Asset Management Plan

November 2014 (FINAL DRAFT)

Revision #1 – August 2015

Executive Summary

Historically, the City of Temiskaming Shores has been proactively and responsibly managing its infrastructure portfolio. As the infrastructure ages and demands increase, so will the challenge of ensuring the needs of the community are effectively met with the limited resources available. This Asset Management Plan (Plan) will hopefully address this concern by providing a framework for considering, prioritizing, and optimizing asset management efforts, and providing direction for effective management of the Municipal infrastructure to best achieve established goals and objectives.

This Plan seeks to formalize and present some of the major capital infrastructure needs, with an emphasis on the 10 year period from 2014 to 2023, and provide a framework for expanding and enhancing the Municipality’s asset management system. The Plan considers the Municipality’s water system, sanitary sewer system, storm sewer system, transportation network (roads, bridges, sidewalks, lighting), facilities, equipment, and fleet.

As the City’s first Asset Management Plan, the focus of the Plan is primarily on major capital needs. Therefore, the Estimated Service Life (ESL) of assets was used as the primary indicator for measuring infrastructure Levels of Service (LoS). Areas the Municipality will focus on to advance its Asset Management Capabilities and improve future updated versions of the Plan are highlighted throughout.

It should be noted that while this Plan focuses on the forecasted Capital Needs, the City remains proactive and responsible in managing its infrastructure. Several Inspection Programs are currently in practice in the Municipality, including a CCTV program for Sanitary and Storm Sewer Systems, updating or Roads Needs Studies, and OSIM inspections of Temiskaming Shore’s Bridge and Culvert inventory. The costs associated with these programs, however, have not been incorporated in this Plan.

This Plan is considered and ‘living document” and will be updated and revised as additional information becomes available, as existing infrastructure is renewed and as changes in strategy are required. To ensure that the Plan remains visible, it will be referred to in regular reports to Council. Every five years, a full review of the City’s Asset Management Planning process should be considered and major changes may be presented to Council more frequently, if required.

A major component of this Plan is related to non-infrastructure solutions intended to improve the City’s Asset Management Capacity. This includes the development of a dedicated Asset Management System and a complete well-designed GIS to support Municipal Asset Management efforts. Details for the non-infrastructure solutions are presented in Section 6.2. Alongside this task, the City shall integrate and align its data records between departments such that in the final Asset Management System, asset information will only need to be stored in one location and the data will be structured to

enable effective management of the City’s infrastructure. This will include refinement of the existing infrastructure data bases, such as that contained in PSAB reporting and Roads Needs Studies, utilizing the same segmentation and naming conventions for consistency.

A financial strategy is being developed to achieve the forecast capital needs. In the short-term strategy (2014 to 2023), the current water levy is not sufficient for financing the forecast expenditures. In order to finance the long term requirements of the water system an annual rate increase of up to 3.5% may be required. The sanitary sewer levy may be sufficient, however, an annual rate increase of up to 2.5% should be considered. Similarly, the Tax Supported capital program would require an annual tax rate increase of 2.5%. For the long-term strategy (2014 to 2038), maintaining the rate and tax increases as constant, after the first 10 years, will achieve a financially sustainable plan. It should be noted that in some years the financing may be insufficient. In these years, short-term borrowings may be utilized to cover the shortfall.

The best strategy to address the long-term financing shortfall is to develop improved asset management tools and processes. This will allow the City of Temiskaming Shores to prepare a more accurate estimate of the infrastructure needs that is not solely based on replacing infrastructure when it is at the end of its useful life. These strategies will include the following:

- Establish levels of service and the associated performance metrics to track how well the infrastructure is meeting the service levels. This may result in some higher-risk assets being renewed at a later time than what was established in the analysis performed in this Plan. However, this may also result in some lower-risk assets becoming a priority for renewal at an earlier time than what was established in this Plan. For example, some storm water infrastructure that is identified as a low risk asset may need to be replaced because it is not meeting a level of service regarding flood protection.

- Complete detailed investigations into the operating and maintenance costs of the City’s infrastructure, and complete analyses to determine if they are within industry standards or if they can be optimized to reduce the long term costs. For example, this may demonstrate that the construction of a new, energy efficient facility to replace an old facility will have a long term financial savings to the City. This will allow the money being used to operate the facilities to be used to address the renewal of other infrastructure.

- Collect and review additional condition/performance information for the City’s infrastructure to better assess the probability of failure. For example, tracking and reviewing water main break records is a much better indicator for the future probability of failure of the asset. This analysis can then be used to adjust the infrastructure needs.

- Consider non-infrastructure solutions to achieve service levels. For example, promoting a cycling-friendly community could be accomplished by improved signage, reducing speed limits or undertaking educational campaigns, all of which would not require maintaining service levels.

- Consider consolidating or eliminating redundant infrastructure. For example, removing bridges that are under-utilized and which have alternate routes that can be used by the community thereby reducing the long term infrastructure needs while maintaining service levels.

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1. Introduction

1.1 About the City of Temiskaming Shores

The City of Temiskaming Shores is located on the shores of beautiful Lake Temiskaming in northeastern Ontario. The community is at the head of the Ottawa River waterway and offers all of the amenities and services found in larger centres. The community was founded in 2004 by the amalgamation of the former communities of Haileybury, New Liskeard and Dymond.

Temiskaming Shores is a community with endless opportunities for business development within a setting that offers a range of residential living environments and four-season recreation at the doorstep. Scenic landscapes, a healthy environment, an abundance of clean water, a rich heritage, a mature range of consumers, educational, social and health care services, and a multi-cultural population offer a quality living environment for this northern community. The provision of regional services in the areas of education, health and public administration to the 35,000 people living throughout the rest of Timiskaming District and northwestern Quebec fill out the City's economic impact.

1.2 City of Temiskaming Shores Mission & Values Statements

Mission Statement:

To ensure that the City of Temiskaming Shores is a dynamic leader providing incredible opportunities for all.

Statement of Values:

The Municipal Government of the Corporation of the City of Temiskaming Shores hereby adopts and embraces the following values as being integral to its good governance:

Responsibility, Teamwork, Promise-Keeping and Fairness

1.3 Asset Management Plan Purpose

Historically, the City of Temiskaming Shores has been proactively and responsibly managing its infrastructure portfolio. As the infrastructure ages and demands increase, so will the challenge of ensuring the needs of the community are effectively met with the limited resources available. This Asset Management Plan (Plan) will hopefully address this concern by providing a framework for considering, prioritizing, and optimizing asset management efforts, and providing direction for effective management of the Municipal infrastructure to best achieve established goals and objectives.

As an integrated Plan, this AMP considers the lifecycle and needs of all infrastructure assets and classes within the Plan’s scope and provides a sustainable and holistic view of the asset portfolios described herein. The Plan not only focuses on managing individual assets, but considers the condition and performance of complete asset systems through a systematic, risk-based decision-making process. The resulting Plan is intended to provide the optimal allocation of resources towards meeting prescribed goals, objectives, and levels of service.

The City currently manages an asset portfolio of over $308.92 M worth of public physical capital assets (estimated replacement value, 2013 CAD). These assets provide the foundation upon which the City’s economic growth, strength and quality of life are based. This Asset Management Plan is an overview for managing assets of all categories in the City’s portfolio. Major asset categories and assets may also have individual or specific plans developed to assist in the guidance of their management, though those plans will be in compliance with the strategies and activities adopted by the over-arching AMP.

This Plan is being developed under Council Resolution No. 2012-475, dated October 16, 2012, at which time Council approved the submission of an Expression of Interest to obtain funding for the preparation of the comprehensive Asset Management Plan. Council are committed to supporting the initiative and has fully endorsed the creation of the Plan when presented at the regular meeting of Council, in preliminary form, on December 17, 2013. Since that time staff have been refining inventories of assets groups and amending the Plan. The final draft of this Plan will be presented to Council upon completion of the Financial Strategy which is anticipated to be completed in conjunction with the presentation and approval of the 2015 Municipal Budget. Once approved, changes the Plan will be reported to and approved by Council, as required, to address changing circumstances.

1.4 Asset Management Plan Goals and Objectives

The City of Temiskaming Shores currently manages its infrastructure proactively and with fiscal responsibility. A variety of programmes have already been initiated to improve the quality of investment decisions made, and support the City’s asset management efforts. This Plan seeks to formalize and present some of the major capital infrastructure needs, with an emphasis on the initial 10 year period from 2014 to 2023, and provide a framework for expanding and enhancing the City’s asset management system.

1.5 Relationship with Other Documents

Funding for the preparation of this Asset Management Plan was provided, in part, by the Ministry of Infrastructure’s *Building Together* program as well as from within the existing Municipal Budget documents. Our operation and maintenance practices are guided by the strategies presented herein but operate under the budgets established by Council.

The City utilizes a standard Geographic Information System (GIS), where information is available, as well as data held in the various spreadsheets and other forms. Some of the data available appears to overlap traditional segmentation of roads or piped infrastructure information. Assumptions were made to combine data where this overlap was evident. Information from some of the sources could not be combined due to the naming or segmentation creating ambiguity in the data.

1.6 Asset Management Plan Scope

The City’s Asset Management System encompasses Asset Management Strategies and Policies, the management of all assets within the various categories from conception to end-of-life, performance and condition monitoring and assessment, risk management, financing strategies, future demand and improvement processes.

This Plan considers the following asset categories:

Water System:

- Approximately 82 kilometres of water distribution infrastructure.
- Approximately 3500 water service connections of various sizes.
- Approximately 775 control valves.
- Approximately 460 hydrants.

Sanitary Sewer System:

- Approximately 70.4 kilometres of sanitary sewer collection infrastructure.
- Approximately 3500 sanitary sewer connections.
- Approximately 898 maintenance holes.

Storm Sewer System:

- Approximately 52.3 kilometres of storm sewer collection infrastructure.
- Approximately 845 catch basins and maintenance holes.
- Approximately 468 kilometres of drainage ditches.

Transportation System:

- Approximately 221.4 lane kilometres of paved roadway.
- Approximately 20.4 lane kilometres of surface treated roadway.
- Approximately 245.5 lane kilometres of gravel roadway.
- Approximately 42.8 kilometres of sidewalk.
- Approximately 20.6 kilometres of active trails.
- 9 Bridge structures.
- 6 Large diameter culverts.
- 1180 Street & Decorative lights.

- 5 Traffic Control light installations.

