taken into consideration.
3. In the event that the Municipality implements an infrastructure levy, a percentage of the additional funds should be transferred into a reserve so that the Municipality has some flexibility to prioritize and sustain future infrastructure and service level requirements

and have the ability to match funds with grant programs.

4. The Municipality needs to be proactive in reviewing and capitalizing on the upcoming Provincial and Federal programs, as the Municipality 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 Municipality 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 Municipality needs to embrace the principles of Asset Management to formulate assumptions, projections, and strategies going forward. The Plan should be modified and updated on an ongoing basis.
7. The Municipality 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 Municipality should continue the analysis and examination of key financial goals and strategies that guide future priorities and expenditures.

## 12.5 ONTARIO REGULATION 588/17

While this Asset Management Plan already exceeds current Ontario Asset Management requirements, it does not yet meet all the requirements under the new legislation O. Reg. 88/17.

The timeline for implementing this regulation is as follows:

- **July 1, 2019 -** Each municipality is required to have a Strategic Asset Management Plan in place.
- **July 1, 2021 -** The Asset Management Plan requirements for the CORE municipal infrastructure assets now include a detailed qualitative description and the technical metrics for the Levels of Service for each asset category, including performance measures such as energy usage and operating efficiency. A full lifecycle analysis is to be undertaken for each asset category, analyzing the options for maintaining the current Level of Service including the effects of the risks associated with these options. The consequences of any projected population growth on meeting the Level of Service is also to be considered.
- **July 1, 2023 -** The same requirements are now applied to ALL municipal assets.
- **July 1, 2024 -** A more extensive analysis is required into what Levels of Service are appropriate, the resulting risks to the long-term sustainability of the municipality, the projected funding requirements and the financial strategy.

Meeting these requirements will require additional data on the technical metrics and performance measures, including operational criteria. In addition, the municipality and its stakeholders will need to establish the policies as to the Level of Service for each asset category and any resulting funding requirements and financing strategy.

The Ontario Regulation 588/17 is attached in Appendix D.

# 13 CONCLUSION

The vast majority of smaller Canadian municipalities do not have sufficient tax base to gain control over their infrastructure deficit. Without corrective action over the next 10 years, these communities will see a deterioration in the level of service being offered to its residents. Increased taxes and/or deteriorating levels of services often trigger a migration to larger municipalities, further undermining the smaller community's tax base. Although Provincial and Federal governments are now committing to substantially increased investment in infrastructure, much of it ends up in major urban centers where the greatest number of citizens are served.

At St.-Charles, ISI worked with the CAO, Denis Turcot, who was responsive in providing ISI with information from the Municipality. The information we received was, by in large, accurate and well organized. The overall state of the linear infrastructure at the Municipality is in line with other, similarly sized 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 Municipality's linear assets to require substantial work. The Municipality should continue to be proactive in their strategies, to extend asset useful life and avoid major rehabilitation/reconstruction or replacement costs.

It is highly recommended that the Municipality of St.-Charles embrace the principles of Asset Management. Managing existing infrastructure, doing the right thing, at the right time, involves knowing and implementing 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, significant cross-departmental cooperation, allocating of time, energy, and resource to assume new responsibilities, consultation with the community, and 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).

Through Asset Management, smaller municipalities have the best opportunity to build a strategy for self-sufficiency. A municipal council's first order of business is to capitalize on the significant cost savings and lifecycle gain associated with preventive maintenance. A second initiative would be to use advanced analytical tools to attain the highest possible return, both from a financial and socio-economic perspective, on capital expenditures.

Finally, the Municipality will likely be faced with difficult decisions over the next years, and the infrastructure deficit will continue to widen without corrective action. Only by stakeholder buy-in on a practical and implementable capital plan can communities stem their infrastructure deficit, maintain a quality of life and plot a course for the future with confidence. 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) | 75 | As per the TCA Policy |
| | Sewerline (Waste Water) | 75 | As per the TCA Policy |
| | Lagoon | 100 | As per the TCA Policy |
| | Sewer Structure (Storm)/Ditches | 50 | Infrastructure Report |
| | Lift Station | 80 | As per the TCA Policy |
| | Manhole (Waste Water) | 75 | As per the TCA Policy |
| Water Network | Waterlines | 100 | As per the TCA Policy |
| | Water Treatment System | 500 | As per the TCA Policy |
| | Hydrants | 100 | 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 | 50 | As per the TCA Policy |

