COMPREHENSIVE ASSET MANAGEMENT PLAN FOR CORE ASSETS

Roads, Storm, Bridges and Structural Culverts 2022

Tillsonburg

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1. EXECUTIVE SUMMARY

All background information and reports upon which information within this report is based will be provided upon request.

Asset management has undergone several fundamental changes over the last 20 years. It is now recognized as the correct approach for organizations wishing to ensure that they continue to improve their performance. Municipalities that embrace social and environmental responsibility, gain the respect and trust of the public and have a positive impact both locally and globally.

Core AM program goals are, employee and public safety, compliance, sustainable funding, operational reliability, environmental sustainability and customer satisfaction. The Town of Tillsonburg's asset management planning process plays a key part in moving the Town's Strategic Priorities forward. Implementing and sustaining the Town's vision requires a thoughtful and long-term process and plan to manage infrastructure assets and the services that they deliver. This Asset Management Plan (AMP) provides a set of practical tools to understand, plan, and communicate how the investments in assets that the Town is making today and in the future will support a balance between growth and the environment, and fiscal responsibility.

What we provide:

The initial installation, maintenance and eventual replacement of infrastructure has always been one of the most important responsibilities of a municipality. The asset pool of local governments is quite different to that of most large businesses. It comprises of a diverse array of asset types, which perform a critical function for thousands of residents, workers and visitors. The total value of the assets is immense. In recent years, asset management has been linked to fiscal sustainability.

The Town of Tillsonburg is responsible for a variety of capital assets including:

- Linear infrastructure such as roads, bridges, culverts, retaining walls, sidewalks, streetlights, signalized intersections, stormwater sewers, and stormwater management ponds.
- Buildings including the community center, fire hall, operations, customer service center, museum, and administrative offices.
- Land improvements such as sports fields, cemeteries, parking lots, parks and playgrounds.
- Vehicles and equipment including fire trucks, snowplow trucks, and specialized equipment.

This Asset Management Plan includes core assets that provide services to the Town of Tillsonburg, being roads, bridges & structural culverts, and stormwater infrastructure. The scope of the plan will expand to include non-core assets such as fleet, parks, facilities, IT

assets, and recreational amenities. **Figure 1** below illustrates the replacement cost breakdown of the Town's **$232.3 Million** core asset inventory.

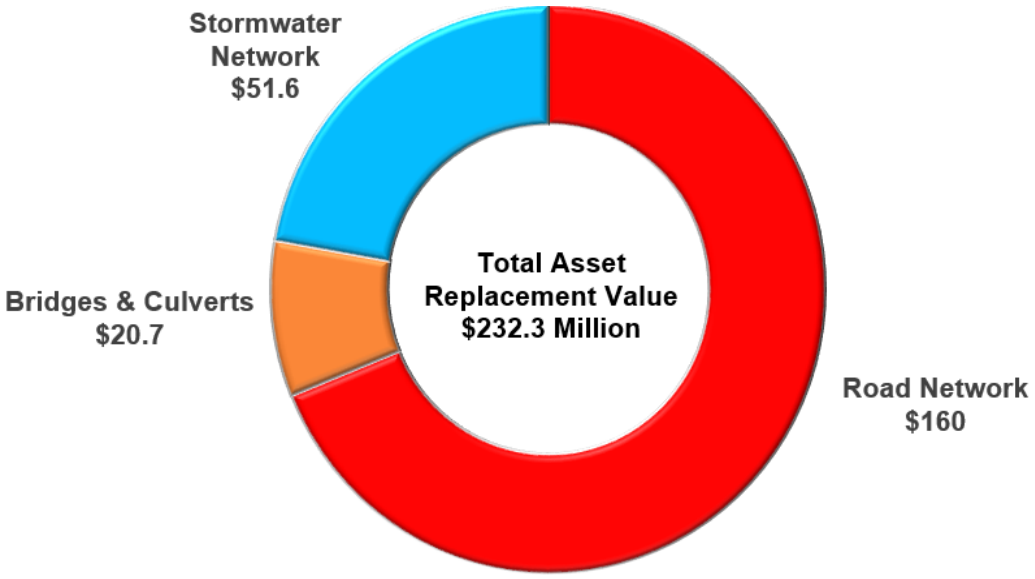


Figure 1. Core Asset Replacement Cost Breakdown

What we will do

The ability for the Town of Tillsonburg to provide services to the community relies on the existence of a network of assets and is restricted by the condition that those assets are in. The figure below illustrates the current condition of the Towns assets. Choosing a financially sustainable level of service and maintaining, rehabilitating and replacing assets in order to meet that level of service in the most efficient and effective manner is important for the fiscal health of the community. Although the majority of Town assets are relatively new and in good condition, expenditures are required for life-cycle strategies to address Poor and Very Poor assets, prevent other assets from reaching Poor condition, and maintain service levels.

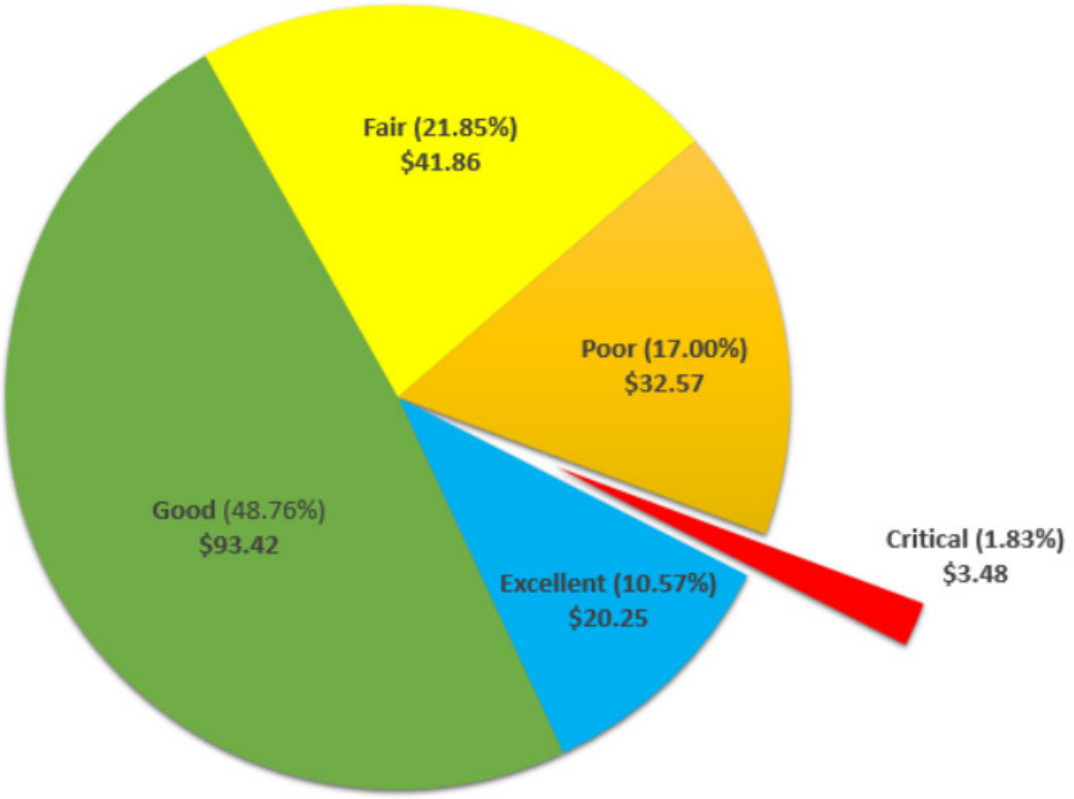


Figure 2. Core Asset Current Condition with Replacement Value ($ Millions)

The Town of Tillsonburg will use this comprehensive Asset Management Plan (AMP) to help maintain its infrastructure and provide services to the community. The AMP will be instrumental in ensuring that the Town is able to meet the financing needs associated with keeping assets in the condition they need to be in now and in the future.

This Asset Management Plan:

- Fulfills the provincial requirements outlined in O. Reg. 588/17 and the Building Together Guide for Municipal Asset Management Plans published by the Ontario Ministry of Infrastructure.
- Is a living document that will be continuously updated as new information is obtained and refined as capital work is undertaken.
- Facilitates efficiency and effectiveness for the capital program and related operating costs.
- Includes consideration of risk management, service levels, and condition assessments to inform capital investments.
- Will be a resource for staff and Council when making decisions that impact how funds are raised, allocated, and ultimately how projects are prioritized as those funds are spent.

What will it cost

Utilizing 2021 MPAC data a 'cost per household' (CPH) analysis was conducted for each of the asset classes (table 1) to determine the financial obligation of each household (7790 households for 2021) in sharing the replacement cost of the municipality's assets.

Table 1. Core Asset Replacement Cost per Household

Network	2021 Replacement Value ($ Millions)	Average EUL	Annual Requirement ($ Millions)	Annual Cost per Household (7790)
Roads	160	44	3.53	$453.78
Bridges	20.7	60	0.35	$ 44.93
Storm	51.6	80	0.65	$ 83.44
		Total	**4.63**	**$592.15**

How to Get There

Long-term infrastructure forecasts help provide insight into investment requirements and replacement trends that allow for the development of appropriate financing strategies. If the respective investment requirements are not addressed appropriately, levels of service could potentially decrease and operations and maintenance costs could increase.
The data shows a requirement of $4.63 million yearly in order to sustainably maintain current levels of service for core assets. Table 2 below summarizes the 5-year (2017 – 2021) average funding levels and the gap in infrastructure funding based on historical funding levels.

Table 2. 5-Year Average Funding Levels (2017-2021) for Core Assets

Network	Gas Tax	Taxation	Reserves	DC Reserves	Debt	User Debt	Other	Total
Roads	$392,537	$404,600	$90,120	$295,191	$146,000	$0	$13,040	**$1,341,489**
Bridges	$0	$0	$0	$0	$0	$0	$0	**$0**
Storm	$0	$196,220	$49,800	$126,180	$20,000	$0	$0	**$392,200**
							Total	**$1,733,689**

Deficit = $1.73M (average allocated funding) – $4.63M (average annual budget required for sustainability) = **- $2.9M shortfall for Core Assets**

Next Steps

As the Asset Management Plan continues to develop and expand it will become an integral part of the Town's operations. The Asset Management Plan will inform the Town's new 10-year capital budget and related long-range financial plans, thereby assisting the Town in achieving its strategic goals. As the Town begins to extend the time horizon in its planning framework, long-term planning will become more integrated with other planning processes as experience with planning is gained. This is especially true with regards to integration with the budget process and strategic planning, where a combined long-term financial and strategic planning process becomes an immediate precursor to the budget process. Tie in the Official Plan, where land use is a major determinant of a municipality's revenue structure, and drives the type and amount of service it is required to provide, making the linkage between comprehensive land-use planning, asset management, and long term financial planning an important one.

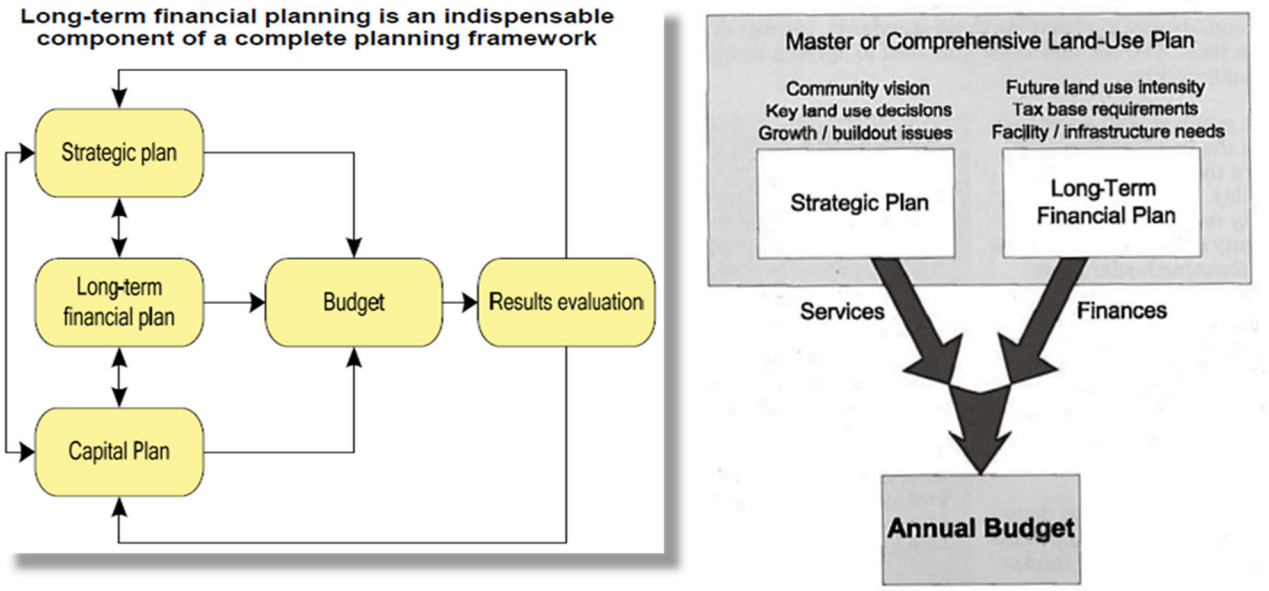


Figure 3. Long-term Planning

The following items will engage the support of the community, improve and advance AMP development, and support Council's decision making to meet community expectations and ensure the long-term sustainability of the Town.

- Communicate the Asset Management Plan to the community to increase awareness of growth patterns and the infrastructure needed to support it.
- Continue the transition from an aged-based to a condition-based dataset through ongoing field measured condition assessment and inspection programs.
- Expand the AMP to include all asset classes and their full lifecycle, align with operational activities, and inform annual budget discussions.
- Develop an expanded policy framework to support long-term sustainability.

2. INTRODUCTION

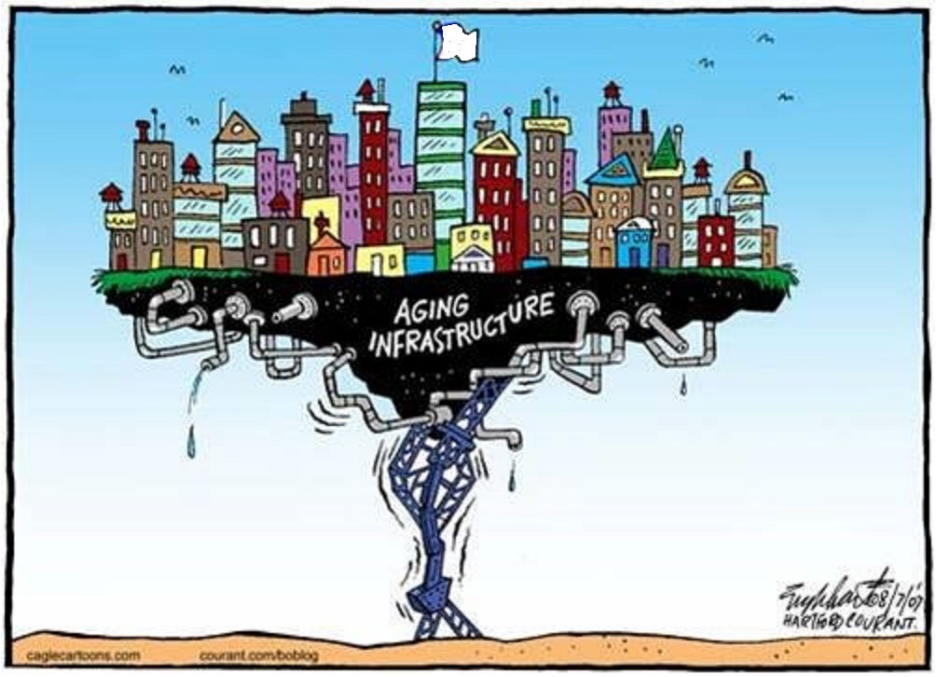


Figure 4. Aging Infrastructure

In many parts of Ontario, existing infrastructure is degrading faster than it is being repaired or replaced, putting services at risk. Important regulatory changes have occurred in Ontario that has increased the need for a municipality's emphasis on capital planning. Starting in 2007, the Public Sector Accounting Board (PSAB 3150) introduced new accounting standards for tangible capital assets owned by governments in Canada. Accrual accounting was required for government services and many capital assets needed to be depreciated for the purposes of financial reporting. Although acquisition and depreciation costs are not ideal for financial planning, PSAB 3150 helped municipalities to better understand the magnitude of asset funding gaps.

To further address the issue of aging infrastructure, in 2012, the Ontario Ministry of Infrastructure released the "Building Together: Guide for Municipal Asset Management Plans", a how-to guide to assist municipalities in preparing an AMP.

In 2015, Ontario passed the Infrastructure for Jobs and Prosperity Act, which affirmed the role that municipal infrastructure systems play in supporting the vitality of local economics. After a year-long industry review, the Province created Ontario Regulation 588/17 – Asset Management Planning for Municipal Infrastructure under the infrastructure for Jobs and Prosperity Act. O. Reg. 588/17 (effective January 1, 2018) further expands on the Building Together guide, mandating specific requirements for municipal Asset Management Polices and Asset Management Plans, phased in over a five-year period. The purpose of the regulation is to implement best practices throughout the municipal sector and provide a degree of consistency to support collaboration between municipalities and the Province.

This regulation aims to help municipalities more clearly identify what their infrastructure needs are, thus, helping municipalities work towards a more sustainable position regarding the funding of their infrastructure. This regulation provides an outline of the content to be included within future versions of a municipality's Asset Management Plans, as well as the associated completion deadlines.

Table 3 provides a summary of the key regulatory timelines as outlined by Regulation 588/17 and where the Town currently stands in the timeline.

Table 3. Regulation Timelines

Ontario Regulation 588/17 Timeline	
Regulation Timeline	**Requirement**
July 1, 2019	Date for municipalities to have a finalized strategic asset management policy that promotes best practices and links asset management planning with budgeting, operations, maintenance and other municipal planning activities.
July 1, 2022	Date for municipalities to have an approved asset management plan for core assets (**roads, bridges** and culverts, water, wastewater and **stormwater management systems**) that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2024	Date for municipalities to have an approved asset management plan for **all** municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2025	Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that builds upon the requirements set out in 2023. This includes an identification of proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund these activities.

Municipal infrastructure gets people and goods moving, provides safe drinking water, handles our waste, creates spaces for sport and recreation, and helps protect our homes against flooding and other natural disasters. It is the foundation that the daily life of Canadians is built upon. The strength of this foundation enables communities and local businesses to grow, and ensures Canadians have a high quality of life.

It is commonly known that municipalities do not have enough budget dollars available to fully fund asset replacement/renewal when each asset's expected useful life expires. Municipalities are being forced to find ways to keep and maintain assets beyond their

normal lifespan due to these financial constraints. Capital budget dollars need to be properly prioritized so that critical infrastructure is renewed before it fails.

The Town is responsible for a diverse array of capital assets, all competing for limited available funds. The initial construction and/or commissioning of infrastructure, its maintenance, and eventual replacement has always been among the most important responsibilities of a municipality. The asset pool of local governments is quite different to that of most large, private sector businesses. It is comprised of asset types, which perform critical functions for thousands of residents, workers and visitors, and forms part of a higher order of systems, such as roads providing a transportation network service. The total value of these assets is significant. Since governments have long held a role of administering assets, the formal concept of asset management is not new; however, the linkage of asset management to fiscal sustainability principles has become more prevalent in recent years.