Other Assets:

- 579 Land parcels, buildings & facilities
- 65 Fleet & Heavy equipment units

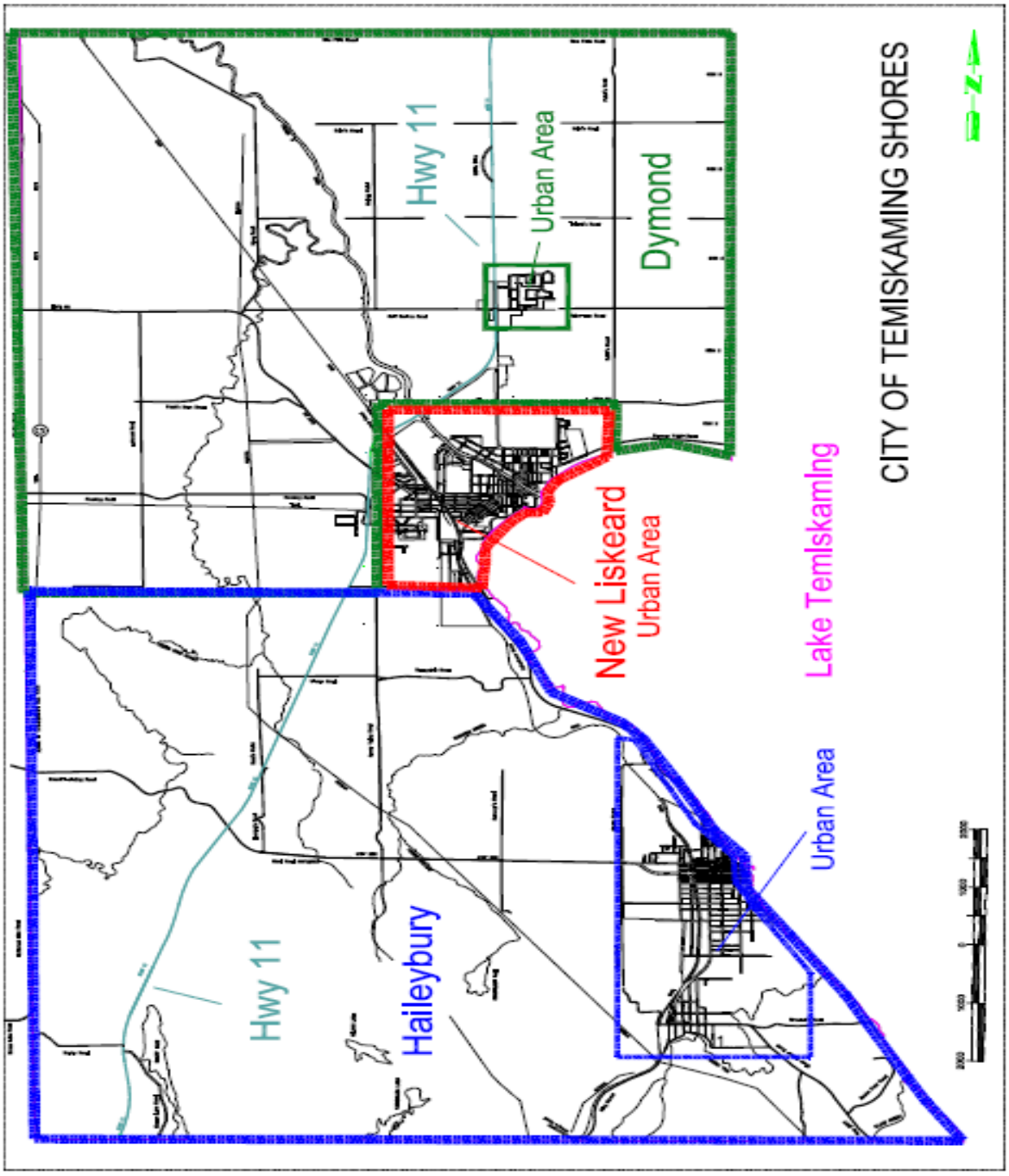


Figure 1-1: Overview Map of Temiskaming Shores

This Plan has been prepared for the period of 2014 to 2023, inclusive. The process for developing the next Plan should commence in 2020, following the development process outlined in Section 1.7. Individual limitations identified during the preparation of this Plan, as well as intended next steps for its revision and future Plans, are also documented herein.

While the Plan process will be repeated in 2020, the City should conduct an annual review of the State of Infrastructure report. The evaluation and improvement process discussed in Section 1.8 also reflects the intent that this Plan be considered a "living document," to be revised and updated as necessary.

1.7 Asset Management Plan Development Process

Through the funding provided, in part, by the Ministry of Infrastructure's *Building Together* program the City of Temiskaming Shores utilized existing staff and resources as well as contract support persons to facilitate the development of this Plan. The process for developing the Asset Management Plan, limitations of the current version of the Plan, and planned next steps are detailed below.

1.7.1 Municipal Goals and Objectives:

The first step in the Plan development process was to determine the desired outcomes, as well as plan the approach or approaches that were to be used to achieve them.

Known infrastructure inventories and all other available information were used within individual asset groups to identify and express priorities and needs associated with provision of those services. A plenary session involving staff, elected officials and other appropriate stakeholders was also used to identify and discuss these goals and objectives.

Limitations of this Plan

The City considers this to be the first stage of a larger, continual Asset Management Planning process that forms an important part of its overall Asset Management effort. As a result of the project timeline and data availability, certain elements have been excluded from this version of the Plan. The City will seek to incorporate the missing data in future revisions or updates of the Plan.

Next Steps

As the City moves forward with its Asset Management practices, the Plan will be adjusted to reflect a more accurate representation of asset needs. The City will re-visit the Goals and Objectives documented in this Plan as additional information becomes available, and at a minimum, review them upon repeating the Asset Management Planning process for the next Plan revision.

1.7.2 State of Infrastructure:

The second step in the Plan development process was to determine the current State of Infrastructure. While the State of Infrastructure is independent of infrastructure needs, a thorough understanding of the present state of infrastructure was determined to be a key element required when considering the needs of the infrastructure portfolio and what levels of service can realistically be achieved. There are a variety of ways to assess and report on the State of Infrastructure.

Individual asset performance and condition assessments are considered as the preferred measure for assessing the state of individual infrastructure assets, though asset age or maintenance data were also used as an indicator where the information was otherwise unavailable.

The City of Temiskaming Shores currently has several infrastructure condition monitoring and assessment programs in place, including;

- Sanitary and Storm Sewer CCTV program:

  A large portion of Sanitary and Storm Sewer systems have been inspected over a number of years and the condition of these sections have been documented to highlight areas that should be considered as priority for replacement or rehabilitation. Moving forward, the City has acquired a CCTV camera and consideration will be given to prioritizing the inspection of those areas that poise gaps in information.

- Road Needs Study:

  The most recent Roads Needs Study (RNS) was updated in 2013 utilizing internal staff and knowledge. This study reviewed the road network, broke the various road sections down into workable segments, consistent in their characteristics and other infrastructure located within, and recorded the performance and condition details for each. This information has and will continue to be used to identify the capital and maintenance needs of the system, the timing for the required work and the road priority.

- OSIM Bridge Inspections:

  As legislated by the Province of Ontario, every bridge and large diameter culvert is inspected under the Ontario Structure Inspection Manual (OSIM) every two years. The most recent inspection was carried out by a qualified consultant in 2012 and is being repeated in 2014. From this inspection, a Bridge Condition Index (BCI) was developed that assists in the scheduling of bridge maintenance and upkeep. Safety concerns are addressed immediately.

Limitations of this Plan

This initial version of the Plan is largely based on infrastructure asset age information collected through PSAB 3150 reporting records as well as all available information on the asset groups during the summer of 2013.

Additional limitations, that have been identified, are documented in Section 3 of the Plan, identified by Asset Category.

Next Steps

The City should consider revisions to the procurement policies to support and improve data management practices. Contract terms should specify the format of electronic deliverables and define minimum data requirements to support Asset Management efforts moving forward.

All reporting procedures should incorporate / include asset condition information, as it becomes available. This will assist in determining or establishing a more accurate representation of the State of Infrastructure.

1.7.3 Levels of Service:

Level of Service (LoS) defines the performance required of the infrastructure. To measure a Level of Service, one or more corresponding Key Performance Indicator (KPI) have to be identified. In order to minimize monitoring and analysis efforts, the Key Performance Indicators monitored should be limited to only those required to measure Levels of Service.

Limitations of this Plan

The Levels of Service defined for the initial version of the Plan have been limited to those associated with the capital replacement of assets. An Estimated Service Life was established for each asset that corresponds with either the typical lifespan experienced in industry, or adjusted to better represent the Asset Management Strategy for the replacement or retention of the particular asset.

Next Steps

The City should conduct a review of the planning needs to determine data and information gaps and any additional requirements to further refine the Plan.

Target Levels of Service should be identified and associated Key Performance Indicators, particularly those not necessarily related to the capital replacement of assets. This may include financial performance (e.g., time to billing), customer service performance (e.g., response time to customer complaints), or operations & maintenance performance (e.g., time to repairs).

Monitoring programs should be developed and initiated to collect information required to measure all identified Key Performance Indicators. This would include the associated data management policies and procedures.

1.7.4 Asset Management Strategy:

The Asset Management Strategy identifies and describes the actions and set of planned actions that will enable the assets to provide the desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost.

Limitations of this Plan

Due to the data available, the Asset Management Strategy in this inaugural version of the Plan focused on forecasting the time for capital replacement or major rehabilitation of assets. Priority was given to integrating planning for optimization of the capital work forecast in the ten year period from 2014 to 2023.

Non-infrastructure solutions were limited to strategies oriented around advancing the Municipality’s Asset Management capabilities.

The City of Temiskaming Shores currently has several active programs in place for asset monitoring, operation and maintenance. In the preparation of this Plan, *there was no indication that the status quo approach is insufficient*. The major concern of the City is with respect to the aging infrastructure inventories and the eventual replacement needs, so this Plan was developed to focus primarily on those issues.

Next Steps

As indicated previously, the continued collection of asset condition benchmarks and monitoring of existing Key Performance Indicators is of the utmost importance. The identification of basic infrastructure-related statistics, such as number of pipe breaks per year, time to asset repair, or customer complaint response time will assist in determining and / or verifying the priorities of the City.

The integration of current and planned Operations & Maintenance programs and activities, into the Asset Management Strategy, should also be implemented. This would include the identification of regularly scheduled inspection and maintenance activities, associated estimated costs and timing as well as studies, reports or reviews conducted as part of the asset management process.

Consideration should also be given for the inclusion of any non-infrastructure solutions that may be identified as the Plan is implemented, reviewed and refined.

1.7.5 Financial Strategy:

The financial strategy is the final component of the Plan and allows the plan to move forward with the Asset Management Strategy that was provided previously in this report.

The City of Temiskaming Shores provides funding for assets through three sources of revenue which includes Wastewater Rates, Water Rates and the general Municipal Tax Levy. The financial strategy supports this method of operating by addressing these three separate areas and would identify any shortfalls. Provincial and Federal funding programs are also utilized, when available to assist in funding major capital works projects.

Limitations of this Plan

The Financial Strategy is largely limited to Capital Works, corresponding with the overall focus of this Plan.

Next Steps

The City must determine the willingness of the ratepayers to pay any proposed increase in rates or charges for service.

1.7.6 Council Presentation

To maintain the visibility of the City’s Asset Management Plan, the Plan will be referred to in Administration Reports to Council as applicable. Major revisions to the Plan and significant changes to the State of Infrastructure report shall be presented annually or more frequently, as necessary.

1.8 The Asset Management Plan as a “Living Document”

The process for developing and implementing this Plan was intended to follow the Deming cycle for quality control; Plan, Do, Check, Act. This process provides a framework for continual monitoring and improvement of the Plan, as well as for planned asset management strategies and activities. A variety of components are included in each step as outlined below.

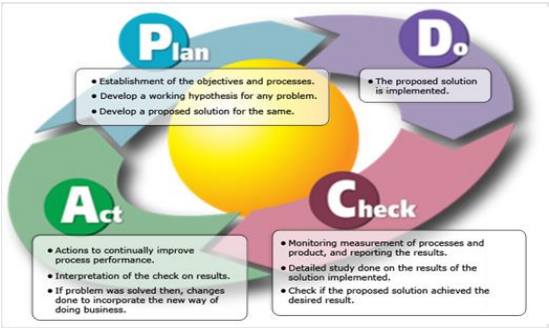


Figure1-2: Deming Cycle

Step 1: Plan

The following components are included in this step:

Review of Previous Plan

Prior to establishing or revising the Asset Management Plan, any previous Plans will be reviewed. This review will establish a historical context for the decisions made and an understanding of the future visions pursued, as well as providing a framework to measure asset performance against. By recognizing the “living” nature of the Plan documents, evaluation of changes made over time will also serve to identify best practices and unsuccessful strategies to avoid. Where the Plan continues to serve the City’s needs, it may serve as a template to produce future Plans.

Audit Results and Auditor Recommendations

Results from any audits on the Asset Management Plan or System, as well as any associated auditor recommendations, will be considered in revising the active Plan and producing future Plans.