| Rating Category | %Service Life (SL) | Definition |
|---|---|---|
| Good | < 40% | 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 | 40% -70% | The infrastructure in the system or network shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies |
| Poor | > 70% | 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 2) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **COMPONENTS** | **Weights** | **Inflators for Each Component** | | | | | | |
| | | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** |
| Wages and Salaries and Benefits | 29% | | 12% | 4% | 7% | 1% | 5% | |
| Interest on Long Term Debt | 0% | | -18% | | | | | |
| Materials | 30% | | 3% | | | 3% | | |
| Contracted Services | 28% | | | 16% | | | | |
| Rents and Financial Expenses | 0% | | 6% | 15% | | | | |
| External Transfers | 3% | | 4% | 11% | | | -3% | |
| Amortization | 10% | | | | | 7% | 11% | |
| **Average MCI** | **3.64%** | | | | | | | |

**Notes:**

- Municipal Cost Index**,** is calculated to better represent the municipal purchasing power and cost experience, so ISI will use 3.64% as the compounding/inflationary factor up until 2018
- 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

# APPENDIX D - ONTARIO REGULATION 588/17

## ONTARIO REGULATION 588/17

made under the

## INFRASTRUCTURE FOR JOBS AND PROSPERITY ACT, 2015

Made: December 13, 2017
Filed: December 27, 2017
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## ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE

### CONTENTS



### INTERPRETATION AND APPLICATION

**Definitions**

**1.** (1) In this Regulation,

"asset category" means a category of municipal infrastructure assets that is,

(a) an aggregate of assets described in each of clauses (a) to (e) of the definition of core municipal infrastructure asset, or

(b) composed of any other aggregate of municipal infrastructure assets that provide the same type of service; ("catégorie de biens")

"core municipal infrastructure asset" means any municipal infrastructure asset that is a,

(a) water asset that relates to the collection, production, treatment, storage, supply or distribution of water,

(b) wastewater asset that relates to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater,

(c) stormwater management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater,

(d) road, or

(e) bridge or culvert; ("bien d'infrastructure municipale essentiel")

"ecological functions" has the same meaning as in Ontario Regulation 140/02 (Oak Ridges Moraine Conservation Plan) made under the *Oak Ridges Moraine Conservation Act, 2001*; ("fonctions écologiques")

"green infrastructure asset" means an infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs; ("bien d'infrastructure verte")

"hydrological functions" has the same meaning as in Ontario Regulation 140/02; ("fonctions hydrologiques")

"joint municipal water board" means a joint board established in accordance with a transfer order made under the *Municipal Water and Sewage Transfer Act, 1997*; ("conseil mixte de gestion municipale des eaux")

"lifecycle activities" means activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities; ("activités relatives au cycle de vie")

"municipal infrastructure asset" means an infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board; ("bien d'infrastructure municipale")

"municipality" has the same meaning as in the *Municipal Act, 2001*; ("municipalité")

"operating costs" means the aggregate of costs, including energy costs, of operating a municipal infrastructure asset over its service life; ("frais d'exploitation")

"service life" means the total period during which a municipal infrastructure asset is in use or is available to be used; ("durée de vie")

"significant operating costs" means, where the operating costs with respect to all municipal infrastructure assets within an asset category are in excess of a threshold amount set by the municipality, the total amount of those operating costs. ("frais d'exploitation importants")

(2) In Tables 1 and 2,

"connection-days" means the number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue. ("jours-branchements")

(3) In Table 4,

"arterial roads" means Class 1 and Class 2 highways as determined under the Table to section 1 of Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) made under the *Municipal Act, 2001*; ("artères")

"collector roads" means Class 3 and Class 4 highways as determined under the Table to section 1 of Ontario Regulation 239/02; ("routes collectrices")

"lane-kilometre" means a kilometre-long segment of roadway that is a single lane in width; ("kilomètre de voie")

"local roads" means Class 5 and Class 6 highways as determined under the Table to section 1 of Ontario Regulation 239/02. ("routes locales")

(4) In Table 5,

"Ontario Structure Inspection Manual" means the Ontario Structure Inspection Manual (OSIM), published by the Ministry of Transportation and dated October 2000 (revised November 2003 and April 2008) and available on a Government of Ontario website; ("manuel d'inspection des structures de l'Ontario")

"structural culvert" has the meaning set out for "culvert (structural)" in the Ontario Structure Inspection Manual. ("ponceau structurel")

**Application**

**2.** For the purposes of section 6 of the Act, every municipality is prescribed as a broader public sector entity to which that section applies.