The Purpose of Asset Management

Asset management is the coordinated activity in place to manage the way in which the Town realizes value from its assets in order to provide services effectively and in a financially sustainable manner.

OR

From an organizational objective, Asset Management is the set of activities associated with:

- *Identifying what assets are needed*
- *Identifying funding requirements*
- *Acquiring assets*
- *Providing logistic and maintenance support for assets*
- *Disposing and renewing assets*

so as to effectively and efficiently meet the desired objective. [1] The primary focus of asset management is the long-term life cycle of assets and their sustained performance, while seeking to minimize total costs of acquiring, operating, maintaining and renewing assets.

From this definition we see that asset management encompasses a broader set of activities than “maintenance”, which is primarily concerned with keeping existing equipment in operating condition. Asset management is concerned with applying technical and financial judgement and sound management practices to deciding what assets we need to meet our business aims, and then to acquiring and logistically sustaining the assets over their whole life, through to disposal.[2]

[1] Physical Asset Management With an Introduction to ISO55000, Hastings (2015), Pg 10
[2] Physical Asset Management With an Introduction to ISO55000, Hastings (2015), Pg 11

An asset management plan is a strategic document that states how a group of assets is to be managed over a period of time. The plan describes the characteristics and condition of infrastructure assets, the level of service expected from them, planned actions to ensure the assets are providing the expected level of service, and financing strategies to implement the planned actions.

Asset management takes more of a long-term perspective, which results in more informed strategic decisions that optimize investments to better manage risk of infrastructure while taking into consideration other important factors, such as official plans, strategic initiatives, and climate change. Good asset management does not only maximize the benefits provided by the infrastructure, but also affords the opportunity to achieve cost savings by spotting deterioration early on and taking action to rehabilitate or renew the asset.

Asset management represents a way of doing business that bases decisions on quality data. The goal of an asset management program is to build, maintain and operate infrastructure cost effectively, provide value to the customer, and improve the credibility and accountability of the municipality. Asset management is a move away from the current infrastructure management system to managing a network of interrelated assets with interdependent programs and services so that scarce resources ($) are properly allocated amongst competing asset needs.

Some of the benefits of asset management include:

- Providing the ability to show how, when, and why resources need to be committed by knowing the total investment required to maintain infrastructure assets at acceptable levels to support sound decision making.
- Decisions can be made between competing assets needs to ensure that the priorities of each asset type are being met, reducing the amount of unplanned or high priority maintenance/emergency activities that require response before the next budgeting cycle.
- Monitoring the performance of assets over the long term to ensure an adequate level of service is maintained and the ability to measure the progress made in achieving the performance targets.
- Life-cycle costing to identify the investment required to operate, maintain, renew, and replace an asset. Determining how much it will cost enhances financial planning and helps decision makers to select the most cost effective options; and funding decisions can be made with a view of the total cost to be incurred over the useful life of an asset.

Goals and Objectives

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost-effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a life-cycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a long-term financial plan, which identifies required, affordable expenditure and how it will be allocated.
- Other references to the benefits, fundamentals principles and objectives of asset management are:

    1. International Infrastructure Management Manual 2015
    2. ISO 55000: Overview, principles and terminology

Table 4. Goals and Objectives

Goal	Objective	How Goal and Objectives are addressed in AM Plan
Excellence in local government.	The Town of Tillsonburg will strive to be an accountable local government by communicating seamlessly with citizens and other levels of government, and will continuously act to meet the evolving needs of the Town.	The Town of Tillsonburg Asset Management Plan provides guidance to the organization for engaging the community with regard to asset management and service delivery.
Economic Sustainability	The Town will work towards long term financial sustainability.	The Town of Tillsonburg Asset Management Plan outlines best practices for the financial stewardship of municipal assets, and will serve as a tool for long term financial planning.

Relationships to Other Plans and Programs

The Town's Asset Management Plan (AMP) will be a key component of the municipality's strategic planning process, linking with multiple other corporate plans and documents such as:

- Official Plan: The AMP will influence land use policy directions for long-term growth and development as provided through coordination with the budgeting process.
- Community Strategic Plan: The AMP will support the Economic Sustainability and Excellence in Local Government in Tillsonburg's vision to become a regional hub for employment, recreation and culture.
- By-laws, Standards, and Policies. The AMP will influence policies and by-laws related to infrastructure management practices and standards.
- Regulations: The AMP must recognize and abide by industry and senior government regulations.
- Business Plans: The service levels, policies, processes, and budgets defined in the AMP will be incorporated into business plans as budgets, management strategies, and performance measures.

Updates to existing and future municipal plans and programs having a direct or indirect impact on municipal assets, including municipal properties and facilities should reference the Town's AMP and consider the impact on capital planning and future projections.

3. COMPONENTS OF AN EFFECTIVE ASSET MANAGEMENT PLAN

In order for a plan to be considered a complete asset management program, it should include all of the following components:

State of Local Infrastructure

For each Asset Category, the State of the Local Infrastructure section includes the following information:

- A summary of the assets in that category including quantities. The inventory figures within the plan also capture assets within new subdivisions constructed to the end of 2021, that the Town is aware of and anticipates assuming ownership of. It is important to include this new infrastructure to ensure that life-cycle activities are planned and funded accordingly.
- An estimated replacement value of the assets. The replacement cost valuations are based on 2010 tender prices, where available. However, considering the impact of COVID on construction costs these figures should be revisited in a reasonable amount of time post COVID. Replacement values include excavation and landscaping costs which significantly increase the overall replacement cost of linear assets.

- A summary of the average age and an age distribution as a proportion of estimated useful life of the asset.
- A summary of the information available on the condition of the assets in the category.
- A description of the data sources used to populate the State of Local Infrastructure information, including any relevant condition assessment polices/practices.

Table 5. Infrastructure Report Card

Town of Tillsonburg Infrastructure Report Card		
Asset Network	**Condition vs. Performance Rating**	**Funding vs. Need Rating**
Roads	**B** Good (73%)	**D** Poor (46%)
Bridges	**B** Good (75%)	**F** Very Poor (0%)
Structural Culverts	**C** Fair (43%)	**F** Very Poor (0%)
Storm	**C** Fair (53%)	**F** Very Poor (31%)

Each asset network is rated on two key, equally-weighted (50/50) dimensions: Condition vs Performance, and Funding vs Need. The Overall Rating is the average of the two dimensions converted to letter grades.

Based on the Summary Report Card results it can be expected that the future Condition vs. Performance rating of assets will significantly diminish without considerable improvement to the Funding vs. Need rating.

Asset Rating Criteria

Each asset network will ultimately be evaluated based on two key dimensions, Condition vs. Performance and Funding vs. Need.

Condition vs. Performance

A combination of the Estimated Service Life (ESL) and known asset condition (where available) was used to estimate the Percentage of Remaining Service life (%RSL) for each asset. The %RSL for each asset was then weighted (based on replacement value), and used to provide the weighted average %RSL for the asset. Assets are then placed into one of five rating categories ranging from Very Good to Very Poor as shown in **Table 6** below. Individual infrastructure asset scores were then aggregated up to the Component level and then to the Network level in order to provide an overall system Condition vs. Performance rating.

Asset Estimated Service Life

An asset's ESL is the period of time that it is expected to be of use and fully functional to the Town. Once an asset reaches the end of its service life, it will be deemed to have deteriorated to a point that necessitates replacement. The ESL for each asset component was established by using a combination of Town staff knowledge and experience, as well as industry standards. Individual ESL's was used in conjunction with the original installation dates to determine the theoretical Remaining Service Life (RSL) of each asset.

Asset Condition

The Town undertook a Pavement Condition Assessment project which used specialized equipment and vehicles. This type of inspection provides more comprehensive condition data than a visual based inspection. Currently, storm network condition is based solely on age; however, the interior of stormwater pipes can be inspected using CCTV (closed circuit television) inspection, providing a much better understanding of current condition. These inspections are guided by standard principals of defect coding and condition rating that allow for a physical condition "score" for the infrastructure to be developed. For infrastructure without a standardized approach to condition assessment scoring, information such as visual inspections, bridge audits, annual pavement inspections and other maintenance related observations can be used in establishing the condition of the asset.

Table 6. Rating Categories based on Service Life and Condition

Rating Category	Letter Grade	% of Remaining Service Life (RSL)	Definition
Very Good	**A**	81% - 100%	**Fit for the Future** - The infrastructure in the system or network is generally in very good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention.
Good	**B**	61% - 80%	**Adequate for Now** - Some infrastructure elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies.
Fair	**C**	41% - 60%	**Requires Attention** - The infrastructure in the system or network shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies.
Poor	**D**	21% - 40%	**At Risk** - The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
Very Poor	**F**	< 20%	**Unfit for Sustained Service** - The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service or has effectively exceeded its theoretical service life.

Funding vs. Need

The second evaluation criterion reflects the status of funding dedicated to maintain, rehabilitate, replace, and improve the current condition of existing infrastructure. Infrastructure systems need funding that is dedicated, indexed, and long-term. The primary measure is the actual amount of funding provided versus the investment required to meet or maintain the desired levels of service. This ratio is then placed into one of five rating categories ranging from Very Good to Very Poor as shown in **Table 7** below.

The plan uses the 2021 budgeted spending, funded by traditional sources of municipal funds and committed senior government grants. Traditional sources of municipal funds include taxation, reserves and debt. Development charges are not typically used for asset management as by definition, projects funded by these levies are new growth projects and do not include the rehabilitation and maintenance of pre-existing infrastructure. Committed senior government grants include programs such as the federal and provincial

gas tax where an ongoing agreement has been executed. Funding received as part of a onetime grant program is not included as the Provincial requirements for asset management plan specifically excludes these types of grants. While the funding versus need ratio is expressed as a percentage of dollars it is important to recognize that dollars are not the only scarce resource that limits annual spending. Time is a major factor as well. Even if there were revenue sources available to completely fund annual needs requirements, consideration must be made for available staff time that is required to manage the projects undertaken.

When calculating need, replacement costs are entered onto a timeline over the expected useful life of each network, using both condition and age information for each asset. Maintenance and construction costs also need to be considered in the evaluation of need. Steady funding provides for maintenance that extends the life of infrastructure. Once the replacement profile is determined, the average annual spending requirement can be calculated. This is the measure of a steady annual investment that would be required to meet future needs completely. This measure is provided in current year dollars and does not take inflation into account.

Dedicated funds such as user fees and development charges need to be applied only to infrastructure systems for which they are raised. Indexing means that funds need to increase as the use of the system increases, or as the cost of providing the service increases. Maintenance and construction costs also need to be considered in the evaluation of funding. Steady funding provides for maintenance that extends the life of infrastructure. Long-term, multi-year funding plans should account for growth estimates so that projects can be designed and constructed in anticipation of needs, and not simply in reaction to inadequate capacity or problems caused by poor maintenance.

Table 7. Rating Categories based on Funding Levels

Rating Category	Letter Grade	Description
Very Good	**A**	91% - 100% of the Funding need is supported.
Good	**B**	76% - 90% of the Funding need is supported.
Fair	**C**	61% - 75% of the Funding need is supported.
Poor	**D**	46% - 60% of the Funding need is supported.
Very Poor	**F**	< 45% of the Funding need is supported.

Current Levels of Service

Levels of Service Defined: "the parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers" (ISO 55000)

Purpose of Level of Service: Listed below are the key objectives of a Level of Service framework:

- To provide transparency
- To provide accountability
- To provide for repeatable and consistent measurement, reporting, auditing of inputs, outputs and outcomes
- To ensure efficiency in service delivery
- To ensure long-term financial viability in service delivery
- To align service delivery to organizational goals
- To extract value from assets and ensure positive relations with stakeholders
- To optimize the delivery of services

A level of service (LOS) is a measure of what the municipality is providing to the community and the nature and quality of that service. Within each asset class in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the municipality as worth measuring and evaluating. The municipality measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

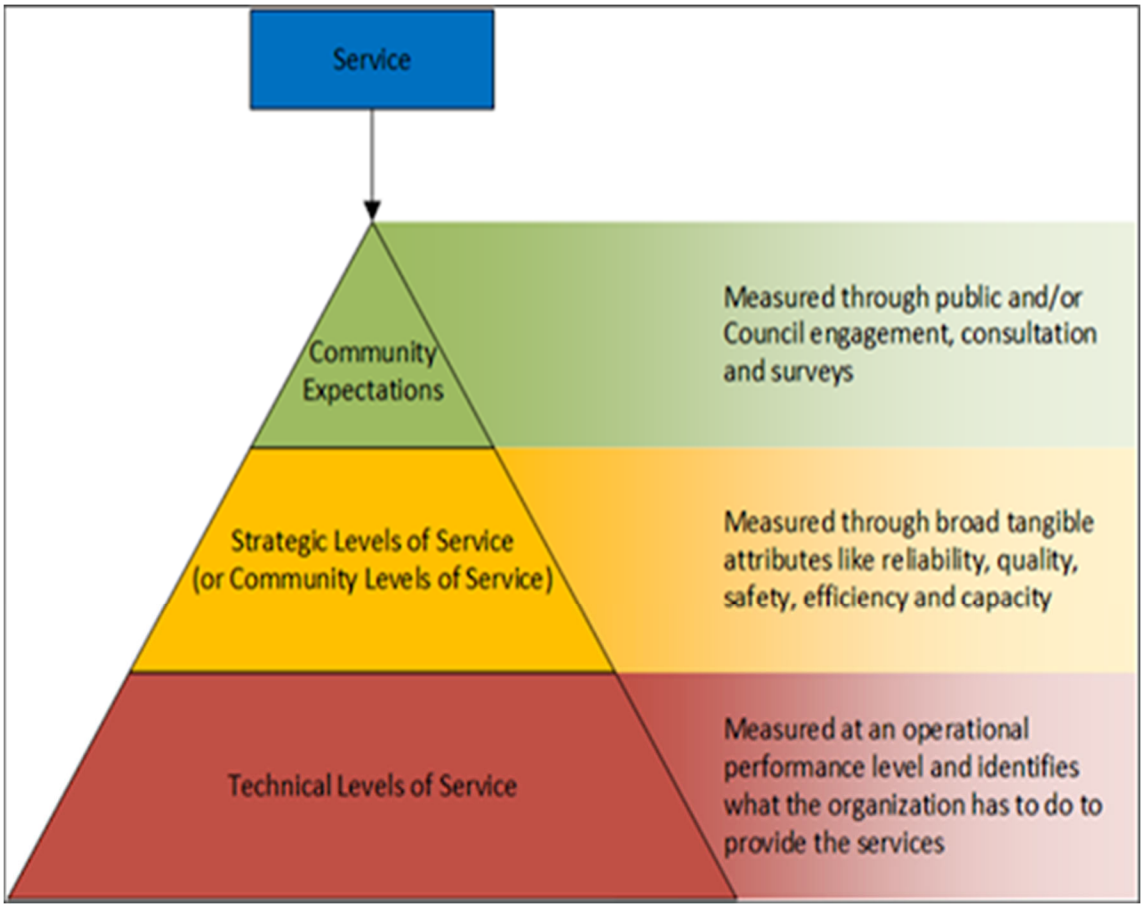


Figure 5. Levels of Service

Technical Levels of Service

Technical service measures are linked to the activities and annual budgets covering:

- **Operations** – the regular activities to provide services (e.g. opening hours, cleaning, mowing grass, energy, inspections, etc.),
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs),
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),
- **Upgrade/New** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).

Community Levels of Service

Measures how the customer receives the service and whether value to the customer is provided. Customer levels of service measures used in the asset management plan are:

- **Quality:** How good is the service … *what is the condition or quality of the service?*
- **Function:** Is it suitable for its intended purpose …. *Is it the right service?*
- **Capacity/Use:** Is the service over or under used … *do we need more or less of these assets?*

Table 8. Current Levels of Service Explanatory Table

	Community Levels of Service	Technical Levels of Service
Description	Provides a simple, plain language description or measure of how the community receives or experiences the services that the municipality provides.	Provides a quantitative measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures.
Core Assets	For core asset categories (Roads, Bridges & Culvert and Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP.	For core asset categories (Roads, Bridges & Culverts, and Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

Table 9. Road Corridor Assets Levels of Service Summary

ROAD CORRIDOR CORE ASSETS LEVELS OF SERVICE				
Strategic Service Objective	**Customer Level of Service**	**Affected Asset Class**	**Potential Threats**	**Technical Levels of Service**
A safe, reliable road network	Safe and comfortable commuting	Pavement	Cracking & rutting, potholes	Average Pavement Condition Index = 65.9
		Bridges	Steel component corrosion, concrete deterioration, embankment erosion, excessive deck cracking	Average Bridge Condition Index = 69.1
		Structural Culverts	Concrete deterioration, barrel distortion, embankment erosion, excessive deck cracking	Average Structural Culvert Condition Index = 68.6
		Sidewalks	Horizontal separation, cracks, holes	Average Sidewalk Condition Index = 63.4

Table 10. Stormwater Network Assets Levels of Service Summary

STORMWATER NETWORK ASSETS LEVELS OF SERVICE				
Strategic Service Objective	**Customer Level of Service**	**Affected Asset Class**	**Potential Threats**	**Technical Levels of Service**
Efficient drainage and flood protection	Protection from flooding, aquatic environment protection	Storm Collection System	Blockages, pipe deterioration, climate change, under design	Age based condition = Fair - Excellent: 84%, Poor - Critical: 16%
		Storm water management ponds	Inlet/outlet blockages, sediment accumulation, bank erosion	Age based condition = Fair - Excellent: 88%, Poor - Critical: 12%

Current Performance Levels

Performance measures or key performance indicators (KPIs) are another method of documenting and assessing levels of service (LOS). Performance measures provide a quantitative basis for analysis which enables trend analysis to determine if a municipality is moving towards or away from specified LOS objectives. For example, the use of condition ratings from a performance measure perspective allows municipalities to see what condition their assets are in now and also whether that condition rating is getting better or worse over time.

Performance measures (or KPIs) are developed to assess the overall performance of assets, service delivery, and/or business efficiency. These measures can assist in identifying action items (e.g. capital investment decisions, resource allocations, etc.) needed to move towards expected service level objectives. Technical LOS measures are needed for the justification of operational decisions and to support capital investment decisions, while strategic (community) measures are required to assess asset performance in terms of services provided to the customer. In both cases, performance measures used by a municipality should be meaningful, transparent, constant/consistent and easily measurable.

Currently, the Town of Tillsonburg measures the performance of their core assets based on meeting the standards established by legislative and regulatory requirements. These requirements prevent levels of service from declining below a certain standard. (i.e. Minimum Maintenance Standards for municipal highways).

Developing realistic LOS using meaningful key performance indicators (KPIs) can be instrumental in managing citizens' expectations, identifying areas requiring higher investments, driving organizational performance, and securing the highest value for money from public assets. The key objective is to develop and track only those KPIs that are relevant and insightful and reflect the priorities of the municipality. The development of well-defined KPIs for core and non-core assets will be defined in future updates of the AMP.

Council and staff will engage in discussions around all their asset classes with regard to service levels. What are the current service levels being provided? Are these levels meeting the public demands? Are these levels financially sustainable over the long term? Are increases or decreases in service wanted or needed in the future? Are possible changes in the current service level financially viable over the long term? When we have answers to these questions, long-term plans such as the Financial Sustainability Plan, identified in the Community Strategic Plan, will be put in place that meets these expectations and ensure we can provide the desired service level for each asset class.