Management Review Results

As part of the third step of the Plan development process, a management review shall be conducted. While the results from this review are intended to be incorporated in the existing Plan as a process of continuing improvement, some issues may not be immediately actionable. Assessment of the management review results during the development process for subsequent Plans will provide the opportunity to re-assess and potentially implement recommendations that were previously not accepted.

The full Asset Management Planning process should be undertaken by the City every five years. The process should be initiated one year prior to the intended release of the updated or revised Plan. The City may consider retaining the services of an outside

party, such as an independent consultant, to facilitate the review and revision of at least every second Plan in order to incorporate changes to industry good practice and capture the benefits of an external review.

Step 2: Do

The second step of the Plan development process is its implementation. The Plan will be implemented upon completion of the first step. Where necessary, significant changes may be implemented through a phased approach as documented in the Plan.

Step 3: Check

The Plan shall be considered a “living document,” to be revised and refined as required. Prior to making adjustments, the efficacy and propriety of the Plan, strategies and activities must be assessed. This is performed through six approaches: monitoring, inspections and testing, performance documentation, audits, management reviews, and stakeholder engagement.

Monitoring

Asset management activities specified in the Plan will be monitored on an on-going basis. Overall activities in the Plan will be compared with performance measures and the results will be used to develop an improvement plan which will document specific tasks.

The State of Infrastructure report will also be reviewed and revised on an annual basis by the City.

It is anticipated that in the early stages of implementation this monitoring may lead to more frequent adjustments to the Plan.

Inspections and Testing

Assets will be inspected and tested as specified in the Plan. If subsequent inspections identify significant deterioration in condition or performance, corrective actions may be undertaken and inspection frequency may be increased until the desired outcome is achieved and confirmed.

Performance Documentation

A review of asset performance, with respect to design capacity in comparison to actual measured capacity, of specific assets may be carried out to ensure that he desired Level of Service can be provided. This review may take the form of summary tables or charts displaying capacity in relation to levels of service. It may also include assessment of other studies or models used to evaluate asset performance, such as water system models or traffic demand studies.

Management Review

The Asset Management System, including applicable policies, procedures, and Plans, should undergo management review every (3) three years.

Audits

The Asset Management System, including applicable policies, procedures, and Plans, may undergo audit by an external consultant every (5) five years.

Step 4: Act

The final step in the Plan development is to act on the information gathered from the previous step. This step is implemented through continual plan evaluation and improvement efforts. The Plan will be evaluated and adjusted on an ongoing basis by Municipal staff and management during implementation. Formal Management evaluation and audited reviews will take place as described previously. The outcomes and recommendations of each review will be incorporated into improving future versions of the Plan.

2. Asset Management Policy

An Asset Management Policy may be defined as the "*principles and mandated requirements derived from, and consistent with, the organizational strategic plan, providing a framework for the development and implementation of the asset management strategy and the setting of the asset management objectives".*

Simply put, the asset management policy defines an organization's commitment to asset management and provides staff with a mandate and direction to implement the Plan strategy and activities in compliance with the overall organizational strategic plan. Creation of such policies is an essential requirement of Asset Management Systems and, at the very least, highly recommended by most recognized guidelines and standards, including InfraGuide and the International Infrastructure Management Manual (IIMM).

The City of Temiskaming Shores formally adopted a documented Municipal Asset Management Policy by Resolution No. 2013-120, dated March 19, 2013. This Policy signifies Councils commitment to effective Asset Management, and the establishment of Municipal priorities for our Asset Management programmes.

2.1 Policy Statements

Asset management is a broad strategic framework that encompasses many disciplines and involves the entire organization. The term asset management, as used in this document, is defined as *"The application of sound technical, social and economic*

principles that considers present and future needs of users, and the service from the asset.”

To guide the organization, the following policy statements have been developed:

a) The City of Temiskaming Shores will maintain and manage infrastructure assets at defined levels to support public safety, community well-being and community goals.

b) The City of Temiskaming Shores will monitor standards and service levels to ensure that they meet/support community and Council goals and objectives.

c) The City of Temiskaming Shores will develop and maintain asset inventories of all of its infrastructures.

d) The City of Temiskaming Shores will establish infrastructure replacement strategies through the use of full life cycle costing principals.

e) The City of Temiskaming Shores will plan financially for the appropriate level of maintenance of assets to deliver service levels and extend the useful life of assets.

f) The City of Temiskaming Shores will plan for and provide stable long term funding to replace and/or renew and/or decommission infrastructure assets.

g) Where appropriate, the City of Temiskaming Shores will consider and incorporate asset management in its other corporate plans.

h) The City of Temiskaming Shores will report to citizens regularly on the status and performance of work related to the implementation of this asset management policy.

2.2 Background & Purpose of Asset Management Policy

Council has a mandate to provide a wide range of services. Council adopts policies that support their vision, goals and objectives and guide staff to effectively implement the policy for the delivery of those services.

Council vision and goals for infrastructure assets

Council’s vision and goal for the community is a safe, livable, sustainable and economically vibrant community underpinned by well managed and maintained infrastructure assets. These assets include but are not limited to efficient transportation networks, safe and reliable water distribution networks, economical and reliable sewage collection systems, productive fleets, and accessible parks, recreation and civic facilities.

Though these assets age and deteriorate, by using sound asset management practices, Council and the community can be assured that the assets meet performance levels,

are used to deliver the desired service in the long term and are managed for present and future users.

This policy is to articulate Council’s commitment to asset management, and guides staff using the policy statements. In doing so, this policy also outlines how it is to be intergraded within the organization in such a way that it is coordinated, cost effective and organizationally sustainable. This policy also demonstrates to the community that Council is exercising good stewardship, and is delivering affordable service while considering its legacy to future residents.

Staff will implement the policy through the development and use of asset management guidelines and best practices. Since the performance of asset management is organization specific, reflective of knowledge, technologies and available tools, and will evolve over time, the responsibility for developing guidelines and practices is delegated to staff.

2.3 Policy Principles, Guidelines and Integration

Principles

The key principles of the asset management policy are outlined in the following list.

The City shall:

- Make informed decisions by identifying all revenues and costs (including operation, maintenance, replacement and decommission) associated with infrastructure asset decisions, including additions and deletions. Trade-offs shall be articulated and evaluated, and the basis of the decision recorded.
- Integrate corporate, financial, business, technical and budgetary planning for infrastructure assets.
- Establish organizational accountability and responsibility for asset inventory, condition, use and performance.
- Consult with stakeholders where appropriate.
- Define and articulate service, maintenance and replacement levels and outcomes.
- Use available resources effectively.
- Manage assets to be sustainable.
- Minimize total life cycle costs of assets.
- Consider environmental and energy conservation goals.
- Consider social and sustainability goals.

- Minimize risks to users and risks associated with failure.
- Pursue best practices where available.
- Report the performance of its asset management program.

Guidelines and Practices

This policy shall be implemented by staff using accepted industry guidelines and best practices (such as those recommended by the Federation of Canadian Municipalities e.g., InfraGuide).

The City will also comply with required capital asset reporting requirements, and integrate the asset management program into operational plans throughout the organization.

Strategic Asset Management Plans may be developed for a specific class of assets, or be generic for all assets, and should outline long term goals, processes and steps toward how they will be achieved. The Asset Management Plans should be based on current inventories and condition (acquired or derived), projected or desired performance and remaining service life and consequences of losses ***(e.g., vulnerability assessments, Emergency Management Ontario Critical Infrastructure Consequence of Loss Assessment***). Operational plans should reflect these details. Replacement portfolios and associated financial plans should consider alternative scenarios and risks, as well as include public consultation.

Context and integration of Asset Management within the City

The context and integration of asset management throughout the organization's lines of business is typically formalized through references and linkages between corporate documents. Where possible and appropriate, Council and staff will consider this policy and integrate it in the development of corporate documents such as:

- Official plan
- Business plans
- Corporate strategic plan
- Corporate financial plan
- Capital budget plan
- Operational plans and budgets (including vehicle and fleet plans and budgets)
- Energy Conservation plans
- Neighborhood plans
- Community Improvement plans
- Annual reports
- Design criteria and specifications
- Infrastructure servicing, management and replacement plans, e.g., transportation plans

- Community social plans
- Parks and recreation plans
- Facility plans

2.4 Key Roles for Managing the Asset Management Policy

City policies are approved by Council. While staff, public and other agencies may provide input on the nature and text of the policy, Council retains the authority to approve, update, amend or rescind policies.

Role	Responsibility
Identification of issues, and development of policy updates	Council and staff
Establish levels of service	Council, staff and public
Exercise stewardship of assets, adopt policy and budgets	Council
Implementation of policy	City Manager and staff
Development of guidelines and practices	City Manager and staff
On-going review of policies	Council and staff

Implementation, review and reporting of Asset Management work

The implementation, review and reporting of this policy shall be integrated within the organization. Due to the importance of this policy, the organization’s asset management program shall be reported annually to the community, and implementation of this policy reviewed by Council at the mid-point of its term.

Actions	Responsibility
Adopt Asset Management Policy	Council and City Manager
Monitor and review infrastructure standards and service levels at established intervals	Council and City Manager
Develop and maintain infrastructure strategies including development and service plans	Recreational Services, Community Growth and Planning, Public Works, Finance, other asset operation and maintenance departments, Finance
Develop and maintain asset inventories	Public Works, Finance, other asset operation and maintenance departments, Finance
Assess infrastructure condition and service levels	Public Works, and other asset operation and maintenance departments
Establish and monitor infrastructure	Public Works, Finance, and other asset

replacement levels through the use of full life cycle costing principles	operation and maintenance departments
Develop and maintain financial plans for the appropriate level of maintenance, rehabilitation, extension and decommission of assets	Public Works, Finance, and other asset operation and maintenance departments, Finance
Report to citizens on status of the community’s infrastructure assets and asset management program. The channels may include annual citizen reports, business plans, etc.	Council, City Manager, Corporate Services

3. Infrastructure Data Collection

3.1 Water System Inventory

The water system infrastructure inventory data used for the analysis was gathered from several sources. The combination of GIS information collected for this asset as well as other available records and information were combined to provide a relatively accurate accounting. Limited global positioning (GPS) data was available for the hydrants, curb stops and water valves connected to the water infrastructure, however, the inventory of those appurtenances, linked to the water infrastructure piping, are also considered to be fairly accurate. Base information about the material, installation date, diameter and length were derived from available records and data related to the system. These records also provided information about the size of valves, hydrants and connections per pipe segment and the two data sets were linked via their street (location) information. The cost of valves, hydrants and associated appurtenances were rolled up into the installation and replacement values.

3.2 Sanitary Sewer System Inventory

The sanitary sewer system infrastructure data used for the analysis was compiled from several sources. The combination of GIS information collected for this asset as well as other available records and information were combined to provide a relatively accurate accounting. Limited global positioning (GPS) data was available for the maintenance holes and cleanouts connected to the sanitary infrastructure, however, the inventory of those appurtenances, linked to the sanitary sewer infrastructure piping, are also considered to be fairly accurate. Base information about the material, installation date, diameter and length were derived from available records and data related to the system. These records also provided information about the number and location of maintenance holes and connections per pipe segment and the two data sets were linked via their street (location) information. The cost of manholes and associated appurtenances were rolled up into the installation and replacement values.

3.3 Storm Sewer System Inventory

The storm sewer system infrastructure data used for the analysis was compiled from several sources. The combination of GIS information collected for this asset as well as other available records and information were combined to provide a relatively accurate accounting. Limited global positioning (GPS) data was available for the maintenance holes and catch basins connected to the storm water infrastructure, however, the inventory of those appurtenances, linked to the storm sewer infrastructure piping are also considered to be fairly accurate. Base information about the material, installation date, diameter and length were derived from available records and data related to the system. These records also provided information about the number and location of maintenance holes and catch basins per pipe segment and the two data sets were linked via their street (location) information. The cost of maintenance holes and catch basins were rolled up into the installation and replacement values.