## STRATEGIC ASSET MANAGEMENT POLICIES

**Strategic asset management policy**

**3.** (1) Every municipality shall prepare a strategic asset management policy that includes the following:

1. Any of the municipality's goals, policies or plans that are supported by its asset management plan.
2. The process by which the asset management plan is to be considered in the development of the municipality's budget or of any long-term financial plans of the municipality that take into account municipal infrastructure assets.
3. The municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning.
4. The principles to be followed by the municipality in its asset management planning, which must include the principles set out in section 3 of the Act.
5. The municipality's commitment to consider, as part of its asset management planning,
    i. the actions that may be required to address the vulnerabilities that may be caused by climate change to the municipality's infrastructure assets, in respect of such matters as,
        A. operations, such as increased maintenance schedules,
        B. levels of service, and
        C. lifecycle management,
    ii. the anticipated costs that could arise from the vulnerabilities described in subparagraph i,
    iii. adaptation opportunities that may be undertaken to manage the vulnerabilities described in subparagraph i,
    iv. mitigation approaches to climate change, such as greenhouse gas emission reduction goals and targets, and
    v. disaster planning and contingency funding.
6. A process to ensure that the municipality's asset management planning is aligned with any of the following financial plans:
    i. Financial plans related to the municipality's water assets including any financial plans prepared under the *Safe Drinking Water Act, 2002*.
    ii. Financial plans related to the municipality's wastewater assets.
7. A process to ensure that the municipality's asset management planning is aligned with Ontario's land-use planning framework, including any relevant policy statements issued under subsection 3 (1) of the *Planning Act*, any provincial plans as defined in the *Planning Act* and the municipality's official plan.
8. An explanation of the capitalization thresholds used to determine which assets are to be included in the municipality's asset management plan and how the thresholds compare to those in the municipality's tangible capital asset policy, if it has one.
9. The municipality's commitment to coordinate planning for asset management, where municipal infrastructure assets connect or are interrelated with those of its upper-tier municipality, neighbouring municipalities or jointly-owned municipal bodies.
10. The persons responsible for the municipality's asset management planning, including the executive lead.
11. An explanation of the municipal council's involvement in the municipality's asset management planning.
12. The municipality's commitment to provide opportunities for municipal residents and other interested parties to provide input into the municipality's asset management planning.

(2) For the purposes of this section,

"capitalization threshold" is the value of a municipal infrastructure asset at or above which a municipality will capitalize the value of it and below which it will expense the value of it. ("seuil de capitalisation")

**Update of asset management policy**

**4.** Every municipality shall prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five years.

## ASSET MANAGEMENT PLANS

**Asset management plans, current levels of service**

**5.** (1) Every municipality shall prepare an asset management plan in respect of its core municipal infrastructure assets by July 1, 2021, and in respect of all of its other municipal infrastructure assets by July 1, 2023.

(2) A municipality's asset management plan must include the following:

1. For each asset category, the current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at most the two calendar years prior to the year in which all information required under this section is included in the asset management plan:
    i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
    ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency, and based on data from at most two calendar years prior to the year in which all information required under this section is included in the asset management plan.
3. For each asset category,
    i. a summary of the assets in the category,
    ii. the replacement cost of the assets in the category,
    iii. the average age of the assets in the category, determined by assessing the average age of the components of the assets,
    iv. the information available on the condition of the assets in the category, and
    v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.
4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:
    i. The full lifecycle of the assets.
    ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.
    iii. The risks associated with the options referred to in subparagraph ii.
    iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service.
5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, the following:
    i. A description of assumptions regarding future changes in population or economic activity.
    ii. How the assumptions referred to in subparagraph i relate to the information required by paragraph 4.
6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census, the following:
    i. With respect to municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are set out in Schedule 3 or 7 to the 2017 Growth Plan, those forecasts.
    ii. With respect to lower-tier municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are not set out in Schedule 7 to the 2017 Growth Plan, the portion of the forecasts allocated to the lower-tier municipality in the official plan of the upper-tier municipality of which it is a part.
    iii. With respect to upper-tier municipalities or single-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the municipality that are set out in its official plan.