It should be noted that increased (or decreased) service levels in one asset class can affect another asset class, so decisions on service levels cannot be made in isolation; a good example would be a decision to increase service levels for your unpaved road

infrastructure, which in turn may require additional and/or upgraded equipment and additional staff to realize this new expected service levels.

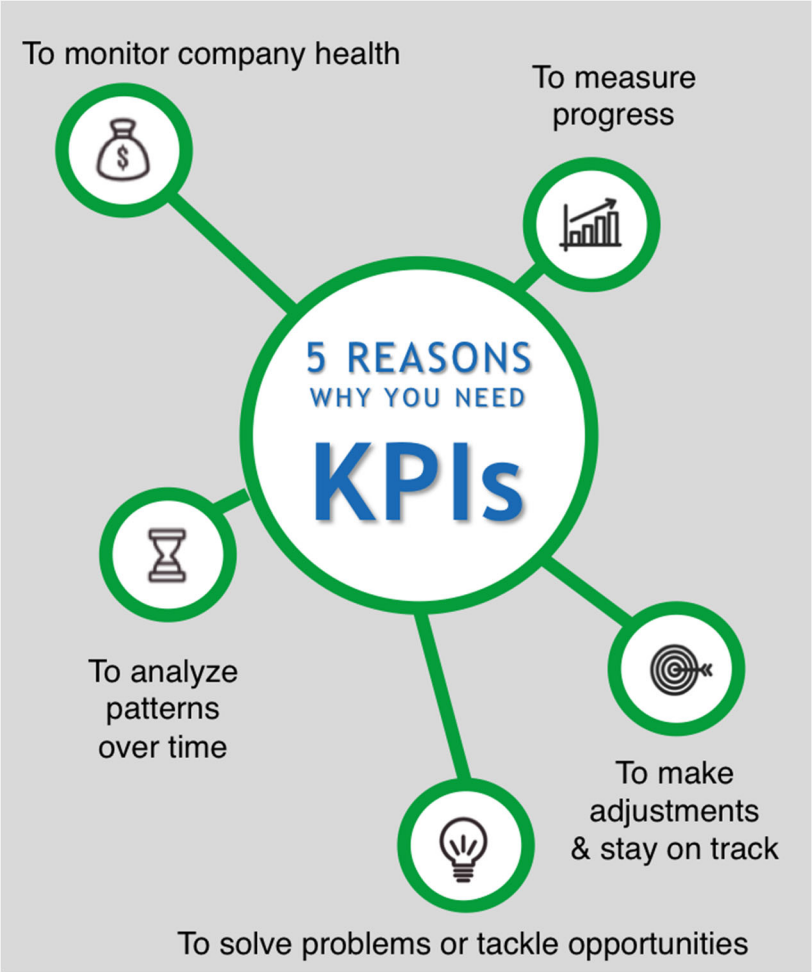


Figure 6. The Importance of Key Performance Indicators (KPIs)

Asset Lifecycle Management Strategy

The asset lifecycle management strategy is the set of planned actions that will enable the assets to provide the desired level of service in a sustainable way, while managing risk, at the lowest life-cycle cost. This AMP considers life-cycle activities over the next 10 years to maintain the current levels of service.

These planned actions and/or activities are the range of actions funded through significant operating and capital budgets on each of the asset categories. Asset life-cycle activities are generally grouped into categories as shown in **Table 13**.
Post construction, these activities include maintenance, rehabilitation, replacement, and disposal of the asset.

Table 11. Typical Asset Life-cycle Activities

Life-cycle Activity	Description	Examples
Non-Infrastructure Solutions	Actions that are taken to gain a better understanding of infrastructure needs, extend the asset useful life, or lower costs.	Better integrated infrastructure planning and land use planning, demand management, process optimization, managed failures
Maintenance	Proactive servicing of assets on a regular basis in order to fully realize the original service delivery expectation.	Pavement crack sealing, fixing potholes
Rehabilitation	Significant treatments intended to extend the life of the asset.	Road resurfacing, storm main relining
Replacement	Activities that occur when an asset has reached the end of its useful life and rehabilitation is no longer an option.	Road reconstruction, storm main replacement
Disposal	Activities associated with disposing of an asset once it has reached the end of its useful life, or it is no longer needed by the municipality.	Sale of redundant equipment
Growth/Service Improvement	Planned activities required to extend or expand municipal services to accommodate the demands of growth.	New Parks to service new subdivisions

Figure 7. Asset Life-cycle Management

Life-cycle consequences represent the anticipated outcomes in the event that the municipality does not undertake the recommended asset management activities during the recommended timeframes. Life-cycle consequences can include but are not limited to deterioration of the physical condition of the asset, a reduction in the outputs and service potential of the assets, increased operating costs, higher costs for subsequent asset management activities than would otherwise have been incurred had the Town undertaken the recommended asset management activities and/or a reduction in the estimated useful life of the asset.

Risk Management Strategies

It is important to assess the risk associated with each asset and the likelihood of asset failure. Asset failure can occur as the asset reaches its limits and can jeopardize public/environmental safety. In addition, certain assets have a greater consequence of failure than others do.

The Town of Tillsonburg Asset Management Strategy is founded on available data, anticipated service levels, and other assumptions. Assumptions in these areas introduce some unavoidable risk that the overall strategy may change over time as the Town evolves and develops more complete data and processes. Recognizing these uncertainties, Tillsonburg is developing strategies to address each source of risk so that the Asset Management Strategy can evolve over time.

While the timing of asset replacement is generally closely related to an asset's conditional assessment, a number of other factors such as financial costs, frequency of use, and criticality to the operations, should be considered when determining when an asset needs to be replaced. Risk is generally considered as the product of Probability (Likelihood) x Consequence. (**Table 14 & 15**) Risk factors for each asset category will be determined and assigned to either "probability" or "consequence" and then weighted in relation to their importance. Using an algorithm that considers these elements, a risk rating can be calculated for each asset. This risk rating should then be utilized as a guide to prioritize assets that require attention first and which capital works can be deferred.

Table 12. Risk Matrix

Consequence	Likelihood: 1 Rare	2 Unlikely	3 Possible	4 Likely	5 Almost Certain
5 Severe	**5**	10	15	20	25
4 Major	4	8	12	16	20
3 Moderate	3	**6**	9	12	15
2 Minor	2	4	**6**	8	10
1 Slight	1	2	3	4	**5**

Risk =	Very Low	Low	Moderate	High	Extreme

Table 13. Risk Matrix Score Range

Rating	Risk Score Range
Very Low	1-4.9
Low	5-6.9
Moderate	7-9.9
High	10-14.9
Extreme	15-25

Consequence of Failure

Failure can be defined as the condition at which an asset no longer meets its intended objective. Typically, the most critical assets are those with the highest consequence of failure, and not necessarily a high probability of failure.

The consequence of failure for linear assets can be characterized by examining the weighted balance of legal and regulatory, economic, social, environmental, and service delivery impacts as summarized in **Table 16**.

Table 14. Consequence of Failure Breakdown

Consequence of Failure	Legal & Regulatory (20%)	Economic (20%)	Social (20%)	Environmental (20%)	Service Delivery (20%)
Slight 1	Low level legal issues; technical non-compliance; legal and/or regulatory actions unlikely; limited regulatory scrutiny	Low level legal issues; technical non-compliance; legal and/or regulatory actions unlikely; limited regulatory scrutiny	No injuries or health impacts; no media coverage or loss of image	No impact or lasting damage; reversible within 1 week; located significant distance from environmental feature	No or few disruptions in non-essential services; impacts to minimized residential zone
Minor 2	Regulatory non-compliance; increased direct regulatory scrutiny	Repair costs; loss of income; damage to property; third party losses or fines $25K - $50K	Minor injuries or health impacts; possible local media coverage and loss of image	Minor, short-term repairable damage; reversible within 3 months; located significant distance from environmental feature	Minor (isolated) disruption in non-essential services; no or few disruptions in essential services; impacts to minimized residential zone
Moderate 3	Regulatory non-compliance with expected regulatory prosecution; possible fines; possible civil action by minor party	Repair costs; loss of income; damage to property; third party losses or fines $50K - $100K	Multiple minor injuries or health impacts; some local media coverage and loss of image	Moderate; medium-term repairable damage; reversible within 1 year; located in proximity to environmental feature	Major disruption in non-essential services with minor (isolated) disruption in essential services; impacts to increasing residential zone
Major 4	Multi-jurisdictional regulatory non-compliance with prosecution and fines; civil action by major party	Repair costs; loss of income; damage to property; third party losses or fines $100K - $200K	Serious injuries or health impacts; possible regional media coverage and significant loss of image	Long-term damage with repairable consequences; reversible within 3 years; located within regulated environmental area	Major disruption in essential services with some non-essential services unavailable; impacts to increasing residential zone or industrial zone
Severe 5	Multi-jurisdictional regulatory non-compliance with prosecution and significant fines; class action law suit	Repair costs; loss of income; damage to property; third party losses or fines > $200K	Loss of life, serious injuries or health impacts; extensive media coverage and loss of image	Long term damage with permanent lasting consequences; non-reversible; located within regulated environmental area within significantly	Some essential services unavailable; impacts to increasing residential zone; industrial zone or institutional zone

Probability of Failure

The probability of failure relates to the current condition state of each asset, whether they are in Very Good, Good, Fair, Poor, or Very Poor condition. The %RSL score is inversely proportional to the probability of failure and serves as a good indicator regarding the future risk of failure of an asset as described in **Table 17**.

Table 15. Probability of Failure Score

%RSL Rating Category	Probability of Failure Description	Probability of Failure Score
Very Good	Improbable	1
Good	Unlikely	2
Fair	Possible	3
Poor	Likely	4
Very Poor	Highly Probable	5

It is also important to recognize the risk associated with the Town's ability to deliver the plan while recognizing that any deviation may affect the overall ability to deliver service. **Table 18** below provides a summary of the identified risks, potential impacts and mitigating actions associated with the asset management program.

Table 16. Risk to the AMP

Corporate Risk to the Plan		
Risk	**Potential Impact**	**Mitigating Action**
Failed Infrastructure	• Delivery of Service • Asset and Equipment Damage • Environment compromised	• Repair and rehabilitate • when necessary • Increase investment • Perform condition assessments
Inadequate Funding	• Delivery of service • Increased risk of failure • Shorten asset life • Defer funding to future generations	• Reductions of service • Research and identify additional revenue sources
Regulatory Requirements	• Non-compliance • Mandatory investments • Increased costs	• Research and identify additional revenue sources • Lobby actions
Plan is not followed	• Reduced asset life • Inefficient investments • Prioritization process failure • Failure to deliver service	• Monitor and review • Create asset management network • Implement processes

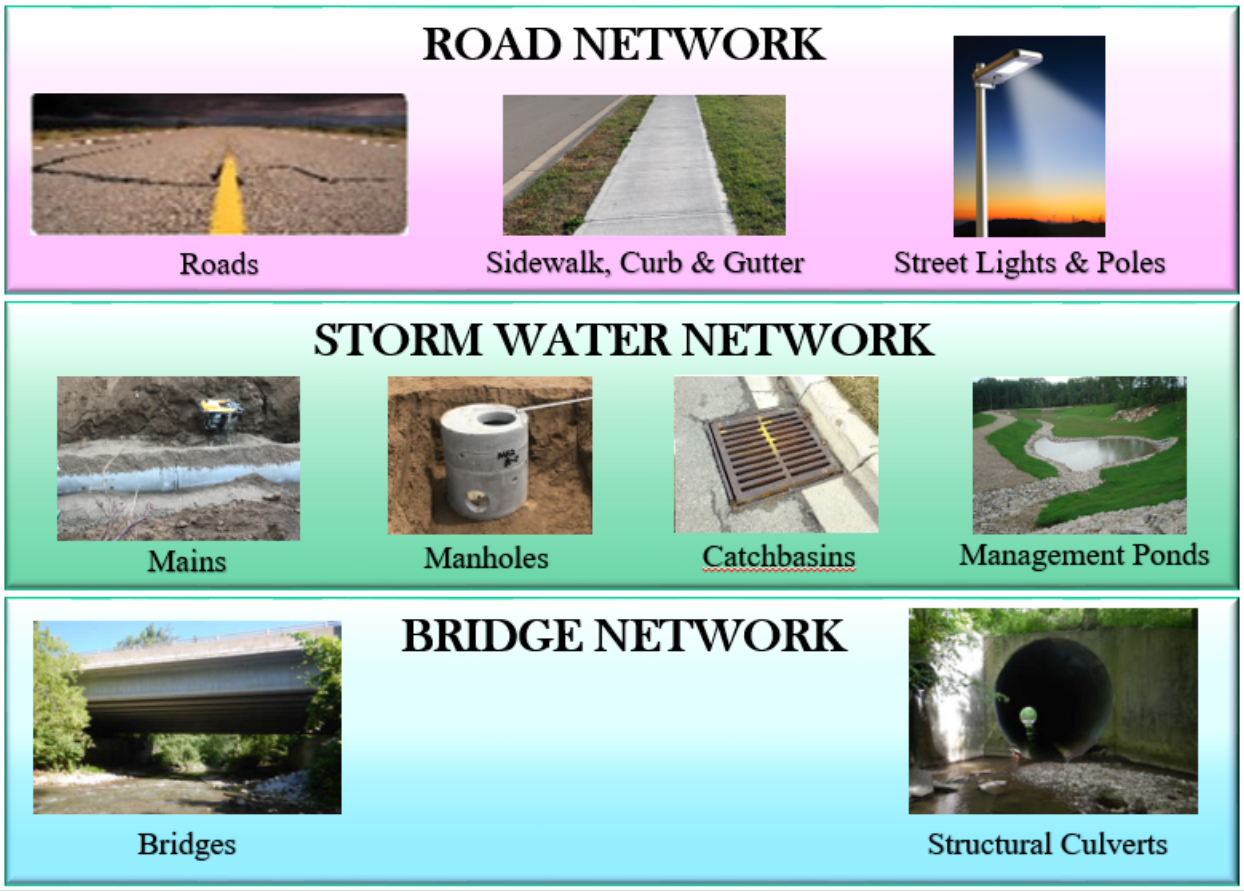
Table 17. Core-Asset Condition Table

Asset Network	Condition	Comments
Road Network	Good - Excellent (61%) Poor - Fair (39%)	PCI values were collected through a road condition assessment project completed in November 2020.
Bridge Network	Good - (75%) Fair - (25%)	BCI values were collected in 2021 through the bi-annual OSIM inspection project.
Storm water Network	Good - Excellent (56%) Poor - Fair (44%)	Storm condition is based solely on remaining service life. (refer to Table 20)

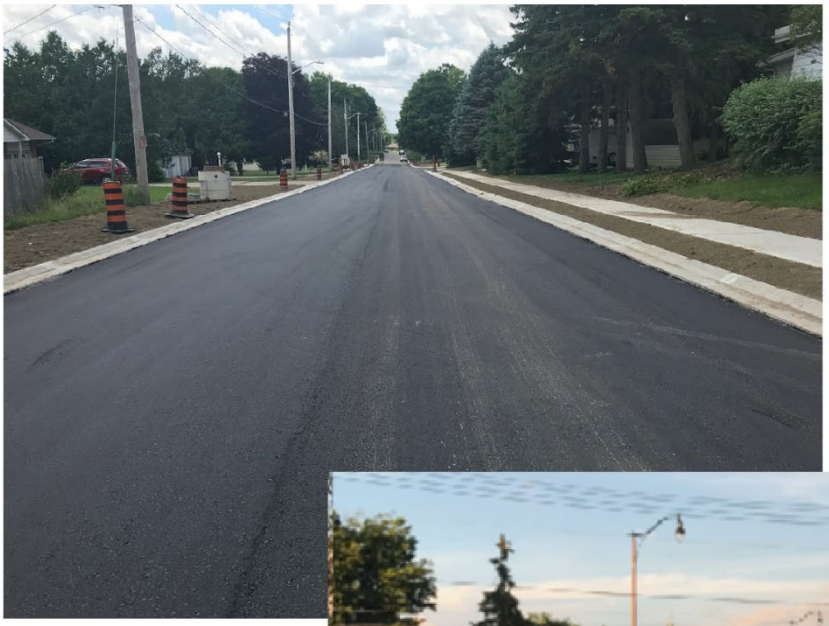
Table 18. Asset Condition Rating by Age

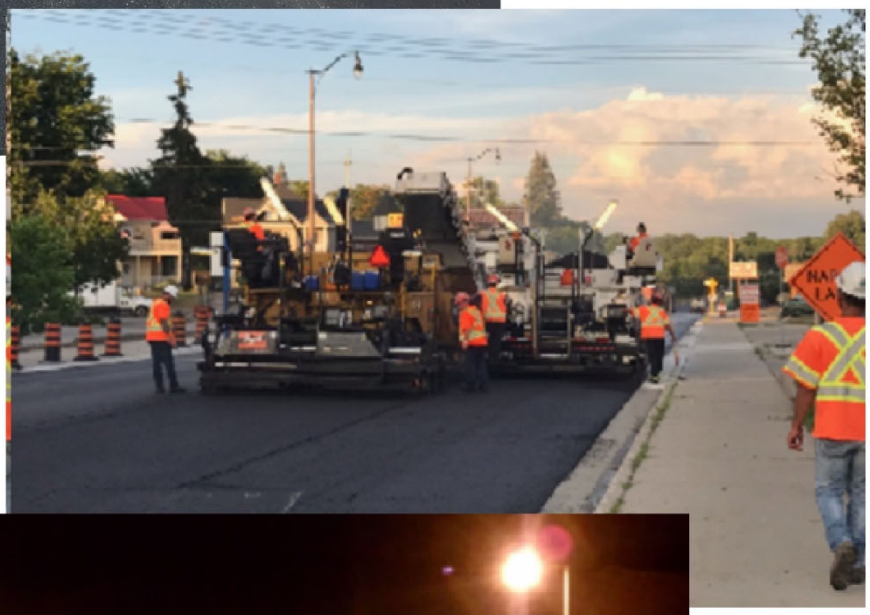
Rating Category	% of Remaining Service Life (RSL)	Definition
Excellent	81% - 100%	**Fit for the Future** - The infrastructure in the system or network is generally in very good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention.
Good	61% - 80%	**Adequate for Now** - Some infrastructure elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies.
Fair	41% - 60%	**Requires Attention** - The infrastructure in the system or network shows general signs of deterioration and requires attention with some elements exhibiting significant deficiencies.
Poor	21% - 40%	**At Risk** - The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
Very Poor	< 20%	**Unfit for Sustained Service** - The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service or has effectively exceeded its theoretical service life.