3.4 Roads Network Inventory

Data derived from a Roads Needs Survey (RNS), conducted by staff in 2013, was used in conjunction with the previously developed GIS layer for the Municipality’s roads. The information gathered in the Survey was reviewed, with respect to the road data, and it was determined that the road condition data contained more suitable information for use in an Asset Management Plan. It is recommended that all data sets should ideally be combined in the future to provide a more detailed source of information when combined with all other asset inventories.

3.5 Bridge Inventory

The bridge inventory was developed through the use of the most recent OSIM inspection data. Basic Bridge Condition Index values were calculated for each structure using the estimated cost of repair derived from the inspections along with the initial installation cost and the current bridge value. Bridges with a repair value either greater or close to the replacement value were considered to be in poor condition.

3.6 Miscellaneous Asset Inventories

Information for the following asset classes was acquired from various sources of data. This information assisted in providing a current and base cost for each asset.

- Street & Traffic Light Inventory
- Sidewalk Inventory
- Land, Building and Facility Inventory
- Fleet and Heavy Equipment Inventory

4. State of Local Infrastructure

4.1 Introduction & Overview

The City of Temiskaming Shores infrastructure may be considered to be generally in “good” condition. This is a result of the City being proactive in the management of its infrastructure. As the infrastructure continues to age, however, adequate funding will need to be made available to continue this trend and either replace or rehabilitate the assets as required.

4.1.1 Inventory Overview

The State of Local Infrastructure Report is a review of existing infrastructure data pertaining to infrastructure age and condition. The City’s PSAB asset registry and staff knowledge of the various categories of infrastructure forms the basis for the assessment, with any available condition information taking priority in forecasting for both short and long-term needs.

This report was developed to advance the understanding of the state of the local infrastructure assets, and to improve transparency with respect to management of the infrastructure inventory. The report is the first element of an asset management plan whose purpose is to improve infrastructure-related decision-making processes.

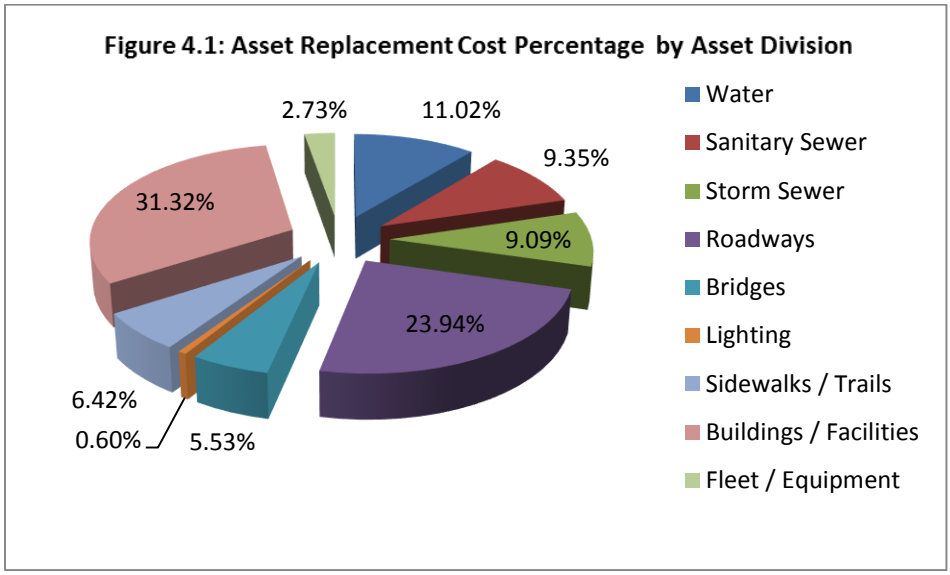
The State of Local Infrastructure Report Card reviews the following infrastructure:

- Water
- Sanitary Sewer
- Storm Sewer
- Roads
- Bridges (incl. Large Diameter Culverts)
- Lights (Street & Traffic Control)
- Sidewalks
- Buildings & Facilities
- Fleet & Heavy Equipment

Table 4-1 summarizes the estimated replacement cost for the City’s infrastructure asset portfolio, derived on the basis of replacement costs, while Figure 4-1 illustrates each infrastructure asset division as a percentage of the total portfolio value. All values are estimated construction / replacement costs represented in 2013 Canadian Dollars (CAD).

Table 4-1: Summary of Asset Inventory Replacement Costs

Asset Category	Sub-Category	Total Quantity	Replacement Cost
Water System			$34.06 M
	Mains	82.0 kilometres	
	Valves	775 each	
	Hydrants	460 each	
	Connections	3500 each	
Sanitary Sewer System			$28.89 M
	Mains	70.4 kilometres	
	Mntce. Holes	898 each	
	Connections	3500 each	
Storm Sewer System			$28.09 M
	Mains	52.3 kilometres	
	Mntce. Holes and Catch Basins	845 each	
	Drainage Ditches	468 kilometres	
Roads Network			$73.97 M
	Gravel	245.5 lane kilometres	
	Asphalt / Paved	221.4 lane kilometres	
	Surface Treatment	20.4 lane kilometres	
Bridges			$17.10 M
	Structures	9 each	
	Large Culverts	6 each	
Lights			$1.86 M
	Street Lights	1180 each	
	Traffic Lights	18 each	
Sidewalks & Active Trails	All	63.4 kilometres	$19.83 M
Buildings & Facilities	All	>100 Structures	$96.75 M
Fleet & Heavy Equipment	All	65 Various	$8.34 M



4.1.2 Infrastructure Estimated Service Life

In order to prepare asset category risk profiles, assess the state of infrastructure (in the absence of direct condition data), and create capital needs forecasts, appropriate Estimated Service Lives (or Useful Lives) have been established. Estimated Service Lives represent the number of years, from in-service or installation date, during which assets are assumed to continue to meet Level of Service expectations prior to renewal or replacement.

The Estimated Service Life can be adjusted to match industry good practices and reflect the typical life span of similar assets, to match local experience, or to match the asset management strategy of the infrastructure owner. In general, an asset's Estimated Service Life is heavily influenced by the demands placed on it, operation and maintenance practices, and legislative / regulatory and technological changes (e.g., technological obsolescence). For this Plan, the initial service lives were derived to reflect accepted industry asset performance as well as the City's asset management goals. The useful life for roads and buried infrastructure are shown in Table 4-2.

Table 4-2: Estimated Service Life for Roads & Buried Infrastructure

Material	Water	Sanitary Sewer	Storm Sewer	Road Network
Asbestos Cement	N/A	60	N/A	N/A
Cast / Ductile Iron	80	N/A	N/A	N/A
Vitrified Clay	N/A	60	60	N/A
Concrete	N/A	N/A	80	N/A
CSP	N/A	N/A	40	N/A
HDPE	N/A	N/A	75	N/A
PVC	75	75	75	N/A

Transite	50	50	N/A	N/A
Gravel	N/A	N/A	N/A	10
Surface Treatment	N/A	N/A	N/A	20
Asphalt	N/A	N/A	N/A	30

4.1.3 System Characteristic Overview

A basic character overview has been established for each asset category included in this Plan. Due to the nature of the individual asset categories, the overviews cannot be readily combined and summarized.

Beyond the risk of infrastructure failures, Temiskaming Shores faces a number of potential legislative / regulatory and potential reputational risks. One identified risk is that related to hazardous materials. A section of the water main inventory for instance, contains Asbestos Cement. A change in legislation requiring the removal of such materials could impose a cost of nearly $1.0M on the City for the Water system alone. To address these risks, the City may choose to accelerate the replacement of certain material or asset types.

4.1.4 Report Card

To rate the asset inventory using a report card, a scoring system modified from the Canadian Infrastructure Report Card was applied. The system is outlined in Table 4-3.

Table 4-3: Infrastructure Report Card Scores

Weighted Average	Rating	Definition of Rating
> 80	Very Good (A)	*Fit for the Future* – The infrastructure in the system or network is generally in very good condition, new or recently rehabilitated. A few elements show general signs of deterioration that may require attention.
79 - 70	Good (B)	*Adequate* – The infrastructure in the system or network is good condition; some elements show general signs of deterioration that require attention. A few elements may demonstrate signs of significant deficiencies.
69 - 60	Fair (C)	*Requires Attention* – The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements demonstrate significant deficiencies.
59 - 50	Poor (D)	*At Risk* – The infrastructure in the system or network is poor condition and mostly below acceptable standards, with many elements approaching the end of the expected service life. A large portion of the system demonstrates significant deterioration.
< 50	Very Poor (F)	*Unfit for Service* – The infrastructure in the system or network is in unacceptable condition with wide spread signs of advanced deterioration. Many components or elements in the system

		demonstrate signs of imminent failure, which is / will affect service delivery.

Table 4-4 summarizes the condition scores determined for each asset category, and their corresponding Grade.

Table 4-4: Infrastructure Inventory Condition Summary

Asset Category	Average Condition Score	Infrastructure Grade
Water System	63.70	Fair (C-)
Sanitary Sewer System	61.31	Fair (C-)
Storm Sewer System	49.91	Very Poor (F)
Roads Network	60.79	Fair (C-)
Bridges	63.67	Fair (C-)
Lights	56.91	Poor (D+)
Sidewalks	62.80	Fair (C-)
Buildings & Equipment	67.72	Fair (C+)
Fleet & Heavy Equipment	73.27	Good (B-)
Overall	62.23	Fair (C-)

4.2 Water Distribution System

4.2.1 Inventory Overview

The water distribution infrastructure for Temiskaming Shores includes 82 km of piping, 775 line valves and 460 hydrants. The average age of pipe in the system is 43.4 years old. The oldest pipe in the network was installed prior to 1960 and the most recent pipes in the system were installed in 2013. The age distribution of the water infrastructure is shown in Figure 4-2 and Figure 4-3.

Figure 4-2: Water System Infrastructure Age Distribution (%)

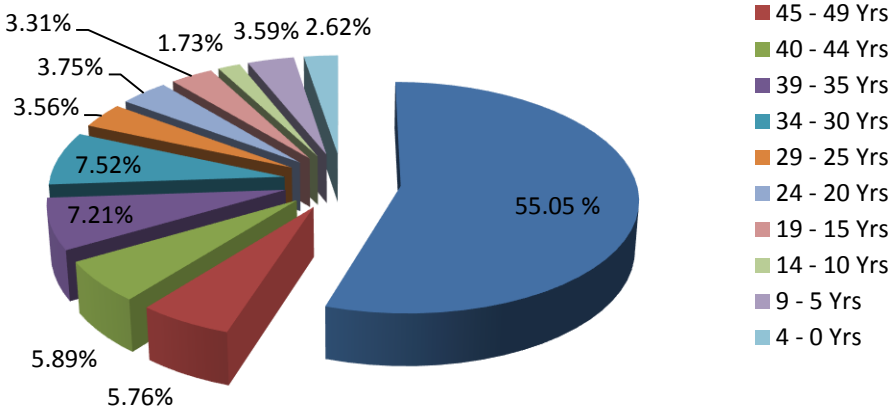
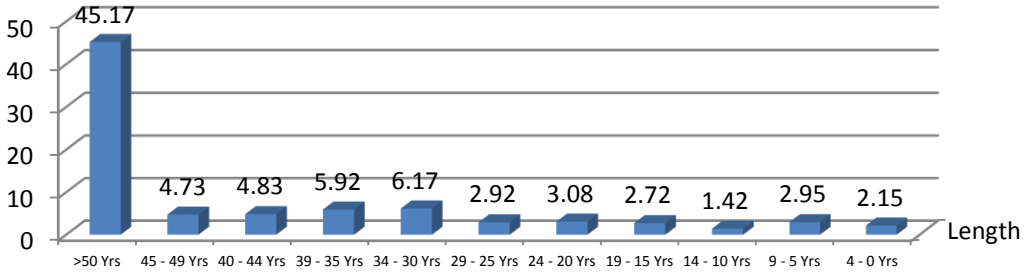


Figure 4-3: Length of Water System Infrastructure by Age (Kms.)