iv. With respect to lower-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the lower-tier municipality that are set out in the official plan of the upper-tier municipality of which it is a part.

v. If, with respect to any municipality referred to in subparagraph iii or iv, the population and employment forecasts for the municipality cannot be determined as set out in those subparagraphs, a description of assumptions regarding future changes in population or economic activity.

vi. For each of the 10 years following the year for which the current levels of service under paragraph 1 are determined, the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets.

(3) Every asset management plan must indicate how all background information and reports upon which the information required by paragraph 3 of subsection (2) is based will be made available to the public.

(4) In this section,

"2017 Growth Plan" means the Growth Plan for the Greater Golden Horseshoe, 2017 that was approved under subsection 7 (6) of the *Places to Grow Act, 2005* on May 16, 2017 and came into effect on July 1, 2017; ("Plan de croissance de 2017")

"Greater Golden Horseshoe growth plan area" means the area designated by section 2 of Ontario Regulation 416/05 (Growth Plan Areas) made under the *Places to Grow Act, 2005*. ("zone de croissance planifiée de la région élargie du Golden Horseshoe")

**Asset management plans, proposed levels of service**

**6.** (1) Subject to subsection (2), by July 1, 2024, every asset management plan prepared under section 5 must include the following additional information:

1. For each asset category, the levels of service that the municipality proposes to provide for each of the 10 years following the year in which all information required under section 5 and this section is included in the asset management plan, determined in accordance with the following qualitative descriptions and technical metrics:
   i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
   ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. An explanation of why the proposed levels of service under paragraph 1 are appropriate for the municipality, based on an assessment of the following:
   i. The options for the proposed levels of service and the risks associated with those options to the long term sustainability of the municipality.
   ii. How the proposed levels of service differ from the current levels of service set out under paragraph 1 of subsection 5 (2).
   iii. Whether the proposed levels of service are achievable.
   iv. The municipality's ability to afford the proposed levels of service.
3. The proposed performance of each asset category for each year of the 10-year period referred to in paragraph 1, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency.
4. A lifecycle management and financial strategy that sets out the following information with respect to the assets in each asset category for the 10-year period referred to in paragraph 1:
   i. An identification of the lifecycle activities that would need to be undertaken to provide the proposed levels of service described in paragraph 1, based on an assessment of the following:
      A. The full lifecycle of the assets.
      B. The options for which lifecycle activities could potentially be undertaken to achieve the proposed levels of service.
      C. The risks associated with the options referred to in sub-subparagraph B.

D. The lifecycle activities referred to in sub-subparagraph B that can be undertaken for the lowest cost to achieve the proposed levels of service.

ii. An estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities identified in subparagraph i, separated into capital expenditures and significant operating costs.

iii. An identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.

iv. If, based on the funding projected to be available, the municipality identifies a funding shortfall for the lifecycle activities identified in subparagraph i,

A. an identification of the lifecycle activities, whether set out in subparagraph i or otherwise, that the municipality will undertake, and

B. if applicable, an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities identified in subparagraph i.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, a discussion of how the assumptions regarding future changes in population and economic activity, set out in subparagraph 5 i of subsection 5 (2), informed the preparation of the lifecycle management and financial strategy referred to in paragraph 4 of this subsection.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census,

i. the estimated capital expenditures and significant operating costs to achieve the proposed levels of service as described in paragraph 1 in order to accommodate projected increases in demand caused by population and employment growth, as set out in the forecasts or assumptions referred to in paragraph 6 of subsection 5 (2), including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets,

ii. the funding projected to be available, by source, as a result of increased population and economic activity, and

iii. an overview of the risks associated with implementation of the asset management plan and any actions that would be proposed in response to those risks.