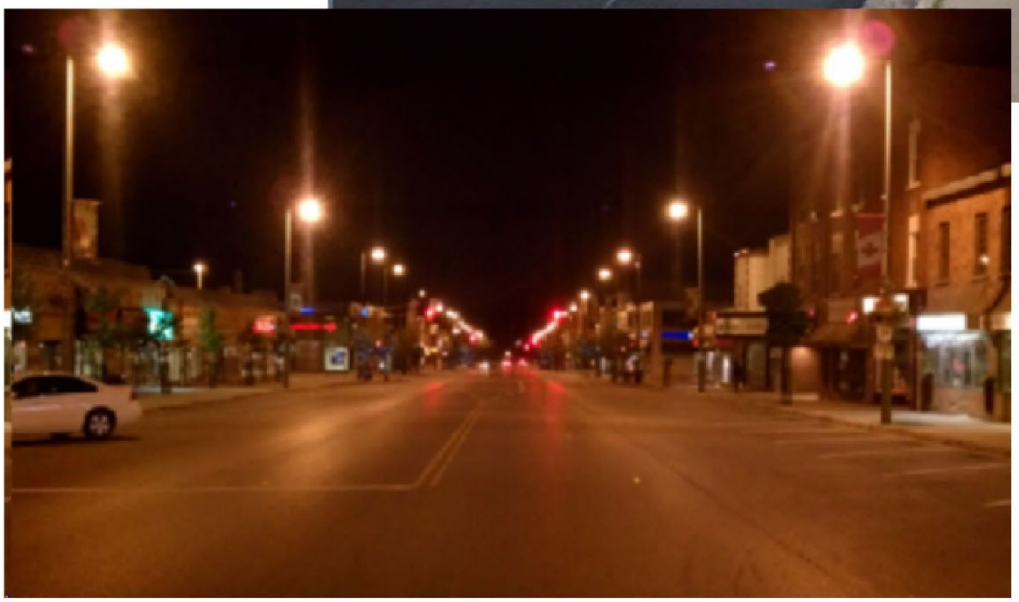
4. ASSET MANAGEMENT PLAN BY ASSET CATEGORY



Road Network







Road Network - State of the Local Infrastructure

Table 19. Road Network Breakdown

Asset Type	Asset Category	Length (km)/Quantity	Lanes (km)
Road Network (Tillsonburg Owned)	Arterial	17.6	39.7
	Collector	13.8	28.1
	Local	84.4	167.5
	Alley	5.8	5.8
	Total	**121.7**	**242.3**
	Sidewalks	105.2	
	Curb & gutter	169	
	Street Lights	3002	
	Poles	1529	
Road Network (County and MTO)	Arterial	7.1	16.9
	Collector	3.4	7.9
	Highway	4.9	9.7
	Total	**15.4**	**34.5**

Table 20. Road Network – State of the Local Infrastructure

Inventory	121.7 km of paved roads		
Replacement Value	**Road Component**	**Area (km^2)/quantity**	**Replacement Value (M) (2021)**
	Arterial	173.04	$22,656,352
	Collector	123.84	$15,258,450
	Local	677.4	$78,424,219
	Alley	26.81	$2,940,947
	Sidewalks	157.8	$14,157,351
	Street Lights	3002	$2,257,993
	Poles	1529	$4,982,399
	Curb & Gutter	169	$19,435,000
		Total	**$160,046,326**
Average Age	29 years		
Current Condition	**Condition of Town of Tillsonburg Owned Roads PCI Scores from 0 - 100**		
	Condition	**Length (km)**	**% of Total Length**
	Excellent (91 - 100)	4.5	3.7
	Good (76 - 90)	42.0	34.5
	Fairly Good (66 - 75)	27.8	22.8
	Fair (51 - 65)	23.7	19.5
	Poor (21 - 50)	20.7	17.0
	Critical (0 - 20)	3.0	2.5
	Total	**121.7**	**100**
Data Sources	**1:** Corporate GIS data. **2:** The condition of all roads within the Town of Tillsonburg were assessed in 2020 by Englobe Corp, using specialized equipment and vehicles. Reports are available, and all conditions have been uploaded to the Towns GIS system.		

Table 21. Road Network – Current Levels of Service

Community	**Scope:** Minimum maintenance standards as set out in O.Reg. 239/02 are followed. **See Appendix A** for a map showing the current road network within the Town of Tillsonburg.
	Quality: Number of lane-kilometres of all road segments as a proportion of square kilometres of land area of the municipality. Total lane km's = 267.1, total (includes Tillsonburg, MTO and County owned roads) municipality area = 22 sq/km's. Result is 12.1 lane kilometres per square km of land area. During the 2020 road inspection program, an overall Pavement Condition Index (PCI) on a 0 (failed) to 100 (excellent) scale was calculated by combining the Surface Distress Index (SDI), the Roughness Condition Index (RCI), and the Structural Adequacy Index (SAI) with a 50 %, 40 % and 10 % weight, respectively.
Technical	**Scope:** See **Appendix B** for map of current pavement conditions.
	Quality: The average Pavement Condition Index for Town of Tillsonburg owned roads is 65.9, which falls slightly into the "Fair" category. This level of service is being maintained at the current funding rate. See **Appendix C** for images of pavement condition categories.

Table 22. Road Network – Current Performance Levels

Current Performance	Ontario Regulation 239/02 specifies the Minimum Maintenance Standards for Municipal Highways. It covers such items as, but not limited to, patrolling frequency, snow accumulation, potholes and regulatory/warning signs and traffic signals. Patrol and maintenance activities are tracked through a maintenance management work order system, which is available on desktop and mobile devices. The patrol module captures real-time road surface conditions, and the work order module automatically informs the appropriate staff of deficiencies that require further attention.	
Asset Life-cycle Activities	**Asphalt Surfaces**	• Pothole repairs • Roadside maintenance • Drainage maintenance • Localized patching • Crack sealing
	Sidewalks	• Removal of trip ledges • Localized panel replacement

Risk Strategy

Risk management frameworks are developed to assist with the prioritization of investments within the capital planning period. The preferred approach is to implement a triple bottom line analysis approach to evaluate:

- **Social impacts of asset failure, including impacts to customers, businesses and the Towns reputation;**
- **Environmental impacts of asset failure; and**
- **Economic impacts of failure including the cost of remediation.**

In the context of asset management, risk is the multiple of the consequence of an asset failing and the probability that the event will occur.

Table 25 illustrates the risk ratings for the Tillsonburg **road networ**k at a summary level, as exported from the Town's asset management software system (CityWide). Town staff will monitor the higher risk areas, review and/or complete physical inspections on an annual basis, and plan for life-cycle strategies accordingly.

Table 23. Roads – Current Performance Levels Matrix

Consequence	Likelihood: 1 Rare	2 Unlikely	3 Possible	4 Likely	5 Almost Certain
5 Severe	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4 Major	0 Assets - $0.00	12 Assets 3,188.35m $4,390,827.53	24 Assets 4,082.44m $5,881,966.08	20 Assets 2,485.18m $4,390,827.53	25 Assets 5,634m $6,504,745.11
3 Moderate	7 Assets 1,406.94m $1,174,139.94	27 Assets 5,980.55m $5,234,310.69	33 Assets 3,983.93m $6,504,745.11	16 Assets 1,784.16m $7,780,033.69	47 Assets 8,034.94m $6,906,801.22
2 Minor	40 Assets 6,970.76m $5,274,535.26	84 Assets 12,509.95m $10,638,647.57	151 Assets 18,397.54m $15,655,879.46	97 Assets 14,418.35m $12,224,996.88	134 Assets 22,750.87m $17,586,470.60
1 Slight	3 Assets 202.85m $163,636.72	21 Assets 1,718.44m $1,086,536.60	21 Assets 1,934.10m $1,066,168.00	11 Assets 827.04m $500,041.43	21 Assets 1,929.40m $1,044,074.49

Risk =	Very Low	Low	Moderate	High	Extreme

Life-cycle Options Analysis

Asset life-cycle analysis is utilized to help develop a strategy that can be applied throughout the life of an asset to assist in the development of both short-term capital plans and long-range sustainability plans to ensure the best overall health and performance of

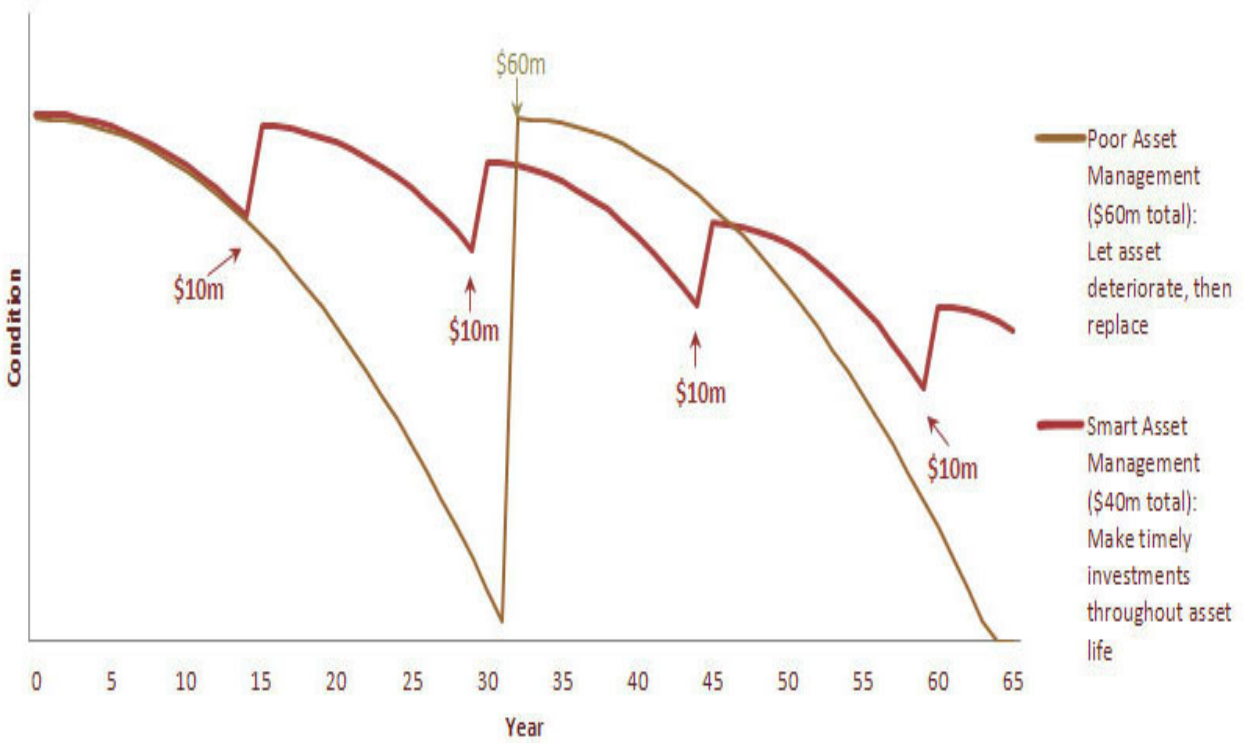


Figure 8. Timely Renewal Investments Save Money. (Source: Building Together: Guide for Municipal Asset Management Plans, Ministry of Infrastructure, 2012)

the Towns infrastructure. The figure below illustrates the importance of timely investments and the effects on the overall cost of a typical asset.

All pavement deteriorates over time. Typically, pavement deteriorates at an ever-increasing rate: at first very few distresses are present and the pavement stays in relatively good condition, but as it ages more distresses develop with each distress making it easier for subsequent distresses to develop. For instance, once a substantial crack occurs it is then easier for water to (1) infiltrate the HMA layer and (2) penetrate and weaken the subgrade. Additionally, freeze-thaw problems in the crack may develop and any expansive materials that get into the crack (such as dirt, sand or weeds) may make the crack even wider thus compounding the previous problems.

Pavement deterioration is non-linear such that initially in the first few years of service the rate of deterioration is slow. At mid service life the rate of deterioration increases and near the end of its service life the rate of deterioration is quite rapid. The following diagram illustrates generalized pavement degradation profiles.

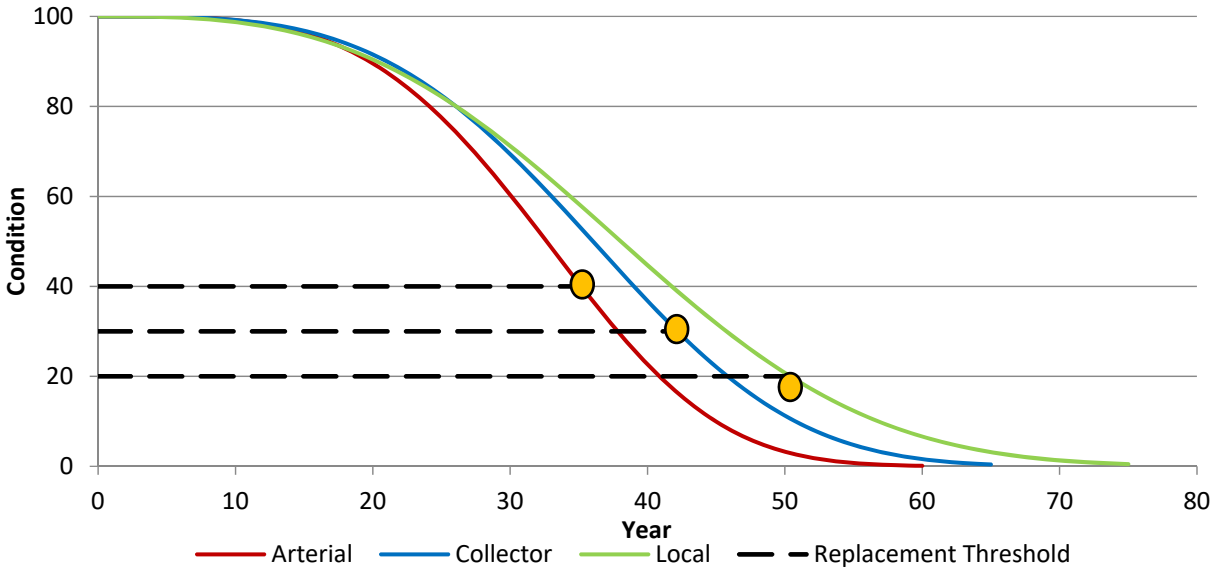


Figure 9. Pavement Degradation Profiles

During a road's life-cycle there are opportunities available for work activity to extend the life of the asset which generally coincides with the assets condition. Trigger thresholds used for identifying rehabilitation and reconstruction needs are provided in **Table 26**. Adjusting the asset condition trigger thresholds also adjusts the level of service and ultimately changes the required investment.

In general, maintenance can slow the rate of deterioration by correcting small pavement defects before they can worsen and contribute to further defects. Beyond a certain point, however, defects become too large for correction by mere maintenance. At this point, rehabilitation can be used to effect a wholesale correction of a large number of relatively severe defects, which provides a step increase in pavement condition.

The maintenance option of crack sealing will be performed on a regular basis moving forward. This maintenance activity is proven to prevent water from entering the pavement and subgrade through open cracks, which slows future deterioration. For rehabilitation and reconstruction activities, if one of the rehabilitation or reconstruction options is carried out on a road section, then the road service life will be extended corresponding to the treatment as summarized in **Table 25**. Therefore, any one of the rehabilitation options may be implemented for individual road sections within the window of opportunity according to the current road condition

Table 24. Road Treatment Options

	Activity	Condition Trigger Threshold (PCI)			Cost (2021 dollars)
		Arterial	Collector	Local	
Maintenance, Rehabilitation and Reconstruction Options	Crack Seal	90 - 75	90 - 75	90 - 75	$1.87/m
	Partial Depth (Top Layer)	55 - 40	50 - 30	45 - 20	$32.95/m^2
	Full Depth (Surface & Base Layers) with spot curb and gutter repairs	55 - 40	50 - 30	45 - 20	$48.89/m^2
	Reconstruction	< 40	< 30	< 20	$120.95/m2

Table 25. Roadway Extended Repair Life and Cost

	ARTERIAL		COLLECTOR		LOCAL / ALLEY		
Activity	**Added Life (Years)**	**Cost/Year/M²**	**Added Life (Years)**	**Cost/Year/M²**	**Added Life (Years)**	**Cost/Year/M²**	**Average Cost/Year**
Partial Depth (Top Layer)	10	$3.30	13	$2.53	15	$2.20	$2.68
Full Depth (Top & Bottom Layers) with spot curb and gutter repairs	15	$3.26	20	$2.44	25	$1.96	$2.55
Full Reconstruct	35	$3.46	42	$2.88	50	$2.42	$2.92

Goal: To preserve the roadway network with the goal of protecting public safety, health, property, and the natural environment while meeting or exceeding all legislative requirements to move people, goods and services safely, efficiently, and effectively that will enable sustainable community growth and economic development.

Objective:

- Maintain all arterial and collector roadways in a Fair to Good condition vs. performance rating with a minimum pavement condition index (PCI) of 50
- Within 10 years improve all local roadways to a minimum Fair condition vs. performance rating

The following strategy for roadways has been developed as a proactive approach to managing the life-cycle of paved roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost. The curve in **Figure 9** was developed using the Local road class to illustrate the effect of the strategy on the extended useful life of a road when the strategy is implemented.

Table 26. Roadway Life-Cycle Strategy

Local Paved Roads			
Age at Event	**Event**	**Event Trigger**	**Impact**
40 Years	Full Depth Rehabilitation (Top and Bottom Asphalt Layers)	20 to 45 Condition Rating	Adds 25 Years
65 Years	Full Depth Rehabilitation (Top and Bottom Asphalt Layers)	20 to 45 Condition Rating	Adds 25 Years
92.5 Years	Replacement	15 to 19 Condition Rating	Set to 100 Condition

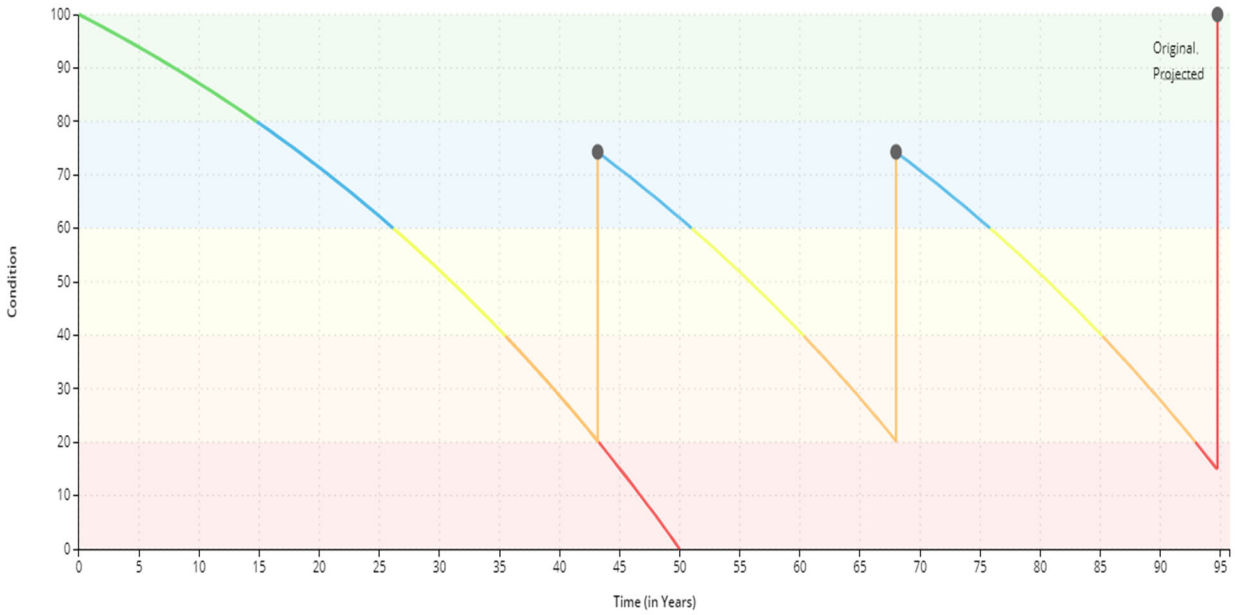


Figure 10. Roadway Life-Cycle Strategy Curve

Storm Network

Storm Network - State of the Local Infrastructure

Table 27. Storm Network Inventory

Asset Type	Length (km)	Count
Mains	82.4	
Manholes		1219
Catchbasins		2716
Catchbasin Leads	27.6	
Services (PDC)	23.1	
Ponds		17

Table 28. Storm Network - State of the Local Infrastructure

Replacement Value	$51,643,070
Average Age	27 years
Current Condition	Excellent: 29%, Good: 29%, Fair: 26% Poor: 14%, Critical: 2% Current condition is based on age. (% remaining service life) See **Appendix E**
Data Sources	**1:** Part 1 of a 2 part Maintenance Hole Condition Assessment project completed in 2020 by Andrews Engineering. **2:** GIS data.