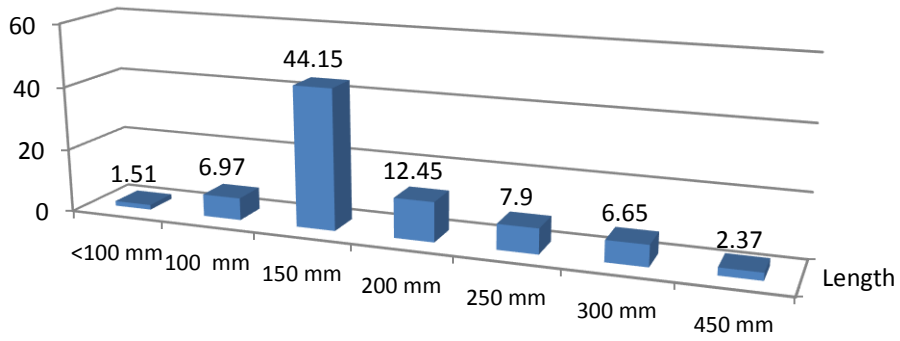


As shown in Table 4-5 and Figure 4-4, the majority of water distribution pipes in Temiskaming Shores are 150 mm diameter Cast / Ductile Iron installed over 50+ years ago.

Table 4-5: Water System Age and Material (km)

Material	0 – 9 Years	10 – 29 Years	30 – 49 Years	50+ Years	Total
Cast / Ductile Iron	--	--	11.40	45.17	56.57
Transite	--	--	3.43	--	3.43
PVC	5.10	10.14	5.30	--	20.54
Other	--	--	1.52	--	1.52
Totals:	**5.10**	**10.14**	**21.65**	**45.17**	**82.06**

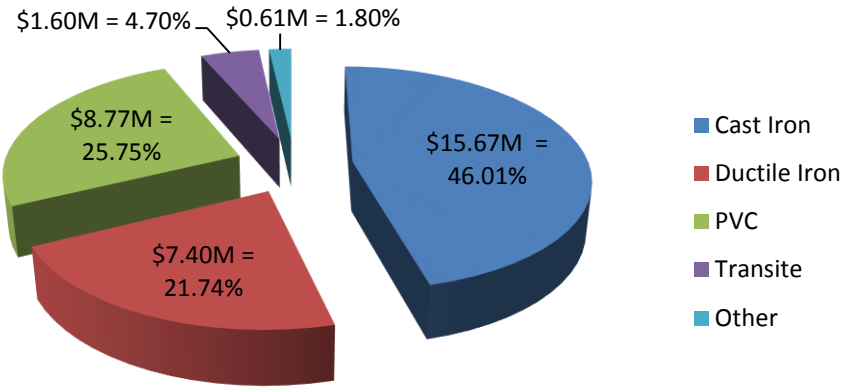
Figure 4-4: Water System Infrastructure Diameter (Kms.)



4.2.2 Financial Summary

The estimated replacement cost for the water system piping inventory is $34.06 M based on 2013 costs. The most value invested in the system is in cast / ductile iron pipe, representing nearly 68 % of the total asset category value. This translates to $23.07 M and is, on average, the oldest infrastructure installed in the network. PVC accounts for $8.77 M or 25.75% of the total water infrastructure system and would be considered the newest mains in the inventory. Figure 4-5 shows the financial distribution for the replacement of the pipes by material.

Figure 4-5: Estimated Water System Replacement Cost by Material (Million $)



4.2.3 Water System Condition Profile

Table 4-6 presents the Condition Profile for the City's water system. This initial report has considered age, material type and diameter of pipe as well as perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-6: Water System Condition Profile

Water System	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Pipe Age	25.05	30.00	18.86	18.14	7.94
Pipe Material	1.85	4.18	13.90	55.04	25.03
Pipe Diameter	1.85	8.49	29.43	37.00	23.23
Phys. Condition	18.28	36.77	26.38	12.36	6.21

4.2.4 Report Card

Table 4-7 shows the average ratings and overall report card grade for the City's water system.

Table 4-7: Water System Inventory Report Card

Pipe Age Rating	Material Rating	Diameter Rating	Condition Rating	Overall Rating
50.78	79.44	74.26	50.30	63.70

4.3 Sanitary Sewer System

4.3.1 Inventory Overview

The sanitary sewer system infrastructure for Temiskaming Shores includes approximately 70.4 km of piping. The average age of pipe in the system is 42.4 years old. The oldest pipe in the network was installed in prior to 1963 and the most recent pipes in the system were installed in 2013. The age distribution of the sanitary sewer system infrastructure is shown in Figure 4-6 and Figure 4-7.

Figure 4-6: Sanitary Sewer System Infrastructure Age Distribution (%)

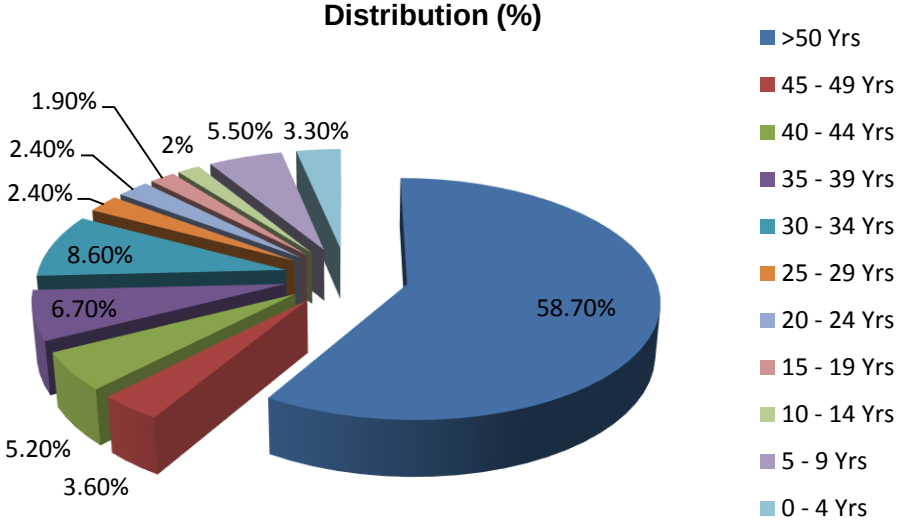
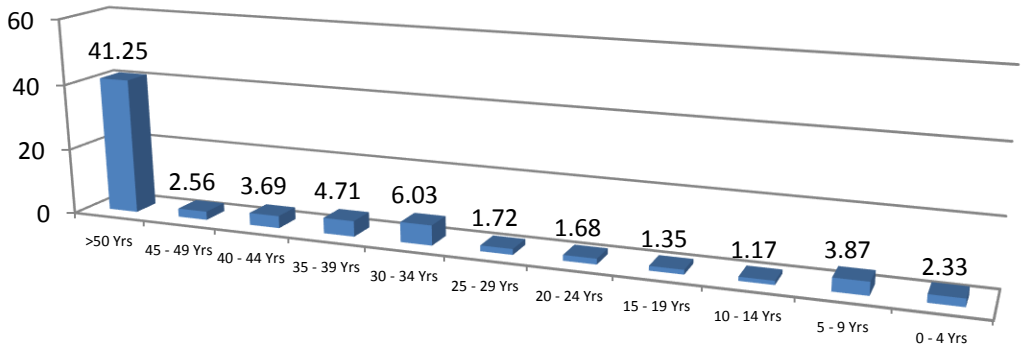


Figure 4-7: Length of Sanitary Sewer System Infrastructure by Age (Kms.)

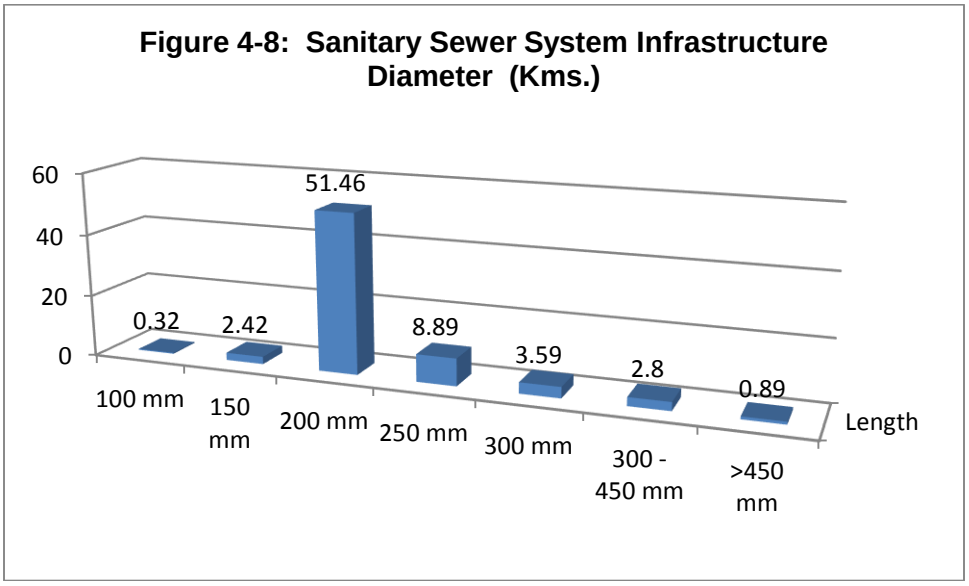


As shown in Table 4-8 and Figure 4-8, the majority of sanitary sewer pipes are 200 mm diameter comprised of Vitrified Clay or Asbestos Cement material installed over 50+ years ago.

Table 4-8: Sanitary Sewer System Age and Material (km)

Material	0 – 9 Years	10 – 29 Years	30 – 49 Years	> 50 Years	Total
Vitrified Clay	--	--	--	16.14	16.14
Transite - AC			11.18	25.11	36.29
PVC	6.20	5.07	5.81	--	17.08
Other		0.85			0.85
Totals:	**6.20**	**5.92**	**16.99**	**41.25**	**70.36**

Figure 4-8: Sanitary Sewer System Infrastructure Diameter (Kms.)

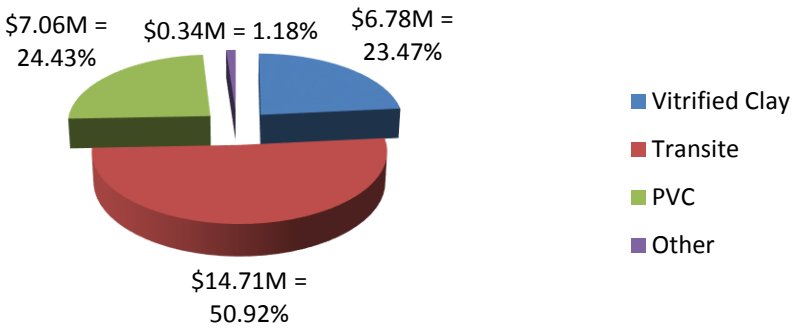


4.3.2 Financial Summary

The estimated replacement cost for the sanitary sewer system piping inventory is $28.89 M based on 2013 costs. The most value invested in the system is in Asbestos Cement (Transite) pipe, representing 50.9 percent or $23.07M of the total asset category value. This coupled with the Vitrified Clay (representing 23.47% and $6.78M in replacement costs) are considered the oldest infrastructure installed in the network.