7. An explanation of any other key assumptions underlying the plan that have not previously been explained.

(2) With respect to an asset management plan prepared under section 5 on or before July 1, 2021, if the additional information required under this section is not included before July 1, 2023, the municipality shall, before including the additional information, update the current levels of service set out under paragraph 1 of subsection 5 (2) and the current performance measures set out under paragraph 2 of subsection 5 (2) based on data from the two most recent calendar years.

**Update of asset management plans**

**7.** (1) Every municipality shall review and update its asset management plan at least five years after the year in which the plan is completed under section 6 and at least every five years thereafter.

(2) The updated asset management plan must comply with the requirements set out under paragraphs 1, 2 and 3 and subparagraphs 5 i and 6 i, ii, iii, iv and v of subsection 5 (2), subsection 5 (3) and paragraphs 1 to 7 of subsection 6 (1).

**Endorsement and approval required**

**8.** Every asset management plan prepared under section 5 or 6, or updated under section 7, must be,

(a) endorsed by the executive lead of the municipality; and

(b) approved by a resolution passed by the municipal council.

**Annual review of asset management planning progress**

**9.** (1) Every municipal council shall conduct an annual review of its asset management progress on or before July 1 in each year, starting the year after the municipality's asset management plan is completed under section 6.

(2) The annual review must address,

(a) the municipality's progress in implementing its asset management plan;

(b) any factors impeding the municipality's ability to implement its asset management plan; and

(c) a strategy to address the factors described in clause (b).

**Public availability**

**10.** Every municipality shall post its current strategic asset management policy and asset management plan on a website that is available to the public, and shall provide a copy of the policy and plan to any person who requests it.

TABLE 1

WATER ASSETS

| Column 1<br>Service attribute | Column 2<br>Community levels of service (qualitative descriptions) | Column 3<br>Technical levels of service (technical metrics) |
|---|---|---|
| Scope | 1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system.<br>2. Description, which may include maps, of the user groups or areas of the municipality that have fire flow. | 1. Percentage of properties connected to the municipal water system.<br>2. Percentage of properties where fire flow is available. |
| Reliability | Description of boil water advisories and service interruptions. | 1. The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system.<br>2. The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system. |

TABLE 2

WASTEWATER ASSETS

| Column 1<br>Service attribute | Column 2<br>Community levels of service (qualitative descriptions) | Column 3<br>Technical levels of service (technical metrics) |
|---|---|---|
| Scope | Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system. | Percentage of properties connected to the municipal wastewater system. |
| Reliability | 1. Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes.<br>2. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches.<br>3. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.<br>4. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in paragraph 3.<br>5. Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system. | 1. The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.<br>2. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.<br>3. The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system. |

TABLE 3

STORMWATER MANAGEMENT ASSETS

| Column 1<br>Service attribute | Column 2<br>Community levels of service (qualitative descriptions) | Column 3<br>Technical levels of service (technical metrics) |
|---|---|---|
| Scope | Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system. | 1. Percentage of properties in municipality resilient to a 100-year storm.<br>2. Percentage of the municipal stormwater management system resilient to a 5-year storm. |

TABLE 4

ROADS

| Column 1<br>Service attribute | Column 2<br>Community levels of service (qualitative descriptions) | Column 3<br>Technical levels of service (technical metrics) |
|---|---|---|
| Scope | Description, which may include maps, of the road network in the municipality and its level of connectivity. | Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality. |
| Quality | Description or images that illustrate the different levels of road class pavement condition. | 1. For paved roads in the municipality, the average pavement condition index value.<br>2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor). |

TABLE 5

BRIDGES AND CULVERTS

| Column 1<br>Service attribute | Column 2<br>Community levels of service (qualitative descriptions) | Column 3<br>Technical levels of service (technical metrics) |
|---|---|---|
| Scope | Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists). | Percentage of bridges in the municipality with loading or dimensional restrictions. |
| Quality | 1. Description or images of the condition of bridges and how this would affect use of the bridges.<br>2. Description or images of the condition of culverts and how this would affect use of the culverts. | 1. For bridges in the municipality, the average bridge condition index value.<br>2. For structural culverts in the municipality, the average bridge condition index value. |

## COMMENCEMENT

**Commencement**

**11. This Regulation comes into force on the later of January 1, 2018 and the day it is filed.**