Table 29. Storm Network – Current Levels of Service

Community	Description, which may include maps, of the areas of the municipality that are protected from flooding. See **Appendix D** for flood mapping provided which includes flood lines obtained from Conservation Authorities having jurisdiction. Map includes properties resilient to the 100 year and 5 year storms.	
Technical	Percentage of properties in the municipality resilient to a 100-year storm. $\frac{\text{\# of resilient properties}}{\text{Total \# of properties}}$ = % of resilient properties **Results: 9354 resilient properties = 99.5%** **9648 total properties** Percentage of properties in the municipality resilient to a 5-year storm. **Results: 118 resilient properties = 1.2%** **9648 total properties**	
Asset Life-cycle Activities	Collection Pipes	• Localized repair of mains or leads • Cleaning and flushing • Calcite, roots and other debris removal
	Manholes & Inlet Structures	• Sediment removal • Frame and grate replacement • Manhole benching repairs • Vegetation maintenance
	SWM Facilities	• Access maintenance • Debris and litter control • Dredging and sediment removal

Risk Strategy

Figure 15 illustrates the risk ratings for the Tillsonburg storm network at a summary level, as exported from the Town's asset management software. (CityWide). Town staff will monitor the higher risk areas, review and/or complete physical inspections to validate the age-based condition ratings basis, and plan for life-cycle strategies accordingly.

Table 30. Storm Network Risk Profile

Consequence	Likelihood: 1 Rare	2 Unlikely	3 Possible	4 Likely	5 Almost Certain
5 Severe	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4 Major	0 Assets - $0.00	2 Assets 288.23m $349,675.85	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
3 Moderate	24 Assets 1,482.64m $1,247,181.70	38 Assets 3,622.58m $2,865,525.65	32 Assets 2,899.23m $2,264,049.13	14 Assets 1,328.96m $957,020.51	0 Assets - $0.00
2 Minor	194 Assets 11,688.06m $5,299,983.30	216 Assets 14,488.17m $5,761,846.10	190 Assets 13,472.32m $5,716,399.27	99 Assets 6,589.65m $2,765,514.40	8 Assets 598.88m $17,586,470.60
1 Slight	221 Assets 10,546.28m $2,990,170.08	169 Assets 8,948.24m $2,426,536.36	149 Assets 7,414.07m $2,245,703.86	11 Assets 827.04m $1,453,302.65	9 Assets 360.58m $104,630.47

Risk =	Very Low	Low	Moderate	High	Extreme

Storm Network – Current Performance Levels

The Town stormwater management system follows standard design criteria established under the Drainage Act.

The rate of deterioration of stormwater sewer collection pipes is also non-linear as shown in the figure below, which also illustrates the condition based rehabilitation and replacement trigger thresholds.

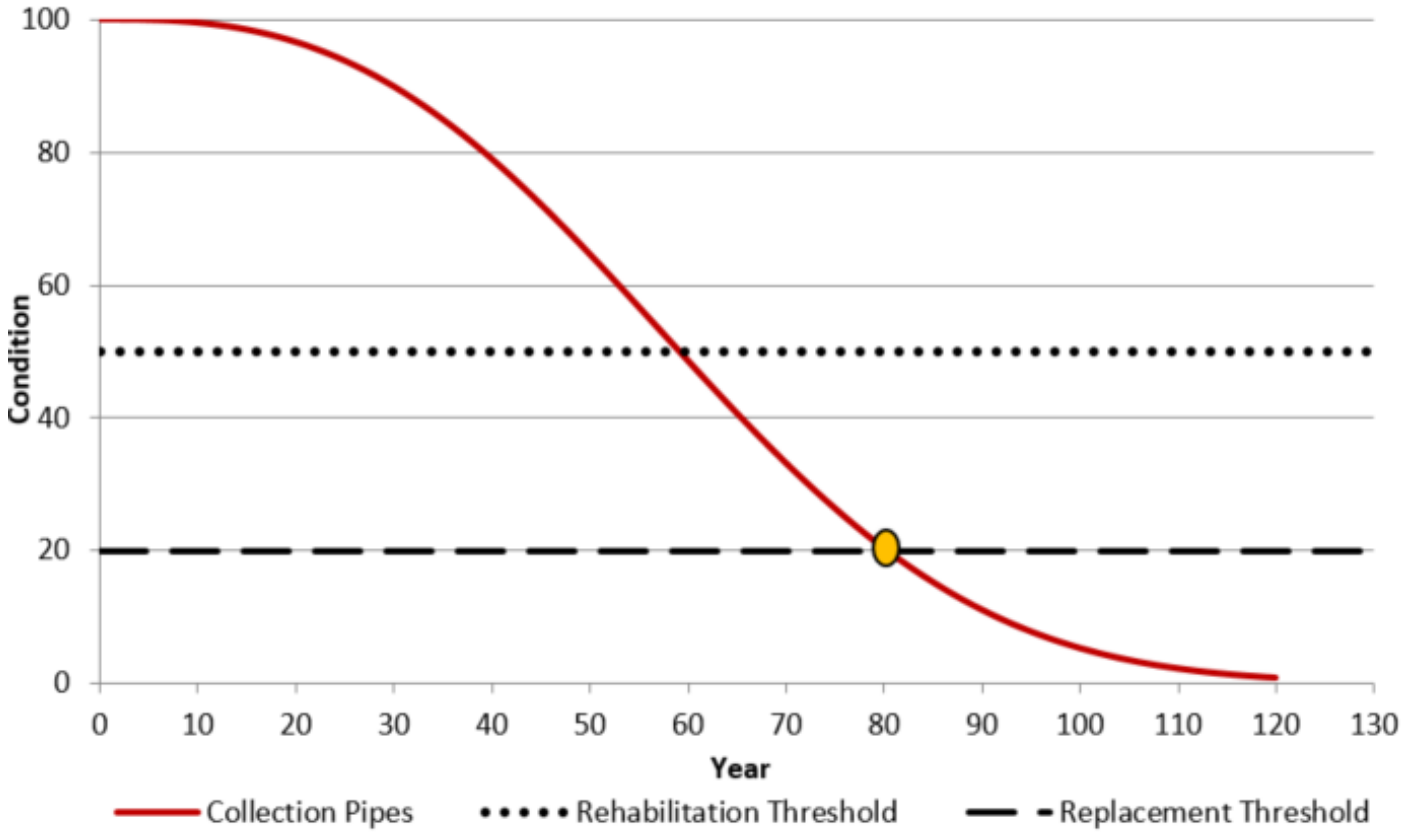


Figure 11. Stormwater Pipe Degradation Profile.

There are two relining strategies the Town is currently exploring, non-structural and structural relining as an effective viable alternative solution for storm sewer rehabilitation. The following figures compare the extended service life for non-structural and structural relining technologies with typical replacement of storm sewers.

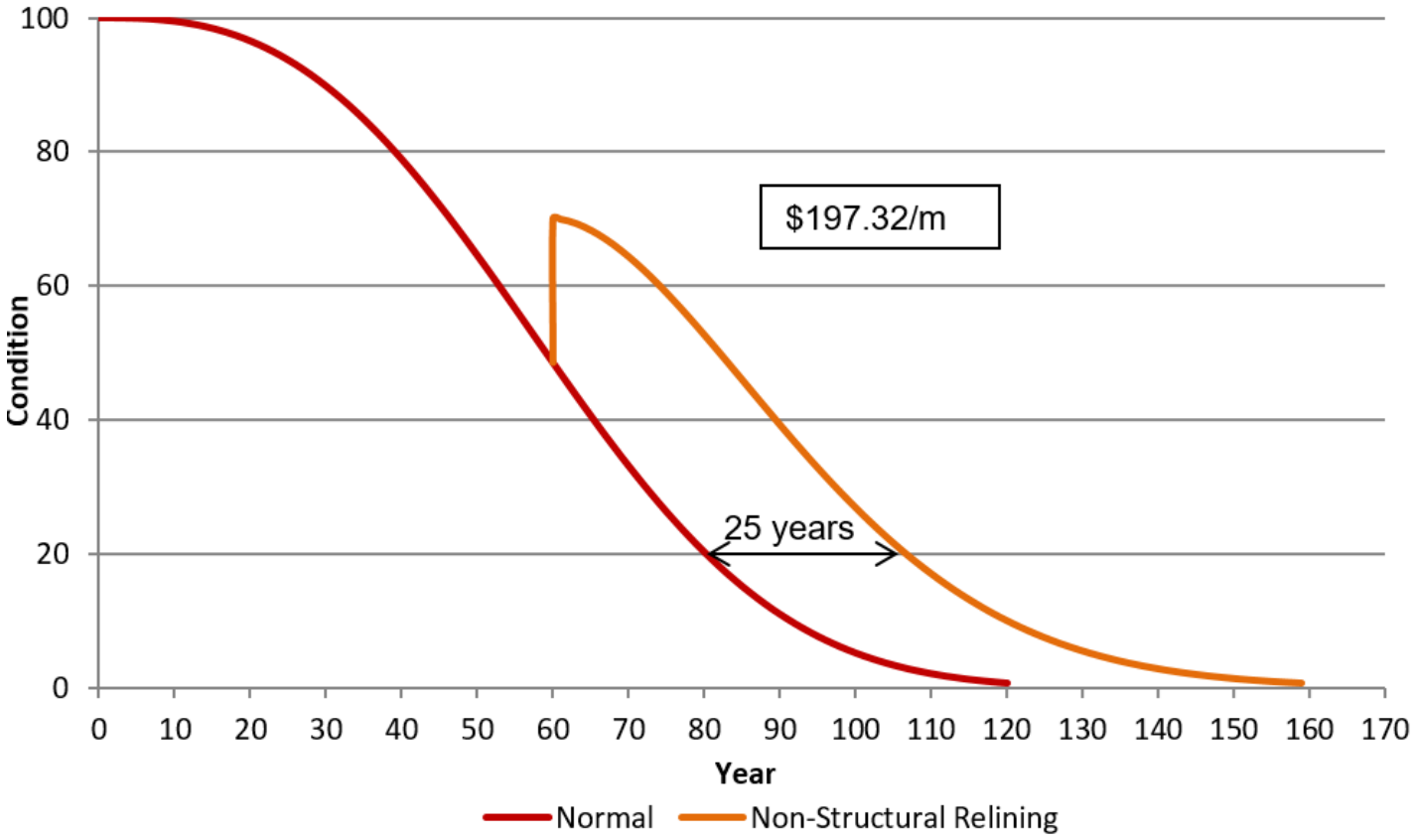


Figure 12. Normal vs. Non-Structural Relining

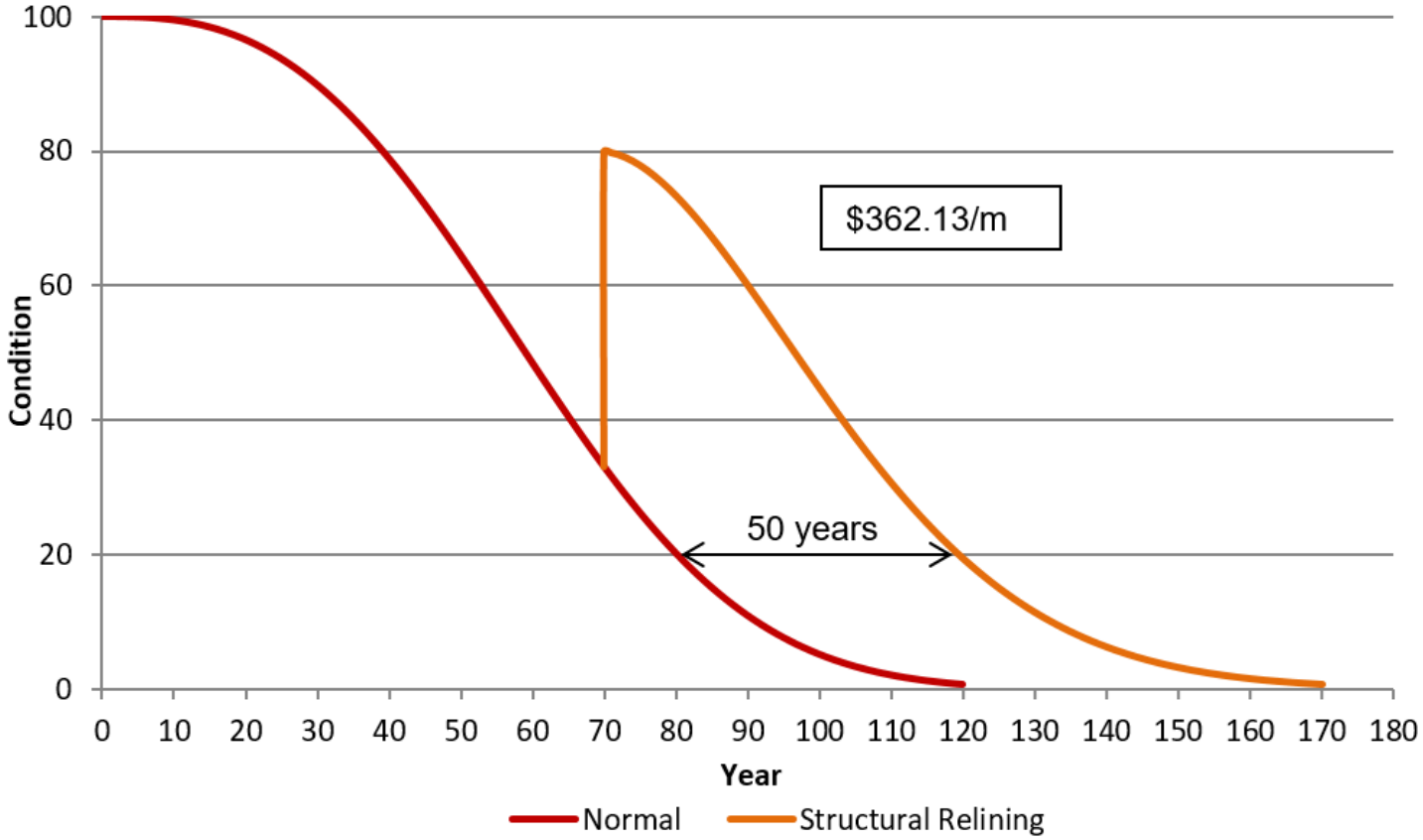


Figure 13. Normal vs. Structural Relining

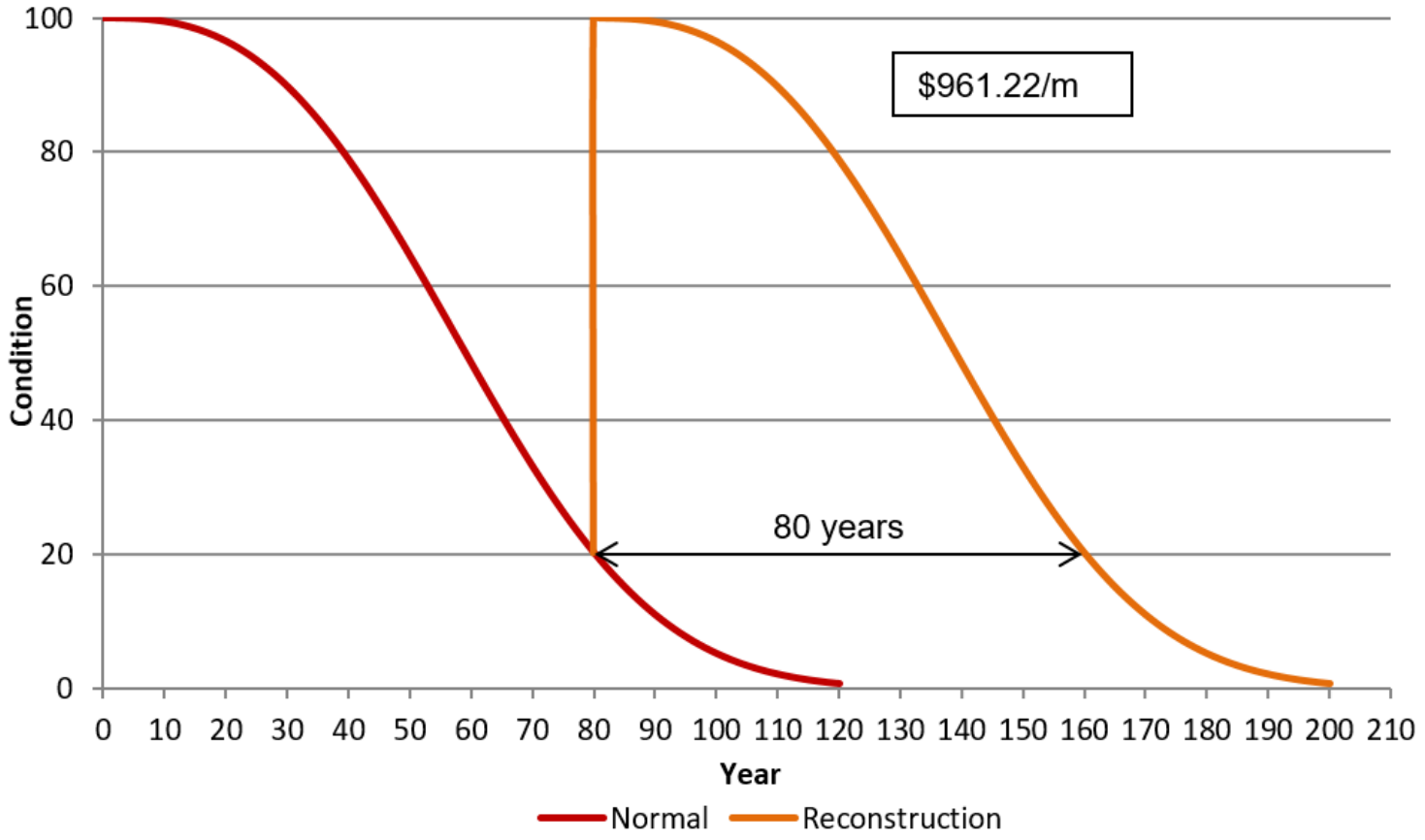


Figure 14. Normal vs. Reconstruction

Table 31. Stormwater Pipe Rehabilitation Strategy Cost Summary

Strategy	Unit Cost per Meter	Extended Service Life (Years)	Unit Cost per Year of Added Life
Non-Structural Relining	$183.62	25	$7.89
Structural Relining	$338.64	50	$7.24
Reconstruction	$961.22	80	$12.02

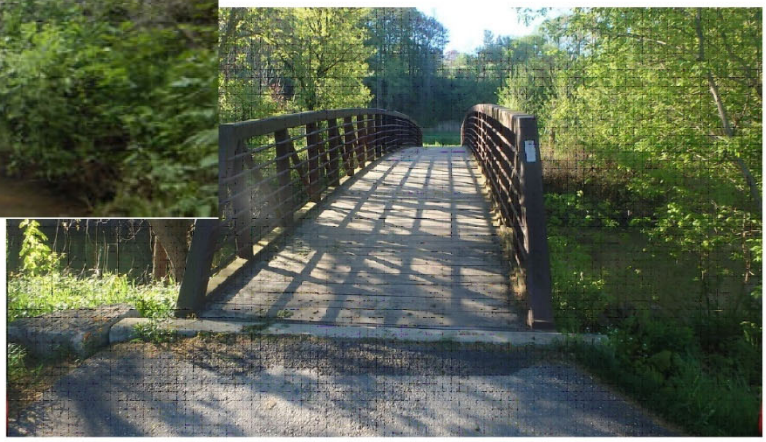
Goal: To preserve the existing stormwater collection and land drainage system with the goal of protecting public safety, health, property, and the natural environment while meeting or exceeding all legislative requirements for stormwater quality and management that will enable sustainable community growth and economic development.