PVC piping accounts for $7.06 M or 24.43% of the total sanitary sewer infrastructure system and would be considered the newest mains in the inventory. Figure 4-5 shows the financial distribution for the replacement of the pipes by material.

Figure 4-9: Estimated Sanitary Sewer System Replacement Cost by Material (Million $)



4.3.3 Sanitary Sewer System Condition Profile

Table 4-9 presents the Condition Profile for the City's sanitary sewer system. This initial report has considered age, material type and diameter of pipe as well as perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-9: Sanitary Sewer System Condition Profile

Sanitary Sewer System	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Pipe Age	28.7	30.0	15.5	15.3	10.8
Pipe Material	1.21	22.94	51.58	15.46	8.81
Pipe Diameter	0.45	3.44	16.29	74.59	5.23
Phys. Condition	22.94	35.69	25.36	7.20	8.81

4.3.4 Report Card

Table 4-10 shows the average ratings and overall report card grade for the Municipality's sanitary sewer system.

Table 4-10: Sanitary Sewer System Inventory Report Card

Pipe Age Rating	Material Rating	Diameter Rating	Condition Rating	Overall Rating
58.72	61.73	76.14	48.66	61.31

4.4 Storm Sewer System

4.4.1 Inventory Overview

The City of Temiskaming Shores has approximately 52.25 km of storm sewer piping located within its infrastructure portfolio. The current average pipe age is 40.8 years. The oldest storm sewer pipe was installed prior to 1963 and the most recent storm sewer pipe installed was installed in 2013. The age distribution of storm sewer infrastructure installation years is shown in Figure 4-10 and Figure 4-11.

Figure 4-10: Storm Sewer System Infrastructure Age Distribution (%)

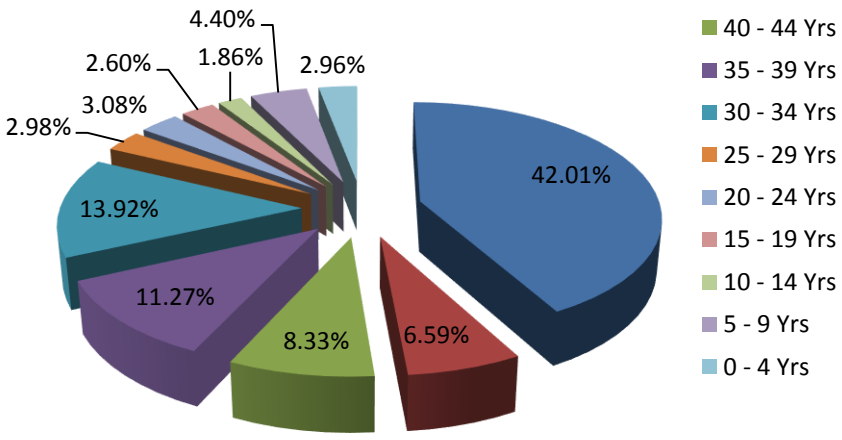
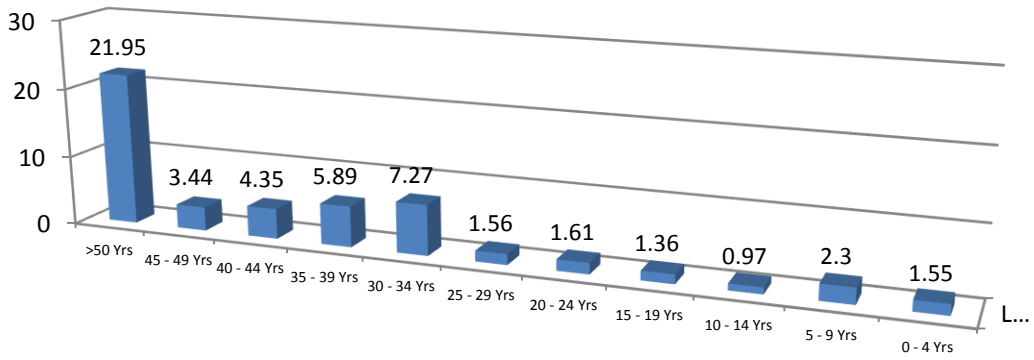


Figure 4-11: Length of Storm Sewer System Infrastructure by Age (Kms.)

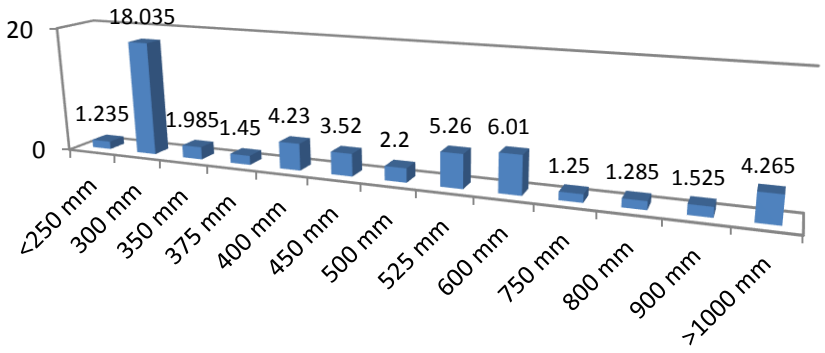


The majority of storm sewer pipes are vitrified clay with a diameter of 250 to 450 mm and installed over 50+ years ago as well as corrugated steel pipe ranging in diameter from 300 to over 1000mm also dating back from 30 to 49 years ago, as shown in Table 4-11 and Figure 4-12.

Table 4-11: Storm Sewer System Age and Material (km)

Material	0 – 9 Years	10 – 29 Years	30 – 49 Years	> 50 Years	Total
Concrete	--	--	1.25	--	1.25
Vitrified Clay	--	--	--	21.95	21.95
Transite	--	--	7.77		7.77
CSP	0.30	3.65	11.93	--	15.88
PVC	0.55	1.85	--	--	2.40
HDPE	3.00				3.00
Totals:	**3.85**	**5.50**	**20.95**	**21.95**	**52.25**

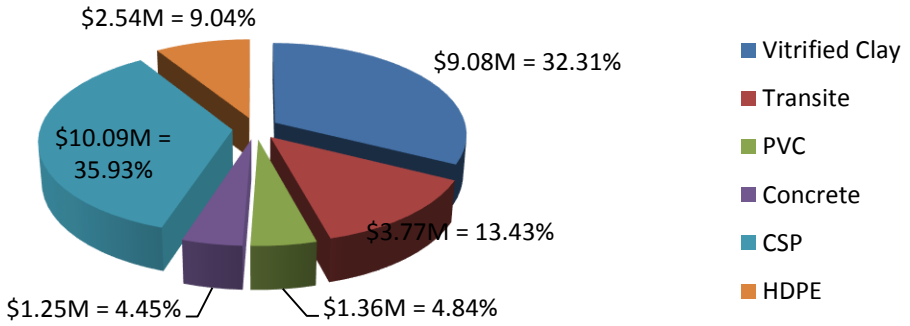
Figure 4-12: Storm Sewer System Infrastructure Diameter (Kms.)



4.4.2 Financial Summary

The estimated replacement cost for the storm sewer system piping inventory is $28.09 M based on 2013 costs. The most value invested in the system is in corrugated steel pipe, representing approximately 36 percent of the total asset category value, followed by vitrified clay at 32.3 percent. These figures translate to approximately $19.17 M of the total cost for replacement. Figure 4-13 shows the financial distribution of the pipes by material.

Figure 4-13: Estimated Storm Sewer System Replacement Cost by Material (Million $)



4.4.3 Storm Sewer System Condition Profile

Table 4-12 presents the Condition Profile for the City’s storm water system. This initial report has considered age, material type and diameter of pipe as well as perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-12: Storm Sewer System Condition Profile

Storm Sewer System	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Pipe Age	42.00	14.87	29.82	5.94	7.37
Pipe Material	42.00	14.87	30.39	4.59	8.15
Pipe Diameter	2.36	15.37	25.71	40.15	16.41
Phys. Condition	42.00	37.70	6.98	3.56	9.76

4.4.4 Report Card

Table 4-13 shows the average ratings and overall report card grade for the City’s storm water system.

Table 4-13: Storm Sewer System Inventory Report Card

Pipe Age Rating	Material Rating	Diameter Rating	Condition Rating	Overall Rating
44.36	44.40	70.58	40.28	49.91

4.5 Roads Network

4.5.1 Inventory Overview

The City of Temiskaming Shores has approximately 235 km of roadways. This includes approximately 221.37 lane kilometres of asphalt surface roadway, 20.42 lane kilometres of surface treated roadway, and 245.45 lane kilometres of gravel surface roadways as identified through the 2013 Roads Review exercise. The surface type and classification of the roads, as recorded in the City’s records, is shown in Figure 4-14 and Table 4-14.

Note: The City completes a review of the Roads Condition Study every 3 years. The information gathered in the 2013 review contained complete and accurate information about the road surface type that was correlated with the PSAB information and used for the development of this Plan.

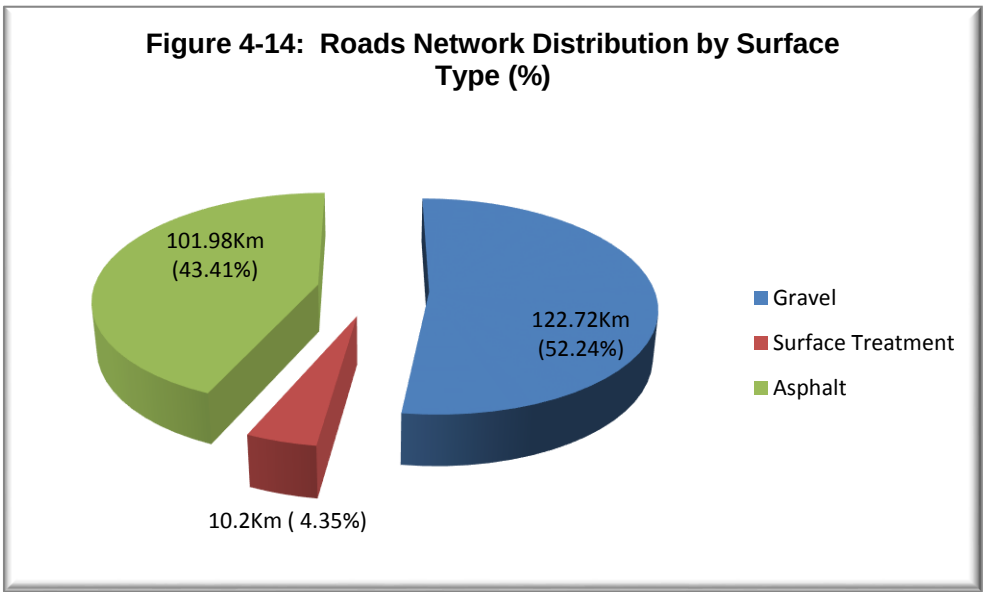


Table 4-14: Roads Network Classification and Material (Lane Km.)

Material	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Total
Gravel	-	-	-	0.20	58.45	186.80	**245.45**
Asphalt	-	15.24	48.82	74.05	76.40	6.87	**221.38**
Surface Treatment	-	-	7.80	12.22	0.40	-	**20.42**
Totals:	**0**	**15.23**	**56.63**	**86.47**	**135.25**	**193.67**	**487.25**

The age distribution of roadway network is illustrated in Table 4-15. Approximately 50 percent of the roadway network is deemed to have been constructed prior to 1963 or over 50 years ago. Approximately 32.3 percent of the roadways having asphalt surfaces have exceeded the anticipated life expectancy and are in need of replacement.

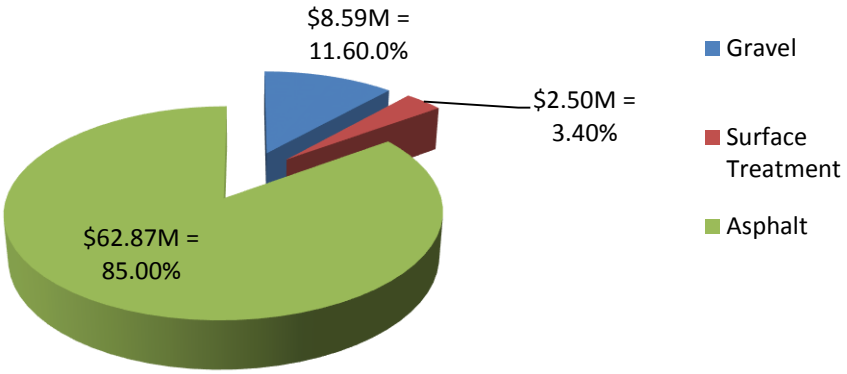
Table 4-15: Roads Network Age and Material (Lane Km.)

Material	0 – 9 Years	10 – 29 Years	30 – 49 Years	> 50 Years	Total
Gravel	4.50	2.60	47.68	190.68	245.46
Asphalt	3.00	8.60	157.32	52.45	221.37
Surface Treatment	6.42	14.00	-	-	20.42
Totals:	**14.00**	**25.20**	**204.92**	**243.13**	**487.25**

4.5.2 Financial Summary

The estimated replacement cost for the City's roadways inventory is approximately $73.97 M based on 2013 costs. The most value invested in the roadway system is in asphalt surfaces representing 85.00 percent of the total asset inventory value. This translates to $62.87M. Figure 4-15 shows the financial distribution of the roadway network by surface type. Replacement costs for gravel roads include resurfacing on a 10 year basis as well as estimated stabilization treatment and granular resurfacing prior to surface treatment application on all Class 5 and 6 roadways.

Figure 4-15: Estimated Roads Network Replacement Cost by Surface Type (Million $)



4.5.3 Roads Network Condition Profile

Table 4-16 presents the Condition Profile for the City's roadway network. This initial report has considered estimated age, surface material type, sub-surface / surface drainage and perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-16: Roads Network Condition Profile

Roadway Network	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Roadway Age	24.95	24.95	42.06	5.17	2.87

Surface Material	4.14	8.34	38.34	32.01	17.17
Drainage	10.00	15.00	20.00	30.00	25.00
Phys. Condition	15.00	25.00	30.00	20.00	10.00

4.5.4 Report Card

Table 4-17 shows the average ratings and overall report card grade for the City’s road network.

Table 4-17: Roads Network Inventory Report Card

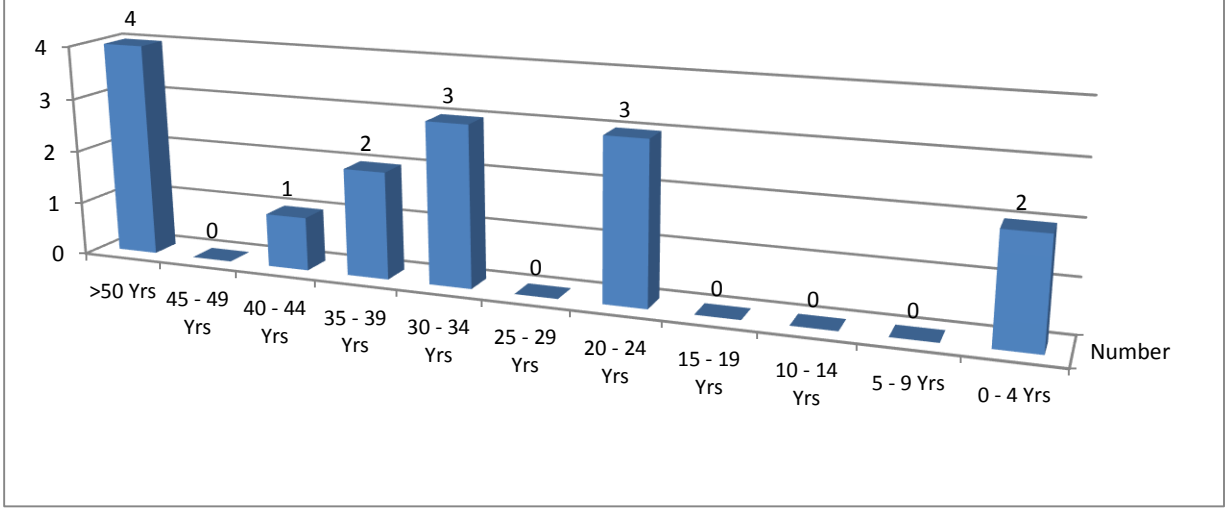
Surface Age Rating	Surface Material Rating	Drainage Rating	Physical Condition Rating	Overall Rating
47.22	69.94	69.00	57.00	60.79

4.6 Bridges

4.6.1 Inventory Overview

There are 15 bridges and large diameter culverts in the City of Temiskaming Shores. The average life expectancy of bridges built prior to 1970 is assumed to be 60 years, and bridges built after 1970 is assumed to be 75 years. Multi-plate culverts average life expectancy is assumed to be 40 years. The average age of Temiskaming Shores bridges and culverts is 35.6 years. The oldest bridge was constructed in 1944 (69 years old) and the newest bridge was constructed in 1989 (24 years old). The oldest culvert installation was constructed in 1980 (33 years old) and the newest culvert installation was constructed in 2011 (2 years old). Figure 4-16 shows the age distribution for the City’s bridges and large diameter culvert installations.

Figure 4-16: Bridge & Culvert Infrastructure Age Distribution (Age in Years)



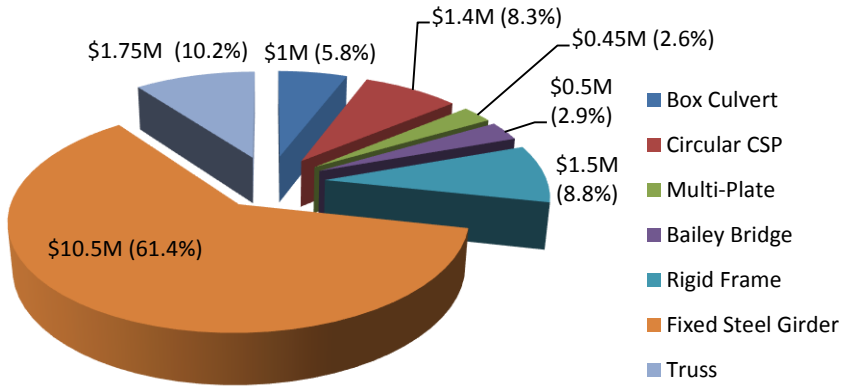
A breakdown of the bridge and culvert structures is as follows:

- 1 Concrete Box Culvert
- 4 Circular CSP
- 1 Bailey Bridge
- 1 Concrete Rigid Frame
- 6 Fixed Steel Girder
- 1 Through Truss
- 1 Multi-plate Arch CSP

4.6.2 Financial Summary

The estimated replacement cost for the bridge and culvert inventory is $17.1 M based on 2013 costs. The most value invested in the system is in Fixed Steel Girder bridges, representing 61.4 percent of the total asset inventory value. This translates to $10.5 M. Figure 4-17 shows the financial distribution of the bridges by structure type.

Figure 4-17: Estimated Bridge / Culvert Replacement Cost by Type (Million $)



4.6.3 Bridge Inventory Condition Profile

Table 4-18 presents the Condition Profile for the City's bridge and large diameter culvert inventory. This initial report has considered information gathered in the 2012 OSIM Bridge Inspection report as it relates to estimated age, material type, structure size (width / diameter) and perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-18: Bridge / Culvert Condition Profile

Bridge Inventory	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Structure Age	6.67	20.00	40.00	20.00	13.33
Structure Mat'l	26.67	6.67	13.33	6.67	46.66
Structure Size (Width / Dia.)	6.67	26.66	13.33	6.67	46.67
Phys. Condition	20.00	20.00	26.66	26.67	6.67

4.6.4 Report Card

Table 4-19 shows the average ratings and overall report card grade for the City's road network.

Table 4-19: Bridge / Culvert Inventory Report Card

Structure Age Rating	Material Rating	Size / Capacity Rating	Condition Rating	Overall Rating
62.66	68.00	68.00	56.1	63.67

4.7 Street Lights & Traffic Signals

4.7.1 Inventory Overview

The City owns a total of 969 street lights, 211 decorative lights and 5 sets (18 fixtures) of traffic signals with corresponding pedestrian crossing signals. The oldest light fixture was installed prior to 1960 and the newest installation was placed in 2013 (1 year old). The useful life for the street lighting and traffic control lights is 25 years. Figure 4-18 and Figure 4-19 shows the distribution of the lighting assets.

Figure 4-18: Distribution of Lighting Infrastructure by Type (%)

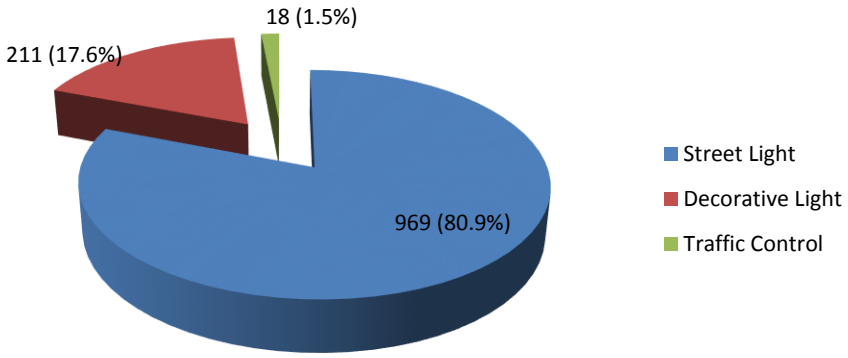
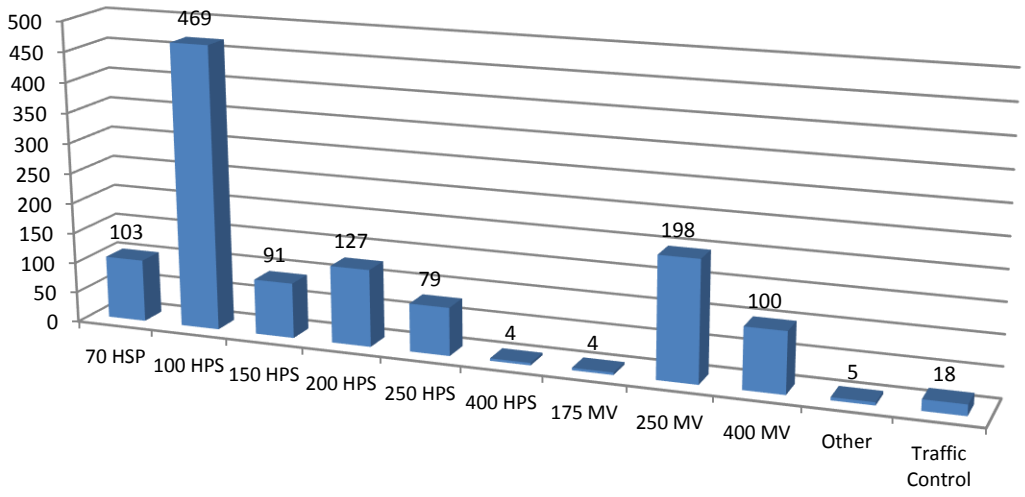


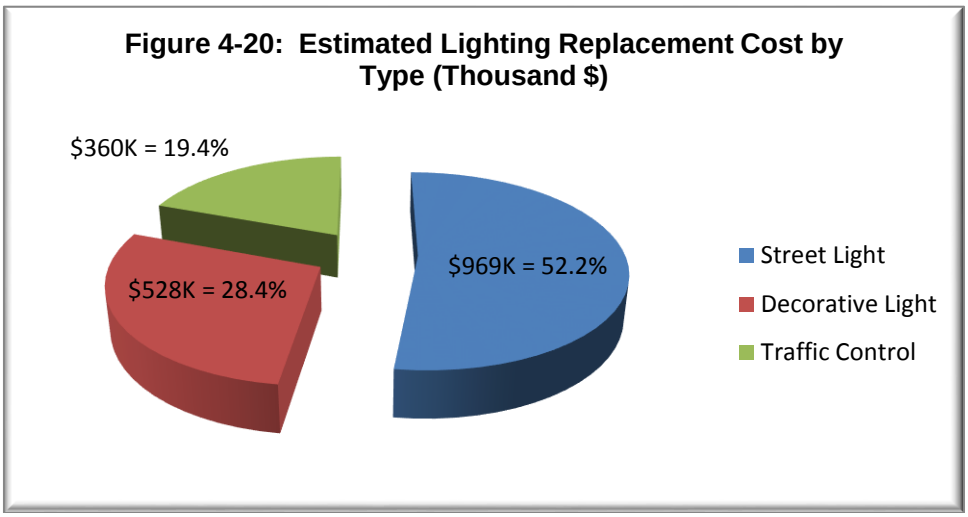
Figure 4-19: Street Light and Traffic Control Distribution (Luminaire Wattage)



4.7.2 Financial Summary

The estimated replacement cost for the street lighting, decorative lighting and traffic control lighting inventory is $1.86 M based on 2013 costs. The most value invested in the system is in Street Lighting, representing 52.2 percent of the total asset inventory value. This translates to $ 969K. Figure 4-20 shows the financial distribution of the lighting by installation type.