Objective:

- Meet the Ministry of Environment quality requirements for stormwater management for new developments and reconstruction projects.
- Reduce the number of urgent stormwater projects

With these goals and objectives in min, based on the sewer pipe degradation figures and the strategy cost summary in **Table 32**, structural relining appears to be the most economical alternative. However, the application of non-structural relining may also be applied depending on the condition of other street corridor assets in order to facilitate a coordinated full asset reconstruction of the street corridor.

Bridges & Structural Culverts



Bridges and Structural Culverts - State of the Local Infrastructure

For some bridges in Poor condition, a small holding strategy of repairs can be done to extend the life of the bridge by 6 to 10 years. This will defer the major expense of structure replacement, while still maintaining the bridge in a serviceable condition. Some other bridges that are still in Good condition can have work done ahead of other Poor condition bridges to help preserve the bridges before they require extensive repair.

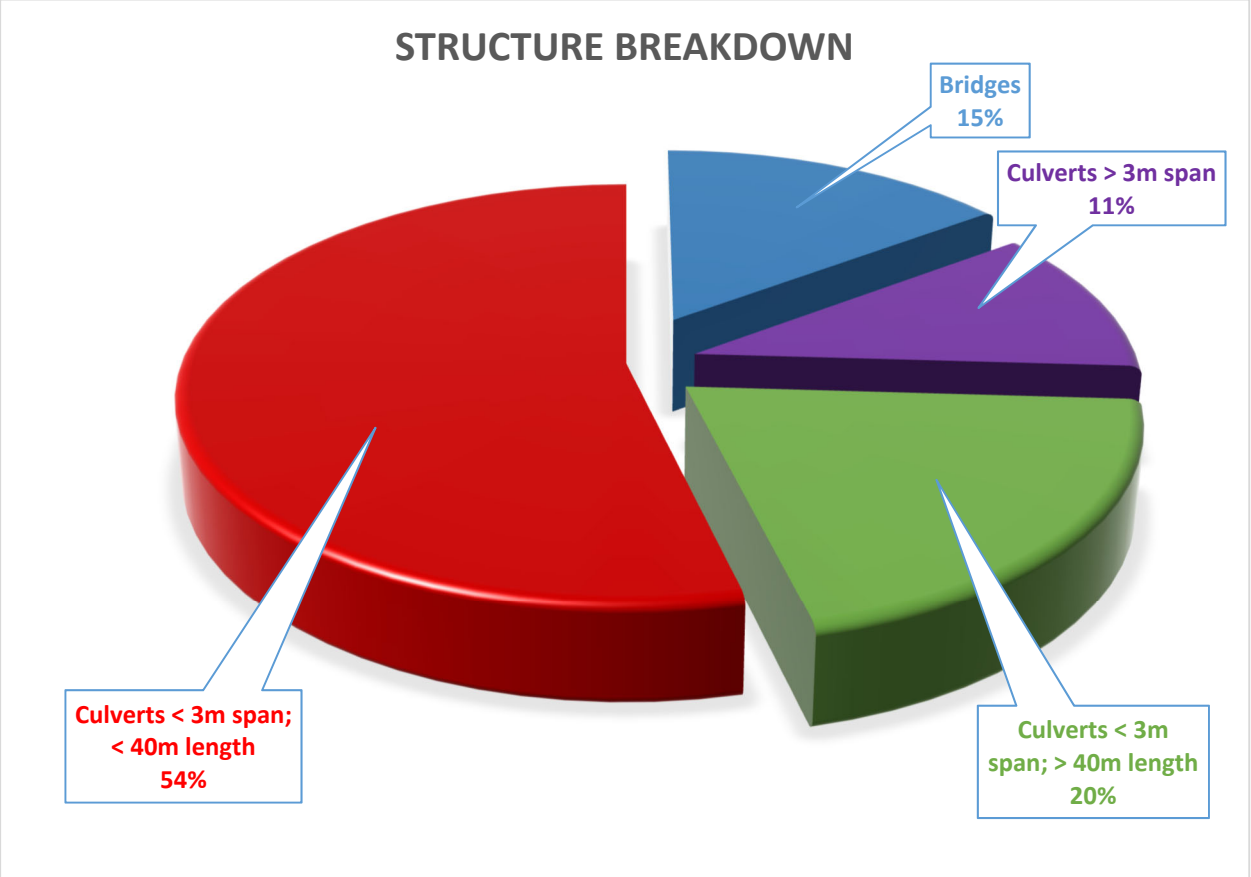


Figure 15. Bridge and Structural Culvert Breakdown

Table 32. Bridges & Culverts – Inventory and Condition

Inventory	8 Bridges, 7 culverts > 3m span,
Replacement Value	Bridges: $12.1m, Structural Culverts: $ 8.7m
Average Age	Bridges: 35 years Culverts: 34 years
Current Condition	Bridges: 7 good, 1 Poor. Structural Culverts: 2 Good, 3 Fair, 2 Poor
Data Sources	1: 2021 OSIM Inspection Reports 2: GIS data 3: Town of Tillsonburg Needs Study prepared by GM BluePlan Engineering.

Table 33. Bridges & Culverts - Current Levels of Service

Community	**Scope:** Description of traffic that is supported by municipal bridges. Heavy transport, busses, farm vehicles, horse and buggies, emergency and private motor vehicles, cyclists, and pedestrians. See **Appendix F** for a map showing bridge and culvert locations **Quality:** Description or images of condition of bridges and culverts and how this would affect the use of these structures See **Appendix G** for images.
Technical	There are no bridges within the municipality with loading or dimensional restrictions.

Table 34. Bridges & Culverts - Current Performance Level

Performance Level	**Current Performance**	Ontario Regulation 104/97 as amended specifies the requirements for a biennial Bridge Needs Study and Ontario Regulation 239/02 specifies the Maintenance standards for Bridge Decks. The detailed biennial Bridge Inspection Report details the performance of the structures within the Town. Tillsonburg is 5% behind the MTO's goal of maintaining at least 80% of its structures with a BCI greater than or equal to 70

Table 35. Bridges & Culverts – Asset Life-cycle Activities

Asset Life-cycle Activities	**Planned Actions On-going Maintenance**	A total of $7,691,000 is the projected capital need for the next 10 years, with the majority of needs falling in the 1-5 year range. The average capital need over the 10-year period is $769,100. Common maintenance includes: ➢ Wearing surface crack sealing ➢ Painting ➢ Washing & Cleaning of: ➢ Wearing surface & deck • Sidewalk & railings • Tops of abutments & piers • Expansion joints • Seats & bearings • Lower chords of trusses • Deck drains • Crack Repairs • Bonding • Routing and sealing • Stitching • Localized rust removal and painting • Sandblasting and repainting *The "Capital Needs Report" was developed in conjunction with the 2021 Biennial Municipal Structure Inspections Report prepared by GM BluePlan Engineering.*

Table 36. Bridge & Structural Culvert Risk Profile

Consequence	Likelihood: 1 Rare	2 Unlikely	3 Possible	4 Likely	5 Almost Certain
5 Severe	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
4 Major	0 Assets - $0.00	2 Assets 288.23m $349,675.85	0 Assets - $0.00	0 Assets - $0.00	0 Assets - $0.00
3 Moderate	24 Assets 1,482.64m $1,247,181.70	38 Assets 3,622.58m $2,865,525.65	32 Assets 2,899.23m $2,264,049.13	14 Assets 1,328.96m $957,020.51	0 Assets - $0.00
2 Minor	194 Assets 11,688.06m $5,299,983.30	216 Assets 14,488.17m $5,761,846.10	190 Assets 13,472.32m $5,716,399.27	99 Assets 6,589.65m $2,765,514.40	8 Assets 598.88m $17,586,470.60
1 Slight	221 Assets 10,546.28m $2,990,170.08	169 Assets 8,948.24m $2,426,536.36	149 Assets 7,414.07m $2,245,703.86	11 Assets 827.04m $1,453,302.65	9 Assets 360.58m $104,630.47

Risk =	Very Low	Low	Moderate	High	Extreme

From the 2021 Capital Needs Report developed by GM BluePlan Engineering: Recommended capital works have been organized based on the proposed time frame specified to complete the tasks. Within the individual OSIM reports, and in accordance with OSIM format, capital works have been divided into the following time frames: urgent, within 1 year, 1 to 5 years, and 6 to 10 years. Recommended capital works for each structure were evaluated in a manner that would provide the Town with the greatest net present value for the structure when comparing rehabilitation or replacement (where applicable). The results of the Bridge, Culvert, and Retaining Wall Inspections, using criteria set out in OSIM, are as follows:

Table 37. Bridge & Culvert Maintenance Time Frame

Time Frame	Urgent	Within 1 Year	1 to 5 Years	6 to 10 Years
# of Structures Requiring Work	1	1	7	5
Total Estimated Recommended Capital Works	$186,000	$745,000	$4,974,000	1,786,000

It should also be noted that prioritization and recommended timing of works have been scheduled in accordance with OSIM guidelines and engineering judgment. The Town may wish to adjust the timing of some projects to align the construction with other anticipated capital projects (i.e. road resurfacing projects, road reconstruction projects, etc.), or with available funding

Table 38. Bridge & Culvert Condition Breakdown

Structure Type	Total	Bridge Condition Index Range				
		<40	40-50	50-60	60-70	70-80
Bridge	8	0	1	0	1	6
		0.0%	12.5%	0.0%	12.5%	75%
Culvert	7	0	1	1	3	2
		0.0%	14.3%	14.3%	42.9%	28.6%

Goal: To preserve the existing bridge network with the goal of protecting public safety, health, property, and the natural environment while meeting or exceeding all legislative requirements that will enable sustainable community growth and economic development.

Objective:

- Maintain all bridges, culverts, and retaining structures in a Fair to Good condition vs. performance rating with a minimum bridge sufficiency index (BSI) of 60.
- Within 10 years improve all bridge, culvert, or retaining structures to a minimum Good condition vs performance rating.

5. ASSET MANAGEMENT STRATEGY

The Town of Tillsonburg provides a variety of services to the community, which require responsible operation, maintenance, rehabilitation and eventual disposal. This Asset Management Strategy provides a documented plan that presents the objectives, practices and the actions we will take when delivering services to our customers. Municipal services from infrastructure include stormwater, facilities, roads, bridges, sidewalks, street lights, signalized intersections, airport, parks, vehicles, and equipment. These assets have a current replacement value of $320 million, excluding land, as it does not deteriorate with age and it is assumed to have an unlimited useful life. Therefore, a replacement value for land is not included.

The AM strategy describes the key practices, processes, tools and documents that staff will use to implement the AM policy and ensure adherence to its principles. The strategy can drive real and tangible improvements in evidence-based decision-making and will enable more reliable financial forecasting and planning.

The purpose of the asset management strategy is to help realize the Town of Tillsonburg's vision of being connected, enriched, and inspired. The Asset Management Strategy will map the Town's approach to implementing and embedding asset management as a core business practice, and outlines the organization's approach for implementing the asset management policy. It will aid in ensuring that the Town provide services needed by the community in a financially sustainable manner. All assets have a useful service life and it is vital that these assets are managed carefully in order to maintain the required level of service in the most cost-effective manner.

By adopting effective asset management processes, including asset management policies, strategies, and plans the Town of Tillsonburg will realize internal benefits such as:

- Supported sustainability of service;
- Enhanced financial performance;
- Assessment and management of risk;
- Meeting and promoting customer service needs, resulting in customer satisfaction;
- Supporting economic activity and promoting a satisfying lifestyle;

The asset management framework, which incorporates all asset management processes will aid in:

- Establishing and implementing best practices for the efficient delivery of services
- Making timely investments in infrastructure to minimize asset life-cycle cost
- Lowering overall cost of asset ownership
- Prioritizing projects based on measurable City-wide benefit criteria
- Improving asset data leading to better decision making

Asset Management Model

The Institute of Asset Management Model, which is constructed in line with the ISO55000 standard in mind, is broken down into the following 6 areas:

- Strategy and Planning
- Asset management decision making
- Life cycle delivery
- Asset information
- Organization and people
- Risk and review.

The figure below shows how the strategy is a component of the entire Asset Management Plan.

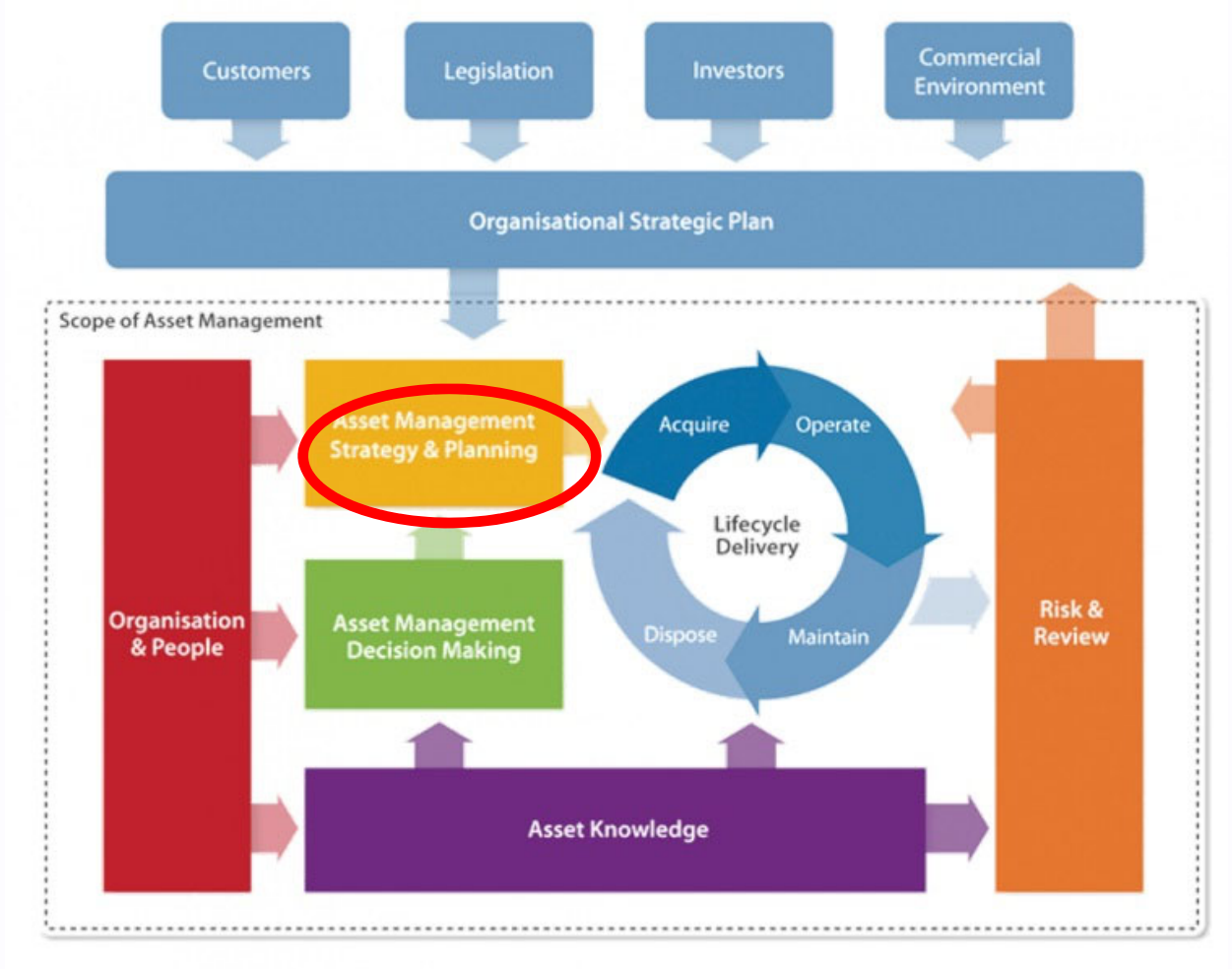


Figure 16. Scope of Asset Management

AM Strategy Elements

- Scope and applicability of the AM system (assets and departments to which they apply)
- Business context (including stakeholder needs and expectations)
- AM decision-making approaches.
- AM objectives and performance target.
- Key AM improvement initiatives.
- AM roles and responsibilities.
- Risks to the AM strategy, and monitoring and evaluation

Actions (How we put things into practice)

- Setting appropriate levels of service: Establishing both customer and technical levels of service begins with decisions made in the planning stage and continues through the life-cycle of the asset. Levels of service targets should be informed by affordability and public willingness to pay.
- Managing risk:

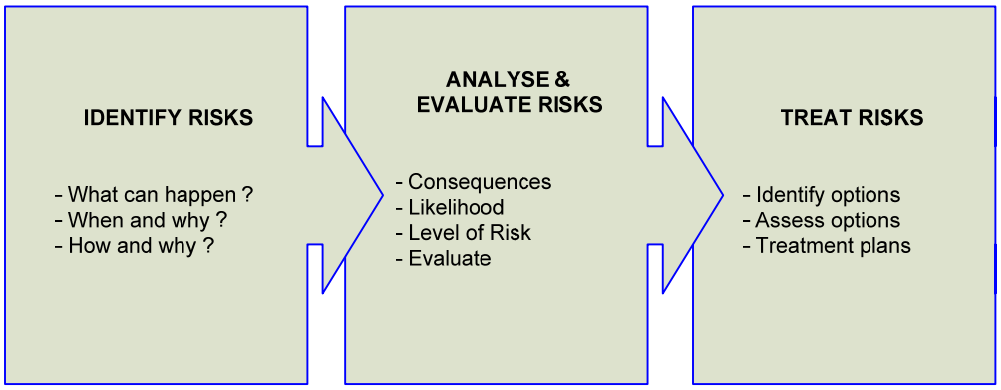


Figure 17. Managing Risk

- Considering full life-cycle costs: An understanding of the full life-cycles costs of assets should be used to inform decisions throughout the asset life-cycle
- Proactive and effective operations and maintenance: A robust and optimized O&M program will result in fewer service disruptions, more predictable results, and lower total life-cycle costs when informed decisions are made about when to apply proactive vs. reactive maintenance and renewal.

Guiding Principles

- Developing a systematic approach to asset management: This will ensure consistency across the organization. Everyone should be aware of their role and working toward a common goal, which is the delivery of reliable services.

- Establishing customer and corporate levels of service: It is important to establish reasonable expectations between the service that can be provided, the level that can be afforded and the risk that can be tolerated.
- Using Criticality and Risk Management: Identifying the importance of different assets in supporting the delivery of services provides the ability to determine the likelihood of an asset failing, and the consequence of the failure. In other words, if an asset fails, what is the impact on the customer, the budget, the environment, and the Town's reputation?
- Considering asset resiliency: How assets are planned and built, rehabilitated or improved, provides an ability to adapt to changing demographics, changing climate, changing population, or changing standards.
- Sourcing service delivery and funding opportunities: Available funding sources have an impact on the quantity and quality of assets being built, acquired or rehabilitated.
- Promoting staff development: Many Town staff have a role to play in the management of corporate assets through planning, finance, engineering, operations, and maintenance. The ability of recruit, train, develop and retain staff is crucial to the efficient management of corporate assets.
- Providing asset reporting: Asset condition information needs to be communicated in order to make sound investment decisions.
- Developing complete and accurate asset data repositories: Asset data supports investment decisions and improves monitoring of performance against established levels of service.
- Leveraging technology: This enables staff to perform their duties in an efficient manner.
- Fostering continual improvement and innovation: This allows continued support of reliable delivery of service to customers.
- Conducting asset management performance measurement activities: This will assist in confirming that the corporation is delivering on its commitments.

Strategies

Asset Life Cycle Management Strategy:

An integrated approach to optimizing the life cycle of assets beginning at conceptual design, continuing through shut down and decommissioning. Most of the Town's physical assets are long lived assets having service lives lasting several decades. As a result, infrastructure related decisions have a lasting impact. These decisions need to be made looking at the life-cycle or whole life of the assets in conjunction with risk and Level of Service.

Figure 18. Asset Life-cycle Management

Operational and Maintenance Strategy:

Well-planned and executed operations allow local governments to deliver their services efficiently, effectively, and economically. Continuous improvement of O&M activities is a key component of the asset management process. O&M practices can significantly impact asset life-cycle costs, management of risk, and service delivery performance. Asset portfolios should be based on both existing asset requirements and forecasted growth by assessing consequential operational and maintenance requirements. Preservation of an asset is an important aspect in any asset management strategy, especially considering continuous fiscal constraints. The design life of an asset is often dependent on achieving a minimum level of maintenance to protect the capital investment of the asset. Early detection of potential issues is crucial to determine and evaluate maintenance and rehabilitation alternatives and is largely accomplished through ongoing condition assessments and inspections.

Asset Management Decision Making Strategy:

Asset life-cycle is characterized as a series of decisions, which makes asset management decision-making one of the most important asset management activities. The process of deriving value from assets is a result of optimized asset management decisions made over the asset's life cycle. Asset management decision-making can therefore be thought of as the strategic manipulation of asset information to determine the optimal mix of

financial and non-financial strategies to enable the asset portfolio to deliver the asset management objectives of the organization.

Decision making needs to be strategically managed, and should include the following steps:

- Identifying the types of decisions that are needed to be made over the asset's life cycle.
- Developing a risk-based, value-based decision-making framework that includes criteria and processes.
- Establishing the monitoring and review processes that will support continuous improvement.

Data Management Strategy:

Data must be treated as a strategic asset that is trusted and relied upon to serve its intended purpose to stakeholders. As with other assets, a management strategy is needed to ensure the quality and consistency of this service. Effective data management includes asset inventory data review and validation to ensure that asset management planning and decision-making is based on the best available data on municipal infrastructure.

Levels of Service Strategy:

One of the most important responsibilities of a municipality has always been the delivery of services to the public. These services include the installation, maintenance, and eventual replacement of infrastructure. It is important to define and quantify the Level of Service within each service area, as these become the driver for the identification of asset needs and the basis for investment decisions.

Risk Management Strategy:

Municipal infrastructure is the foundation that the daily life of Canadians is built upon, and the strength of this foundation enables communities and local businesses to grow, and ensures Canadians have a high quality of life. A risk-based approach to assessment and mitigation of asset risks will enable the Town to manage its assets with due regard to risk. Through the process of risk identification, analysis, ranking, and monitoring and reviewing, the organization can manage risks that pose unacceptable conditions, as well as acceptable opportunities (positive risk) to the organization and advance plans to address them.

6. RISK EVALUATION OF ASSET MANAGEMENT STRATEGY

The Town of Tillsonburg Asset Management Strategy is founded on available data, anticipated service levels, and other assumptions. Assumptions in these items introduce some unavoidable risk that the overall strategy may change over time as the Town evolves and develops more complete data and processes. Recognizing these uncertainties, Tillsonburg is developing strategies to address each source of risk so that the Asset Management Strategy can evolve over time. Risk mitigation strategies for each of the following are discussed below:

- Data Quality: As with any data-intensive quantitative analysis, the results are only as good as the data that it is based on. The Town recognizes that there are some gaps in the datasets used for the development of the asset management plan that may impact the validity of the results.
- Strategy to Address: Since early 2019, town staff have been working diligently to update the GIS database which contains location and attribute data for all Town of Tillsonburg core assets. It is recommended that in-field data collection and assessments continue to be conducted to ensure the inventory of assets is complete along with their current physical condition. With updated information the asset management strategies should be reviewed to determine if any significant changes are required.
- Levels of Service: The levels of service present a risk, since levels of service have not been established for the Town. The level of service performance indicators have never been measured before and the expectations of each level of service has not been established. Adjustment is expected in the early years of levels of service to better reflect the level of commitment from the municipality, but risk exists if a level of service is set at higher expectations than what is possible at the current levels of funding.
- Strategy to Address: It is suggested that to address this source of risk, the targets established in the first year of utilizing the Levels of Service should be reviewed along with the cost to provide the levels of service. If the cost of the level of service is too high to maintain the target should be adjusted or alternative strategies to accomplish the level of service should be investigated.
- Life-cycle Consequences: Life-cycle consequences represent the anticipated outcomes in the event that the municipality does not undertake the recommended asset management activities during the recommended timeframes. Life-cycle consequences can be included but are not limited to deterioration of the physical condition of the asset, a reduction in the outputs and service potential of the assets, increased operating costs, higher costs for subsequent asset management activities than would otherwise have been incurred had the Town undertaken the recommended asset management activities and/or a reduction in the estimated useful life of the asset.
- Strategy to Address: It is suggested that future budgets be tied directly to the asset management strategy highlighting the impact that spending decisions have on the condition, useful life, maintenance costs, and future rehabilitation funding needs

as well as the potential impact to levels of service and associated degrees of risk and liability.

- Assumptions: As with any assumption, risk exists if that assumption does not account for a large enough percentage of the assets that could potentially result in unexpected costs if not corrected (i.e. year of installation assumed, when the asset is past its expected useful life, and due to the degradation of the asset, affects surrounding assets.)
- Strategy to Address: It is suggested that through the asset inspection programs the largest assumptions be mitigated and asset management strategy revised, if required.

7. FINANCE STRATEGIES

Overview: Several financing strategies are available for the funding of capital projects, which are utilized on a project by project basis. The typical financing strategies include:

- Pay as you go: Saving all funds in advance of building or acquiring an asset. This strategy is long range in nature and sometimes requires foregoing needs in the short term until enough capital has been saved to carry out the required project.
- Reserve Accounts: Contributing revenues to a reserve account, and drawing funds from the account. This strategy allows a reserve 'threshold' to be set to provide a buffer for unexpected expenditures. It also allows life-cycle contributions to be made on an annual basis, which can be drawn upon when needed.
- Debenture Financing: A loan issued to the organization for building or acquiring an asset, which involves repayment annually with interest. The Province has limits on the total amount of debt, which is based on an Annual Payment Limit or 25% of the municipality's source revenue.
- Development charges: One-time fees paid by developers issued to help pay for municipal services to new developments, such as roads, transit, water and sewer infrastructure, community centres and fire and police facilities. They are used to recover the capital costs associated with residential and non-residential growth within the municipality, and ease the financial burden on existing taxpayers to fund new services as a result of growth. Without development charges, the costs for additional infrastructure would be at the expense of existing property owners in the form of higher property taxes and user fees.
- Third-Party Contributions: Contributions from parties external to the organization. This typically comes from contributions, subsidies or grants from senior levels of government, such as the Federal Gas Tax, the Ontario Community Infrastructure Fund, etc.

In reality, the Town utilizes a combination of the above funding strategies to meet its needs, depending on the specific project situation. Overall though, underground infrastructure, which can be fully functional for 80+ years and often out of sight and out of mind, has historically received investments below the life-cycle requirements, resulting in a steadily increasing backlog of deferred maintenance and capital expenditures.

In the event that the AMP identifies funding shortfalls in any of the asset categories, the Building Together Guide, and specifically Ontario Regulation 588/17, requires by July 1, 2025, that the AMP indicate the impacts of the shortfall and how the impact will be managed. The action plan may include any of the following approaches:

- Reduce levels of service which will effectively reduce the funding requirement;
- Employ asset management methodologies to apply the right treatment to the right asset at the right time, which has been found to lower the overall lifecycle costs;
- Employ financial strategies that may include, but not limited to:

    1. Reducing single source reliance – two-thirds of total revenue from property tax and less than one fifth from fees, charges, permits and fines may not be sustainable long-term
    2. Look to setting cost-recovery targets for various program. For example, set recreation programs to 40% to enable reinvestment and variety, where 10-year average has been 27%. Whatever tax room is freed up by moving certain services to user-pay to be absorbed by increasing infrastructure investment
    3. Make strategic use of debt by focusing it on longer-term assets; and
    4. Formalize up to a 1% infrastructure revitalization levy to facilitate the scale of investment called for in the AMP

When evaluating asset funding requirements and shortfalls, it is important to consider intergenerational equity, which refers to the fairness between generations. From an asset perspective, this speaks to who should pay for the assets that have long term benefits. For assets such as fleet and equipment with short useful lives, 10 years or less, the current generation receives the full benefit of the asset and should be responsible for the asset's financing. For assets with longer lives, multiple generations will receive the benefit and establishing fairness for the asset financing is more difficult.

Annual Requirement (refer to tables 1 & 2)

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs at the end of an assets useful life. For core asset categories the annual requirement is calculated based on total replacement costs at the end of their service life based on 2021 dollars.

10-Year Capital Budget

In its 2021-2030 Strategic Plan, the Town's priority projects include the development of a multi-year budgeting framework, along with a financial and environmental sustainability plan. Beginning with the 2023 fiscal year, the implementation of a corporate-wide 10-year capital budget informed by the asset management plan and asset management activities will provide a snapshot of a broader planning horizon, improving the perspective and awareness of future projects outside of traditional short-term plans.

The Town of Tillsonburg will need to implement a comprehensive financial plan that will allow it to fund the repair, rehabilitation and reconstruction of its asset base as it deteriorates and breaks down. It should be noted that the values outlined in this Section only relate to the existing asset base and serviced population. Future growth and expansion projects will need to be financed on their own schedule with additional sources of funding in addition to those put into place for long-term replacement.

8. GROWTH AND DEMAND

Population growth has an impact on municipal infrastructure and services, and therefore it is important to plan for forecasted population growth. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth the Town will need to review the life-cycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to at a minimum, maintain the current level of service. Population changes will require the municipality to determine the impact to expected levels of service and if any changes to the existing asset inventory are required.

Table 40 & 41 were extracted from the 2020 County of Oxford Phase One Comprehensive Review, which includes County-wide and Area Municipal population, household and employment forecasts, and a land need analysis. The forecasted 10-year growth from 2016 – 2026 is 12%, and 2026 – 2036 is 10.7%.

Table 39. Forecasted Population - Households

Year	Population (Excluding Undercount)	Population[1]	Households					PPU
			Singles	Semis	Multiples (Rows)	Apartments	Total Residential	
2016	15,870	16,310	4,850	280	350	1,650	7,130	2.19
2021	16,910	17,380	5,210	280	380	1,770	7,640	2.17
2026	17,780	18,280	5,480	290	410	1,860	8,050	2.17
2031	18,720	19,240	5,750	300	450	1,950	8,450	2.18
2036	19,690	20,200	6,010	310	490	2,040	8,850	2.18
2041	20,630	21,220	6,230	320	530	2,130	9,200	2.20
2046	21,530	22,150	6,450	330	560	2,200	9,540	2.22
2016-2036	**3,820**	**3,890**	**1,160**	**30**	**140**	**390**	**1,720**	
2016-2046	**5,660**	**5,840**	**1,600**	**50**	**210**	**550**	**2,410**	

Source: Hemson Consulting Ltd., 2020

1. Forecast population includes a net Census undercount of approximately 2.7%

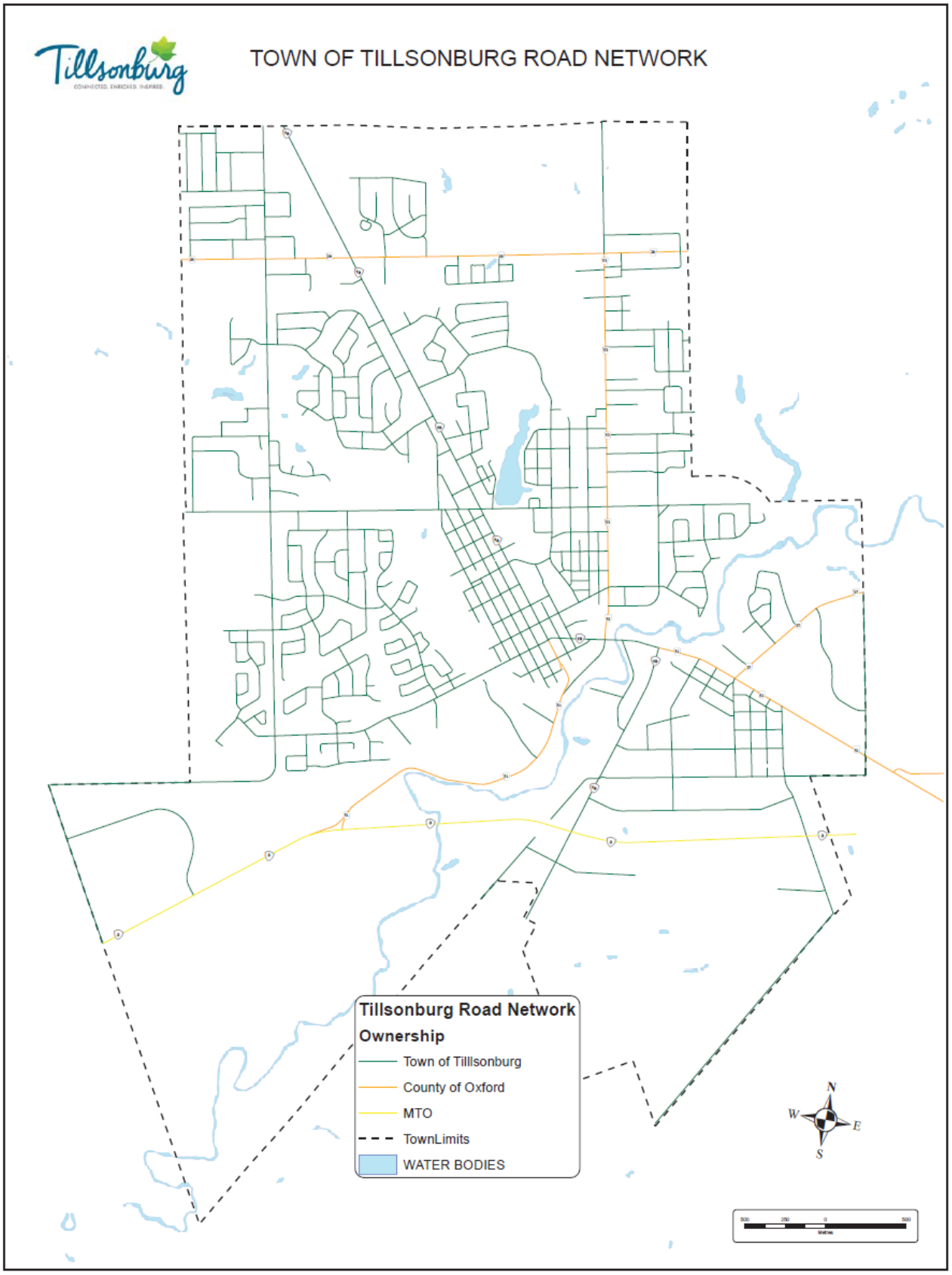
Table 40. Forecasted Population – Employment

Period	Population (Excluding Undercount)	Population[1]	Activity Rate	Employment			
				Population Related Employment	Employment Land Employment	Rural Based Employment	Total Employment
2016	15,870	16,310	54.1%	3,410	5,170	0	8,580
2021	16,910	17,380	53.6%	3,670	5,390	0	9,060
2026	17,780	18,280	52.4%	3,800	5,520	0	9,320
2031	18,720	19,240	51.3%	3,950	5,650	0	9,600
2036	19,690	20,200	50.5%	4,150	5,800	0	9,950
2041	20,630	21,220	50.2%	4,370	5,980	0	10,350
2046	21,530	22,150	50.2%	4,620	6,180	0	10,800
2016-2036	**3,820**	**3,890**		**740**	**630**	**0**	**1,370**
2016-2046	**5,660**	**5,840**		**1,210**	**1,010**	**0**	**2,220**

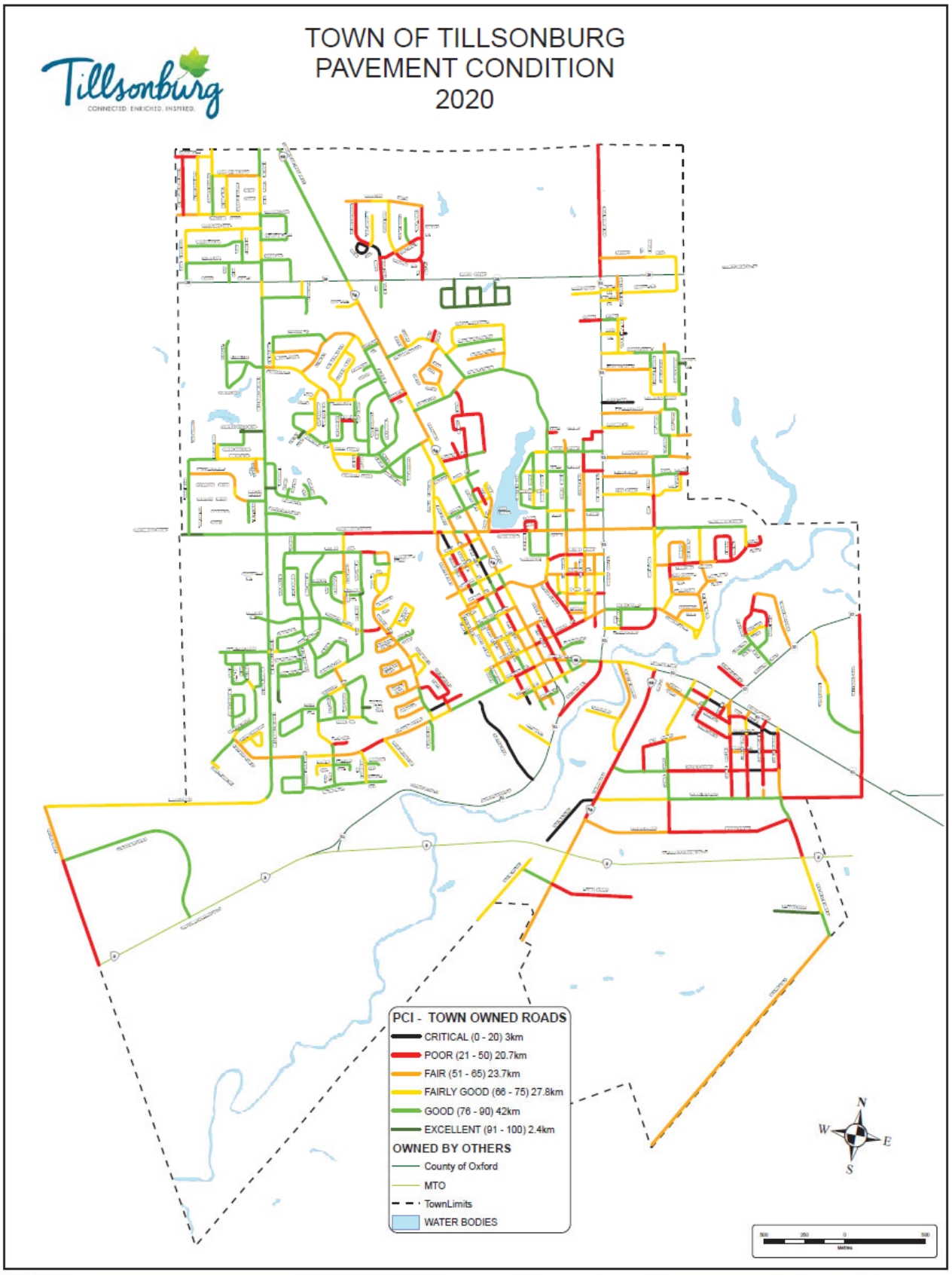
Source: Hemson Consulting Ltd., 2020

1. Forecast population includes a net Census undercount of approximately 2.7%

Appendix A: Road Network by Owner



Appendix B: Road Network Condition



Appendix C: Pavement Condition Images

Pavement Condition Excellent – PCI 86 – 100

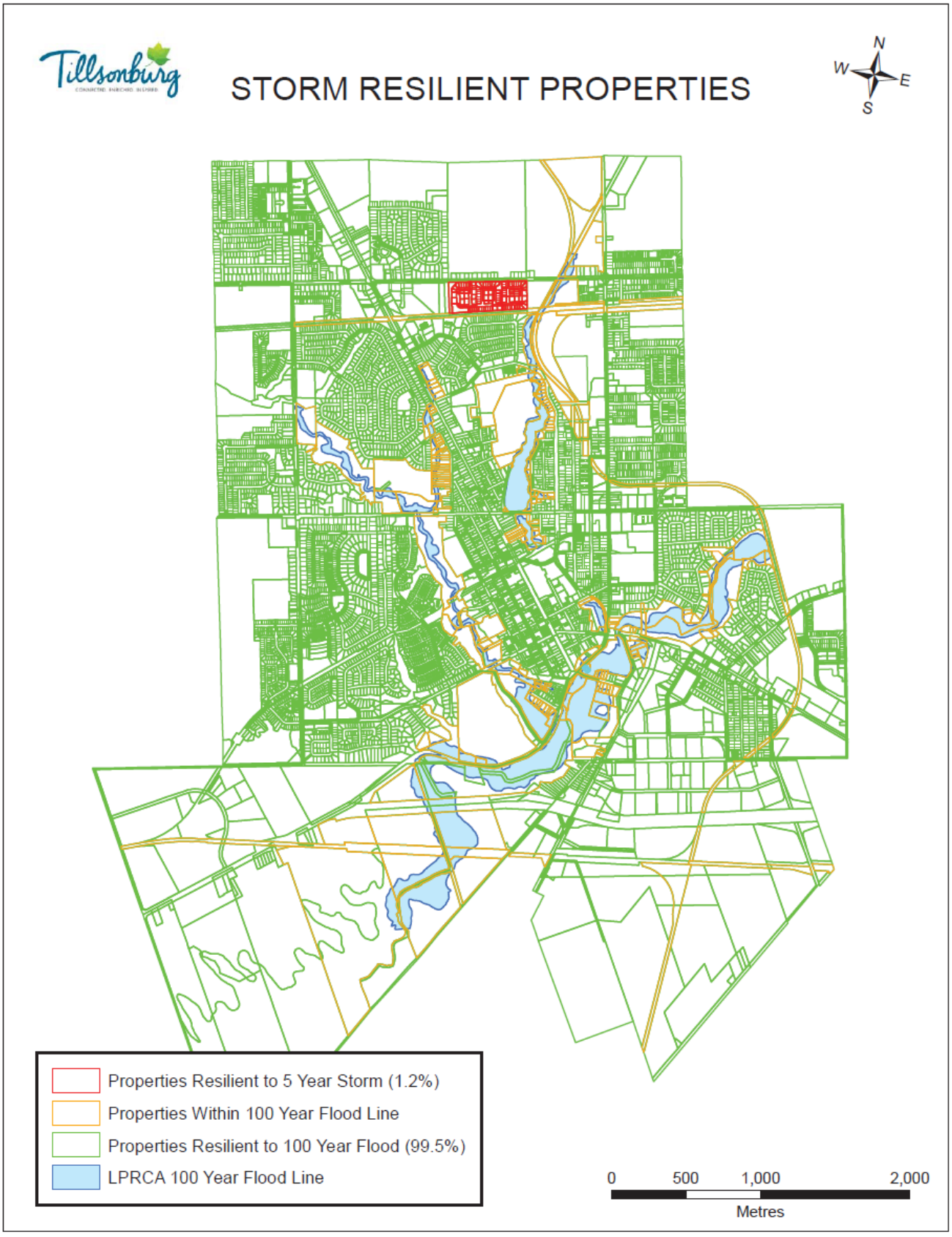
Pavement Condition Good – PCI 75 – 85

Pavement Condition Fair – PCI 58 – 74

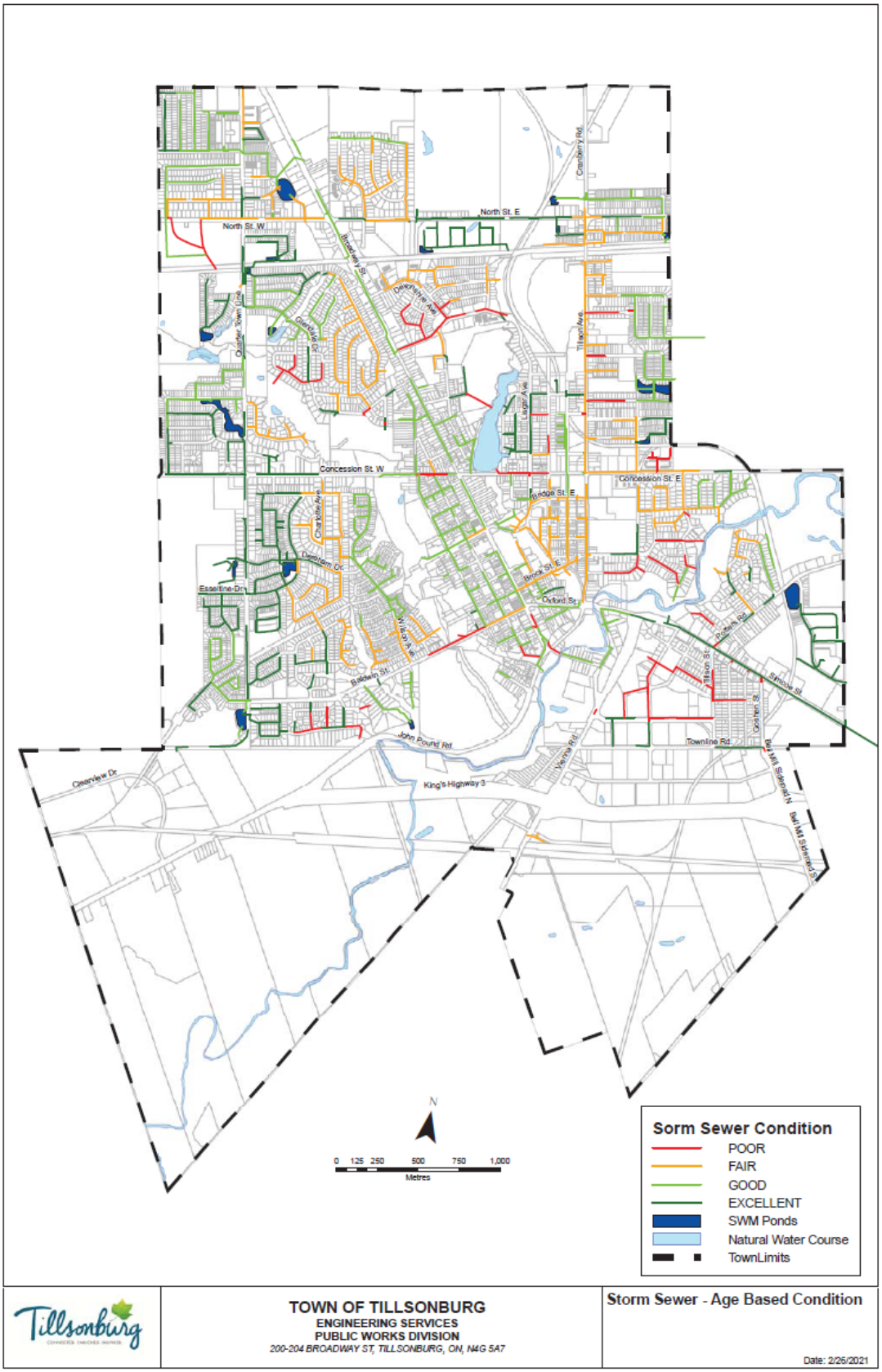
Pavement Condition Poor – PCI 40 – 57

Pavement Condition Critical – PCI 0 – 39

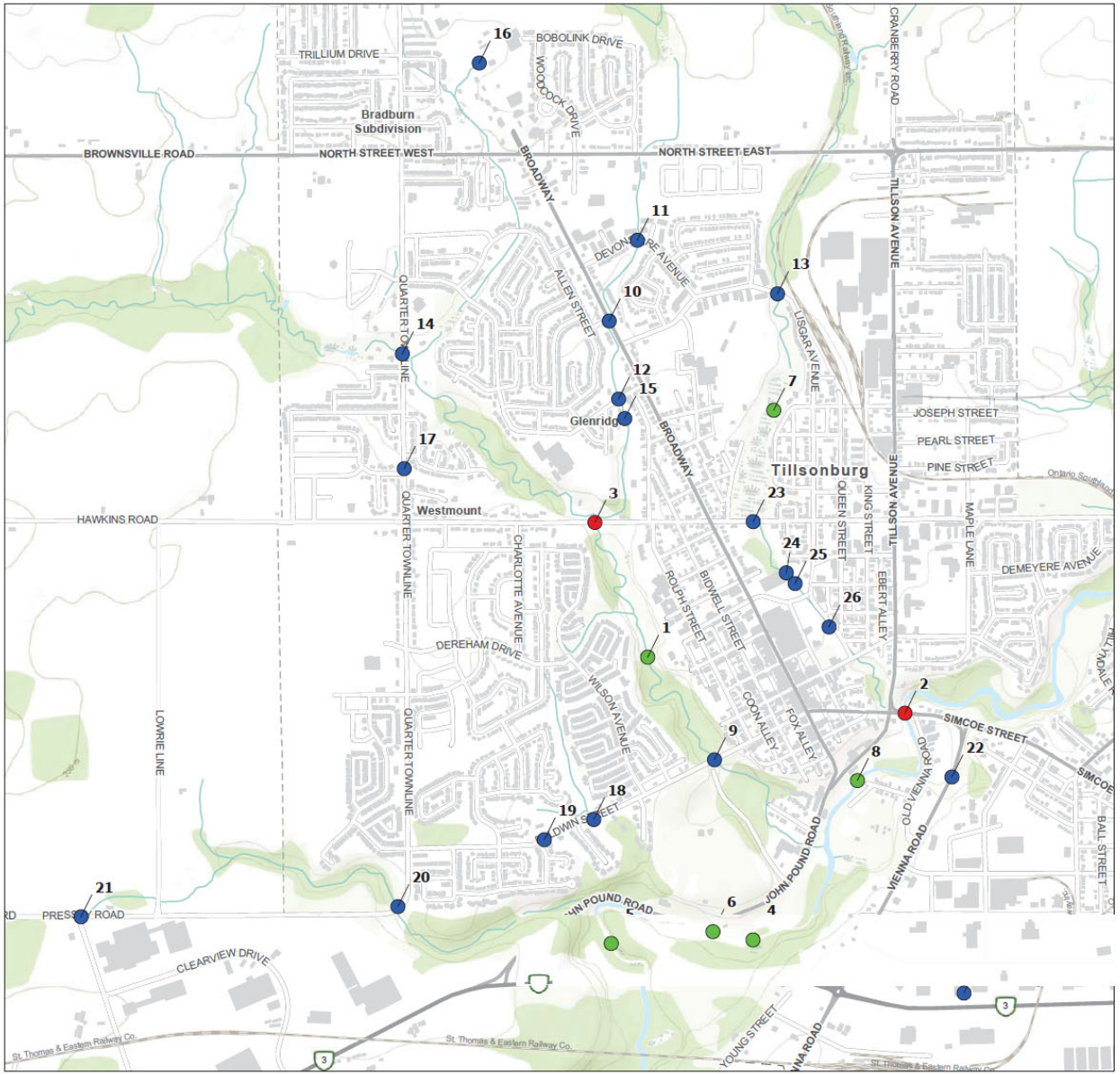
Appendix D: Storm Resilient Properties



Appendix E: Storm Network Condition



Appendix F: Bridge & Culvert Locations



Structure Inspections 2021

- Bridge
- Culvert
- Pedestrian Bridge

#	TYPE	UniqueID	STRUCTURE NAME	LOCATION
1	Pedestrian Bridge	RD_BR0001	BR_KINS0001	KINSMEN PEDESTRIAN BRIDGE
2	Bridge	RD_BR0005	BR_SIMC00001	SIMCOE ST. BRIDGE
3	Bridge	RD_BR0003	BR_CONCW0001	CONCESSION ST. W. BRIDGE
4	Pedestrian Bridge	RD_BR0007	BR_GOLF001	THE BRIDGES GOLF COURSE AT HOLE 10
5	Pedestrian Bridge	RD_BR0008	BR_GOLF002	THE BRIDGES GOLF COURSE AT JOHN POUND ROAD
6	Pedestrian Bridge	RD_BR0009	BR_GOLF003	THE BRIDGES GOLF COURSE AT HOLE 12 AND 17
7	Pedestrian Bridge	RD_BR0004	BR_LAKE0001	HAWKINS PEDESTRIAN BRIDGE
8	Pedestrian Bridge	RD_BR0002	BR_VAN0001	VAN ST. PEDESTRIAN BRIDGE
9	Culvert	STM_CUL0013	CU_BALD0654_1	BALDWIN ST. CULVERT AT PARTICIPARK TRAIL
10	Culvert	STM_CUL0037	CU_BROA2247_1	BROADWAY & CHRISTIE ST. CULVERT
11	Culvert	STM_CUL0028	CU_DEVONS0314_1	DEVONSHIRE AVE. CULVERT
12	Culvert	STM_CUL0031	CU_GLEN0176_1	GLENDALE DR. CULVERT AT VICTORIA ST.
13	Culvert	STM_CUL0030	CU_LISG1158_1	LISGAR AVE. NORTH CULVERT
14	Culvert	STM_CUL0025	CU_QUAR2685_1	QUARTER TOWN LINE CULVERT AT STONEY CREEK
15	Culvert	STM_CUL0033	CU_VICT0569_1	VICTORIA ST. DRIVEWAY ACCESS CULVERT
16	Culvert	STM_CUL0043	CU_BROA3948_1	BROADWAY ST. CULVERT AT SOBEYS
17	Culvert	STM_CUL0024	CU_QUAR1937 _12	QUARTER TOWN LINE AND OAK PARK POND
18	Culvert	STM_CUL0014	CU_BALD1103_1	BALDWIN ST. CULVERT AT WHISPERING PINE
19	Culvert	STM_CUL0015	CU_BALD1272_1	BALDWIN ST. AT GOLDENROD DR.
20	Culvert	STM_CUL0017	CU_NEWE1362_1	NEWELL ROAD CULVERT
21	Culvert	STM_CUL0021	CU_BAYH0993_1	BAYHAM DRIVE CULVERT
22	Culvert	STM_CUL0005	CU_VIEN0615 1	VIENNA RD. FROM STUBBS CRT. CULVERT
23	Culvert	STM_CUL0032	CU_CONCE0299_1	LAKE LISGAR OUTLET CULVERT
24	Culvert	STM_CUL0039	CU_BRIDE0274_1	LISGAR AVE. CULVERT PART 1
25	Culvert	STM_CUL0038	CU_BRIDE0274_2	LISGAR AVE. CULVERT PART 2
26	Culvert	STM_CUL0040	CU_LISG2209_1	LISGAR AVE. CULVERT OUTLET AT BROCK ST. E.
27	Culvert	STM_CUL0011	CU_SPRU0541_3	SPRUCE ST. CULVERT

TOWN OF TILLSONBURG
ENGINEERING SERVICES
PUBLIC WORKS DIVISION
200-204 BROADWAY ST, TILLSONBURG, ON, N4G 5A7

0 100 200 400 600 800
Meters

Appendix G: Bridge and Culvert Community Levels of Service – Quality

Poor Condition

OSIM Inspection Performance Snapshot

Kinsmen Pedestrian Bridge **Site Number: BR_KINS0001**

Location: 170m West of Rolph St.

OSIM Recommendation: Major Rehab - 1 to 5 years

BCI	45

Overall Comments:

Enhanced OSIM Inspection completed with use of rope access technicians. All structure members inspected to determine severity of deterioration. Steel members showing light to severe corrosion and delamination. Delaminated steel sections are flaking. Steel strapping missing on North I pier cap (refer to Enhanced OSIM Drawing for element locations). The overall condition... Refer to OSIM for details.

General Structure Information:

Lanes:	1
Type:	I-Beam or Girders
Spans:	9
Span Length:	8 @ 11m, 1 @18m
AADT:	
Posted Speed:	
Load Limit (Tonnes):	None
Construction Date:	1910
Inspection Date:	June 17, 2019

Costing Summary:

Task	Cost Estimate
Construction Costs	$1,721,000.00
Associated Costs	$1,130,000.00
Total Costs	**$2,851,000.00**

Fair Condition

OSIM Inspection Performance Snapshot

Concession St. W. Bridge **Site Number: BR_CONCW0001**

Location: 480m West of Broadway St.

OSIM Recommendation: Minor Rehab - 6 to 10 years

BCI 70

Overall Comments:

Localized cracking and delamination noted in soffit.

General Structure Information:	
Lanes:	2
Type:	Rigid Frame, Vertical Legs
Spans:	1
Span Length:	10.7 m
AADT:	4280
Posted Speed:	50
Load Limit (Tonnes):	None
Construction Date:	1955
Inspection Date:	May 21, 2019

Costing Summary:	
Task	**Cost Estimate**
Construction Costs	$138,000.00
Associated Costs	$110,000.00
Total Costs	**$248,000.00**

Excellent Condition

OSIM Inspection Performance Snapshot

The Bridges Golf Course at Hole 10 **Site Number: BR_GOLF0001**

Location: Carroll Trail at Hole 10

OSIM Recommendation: Maintenance Only

BCI 89

Overall Comments:

The structure is generally in good condition.

General Structure Information:	
Lanes:	1
Type:	Half-Through Truss
Spans:	1
Span Length:	28 m
AADT:	
Posted Speed:	
Load Limit (Tonnes):	5.9 / /
Construction Date:	2005
Inspection Date:	May 21, 2019

Costing Summary:	
Task	**Cost Estimate**
Construction Costs	$4,500.00
Associated Costs	$4,000.00
Total Costs	**$8,500.00**