The City is planning to move to LED lighting through a dedicated lighting replacement program for the street lighting network. When this program is implemented, the asset database will be updated to include additional pertinent lighting system data.



4.7.3 Lighting Inventory Condition Profile

Table 4-20 presents the Condition Profile for the City's lighting infrastructure inventory. This initial report has considered information gathered in the 2013 Inventory Review as it relates to estimated age, luminaire type, luminaire size and perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-20: Lighting Condition Profile

Lighting Inventory	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2% of Total**	**0.4% of Total**	**.06 of Total**	**.08% of Total**	**1.0% of Total**
Installation Age	50.00	20.00	10.00	10.00	10.00
Luminaire Type	25.59	18.22	7.71	39.75	8.73
Luminaire Size (Wattage)	33.05	10.76	7.71	39.75	8.73
Physical Condition	10.00	10.00	10.00	50.00	20.00

4.7.4 Report Card

Table 4-21 shows the average ratings and overall report card grade for the City's Lighting Inventory.

Table 4-21: Lighting Inventory Report Card

Installation Age Rating	Luminaire Rating	Size / Capacity Rating	Condition Rating	Overall Rating
42.00	57.57	56.07	72.00	56.91

4.8 Sidewalks & Active Trails

4.8.1 Inventory Overview

The City currently owns and maintains approximately 42.6 km of sidewalks, and nearly 20.6 km of active recreational trails. Insufficient information is available regarding the specific year of construction, however, the City has been able to categorize the asset inventory by decade. Figures 4-21 and 4-22 show the estimated age distribution and classifications for the City's sidewalks and active trails.

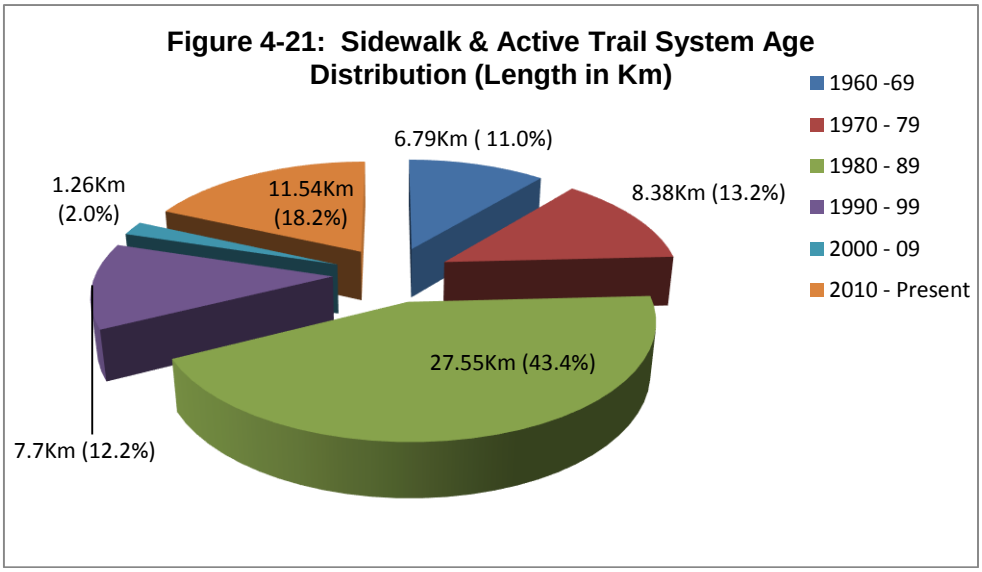
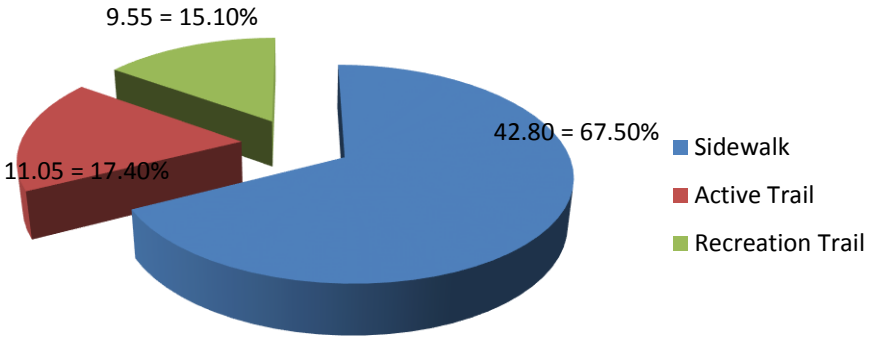


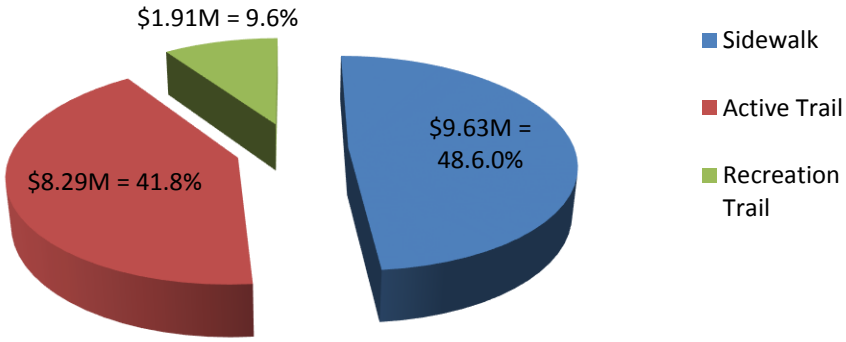
Figure 4-22: Sidewalk & Active Trail System by Type (Kms.)



4.8.2 Financial Summary

The estimated replacement cost for the City's sidewalk and active trail inventory is approximately $19.83 M based on 2013 costs. The most value invested in the system is in Sidewalks representing 48.6 percent of the total asset inventory value. This translates to $9.63M. Figure 4-23 shows the financial distribution of the walkway network by installation type.

Figure 4-23: Estimated Sidewalk & Active Trail Replacement Cost by Type (Million $)



4.8.3 Sidewalk and Trails Inventory Condition Profile

Table 4-22 presents the Condition Profile for the City’s sidewalk and trails infrastructure inventory. This initial report has considered information gathered in the 2013 Inventory Review as it relates to estimated age, surface type, surface width and perceived or reported physical condition in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-22: Sidewalk and Trails Condition Profile

Sidewalk and Trail Inventory	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Installation Age	10.74	13.25	43.57	14.17	18.27
Surface Type	10.00	20.00	30.00	20.00	20.00
Surface Width	10.00	10.00	40.00	20.00	20.00
Phys. Condition	20.00	20.00	20.00	20.00	20.00

4.8.4 Report Card

Table 4-23 shows the average ratings and overall report card grade for the City’s Sidewalk and Active Trails Inventory.

Table 4-23: Sidewalk and Trails Inventory Report Card

Installation Age Rating	Surface Type Rating	Surface Width Rating	Condition Rating	Overall Rating
63.20	64.00	64.00	60.00	62.80

4.9 Land, Buildings & Equipment

4.9.1 Inventory Overview

The City of Temiskaming Shores holds a total of 579 parcels of land, varying from 0.01 to 78.62 Ha in size. Within these parcels, the City owns and maintains approximately 106 facilities ranging from municipal buildings and community centres to environmental treatment facilities. Facility components range in age from new to over 100 years old, each with an individual estimated service life (ESL). The percentage of useful life exceeded ranges from 6% to over 265%.

Figure 4-24 and Figure 4-25 show the age distribution and estimated service life of the building assets.

Figure 4-24: Building and Facility Infrastructure Age Distribution (Age in Years)

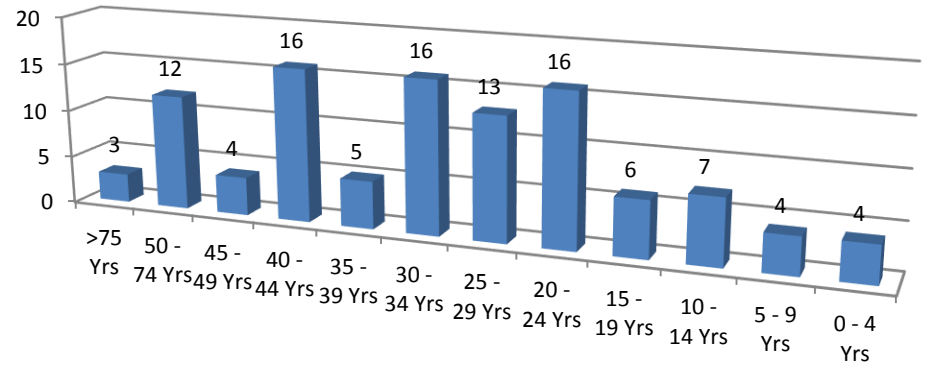
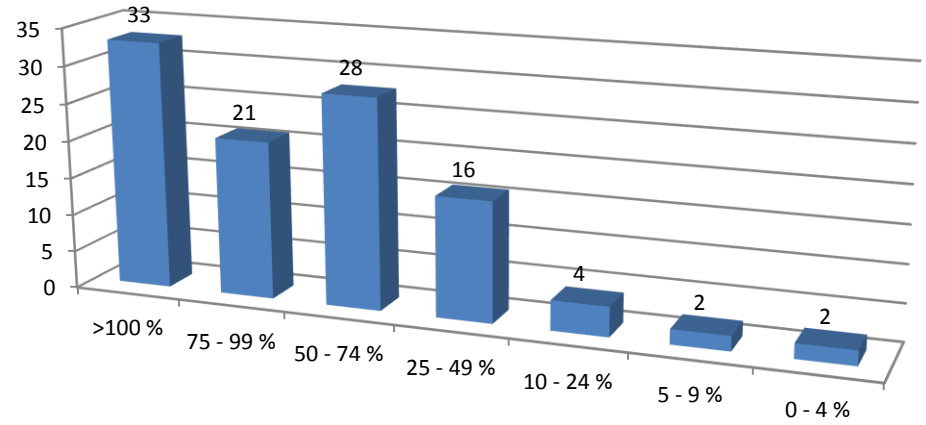
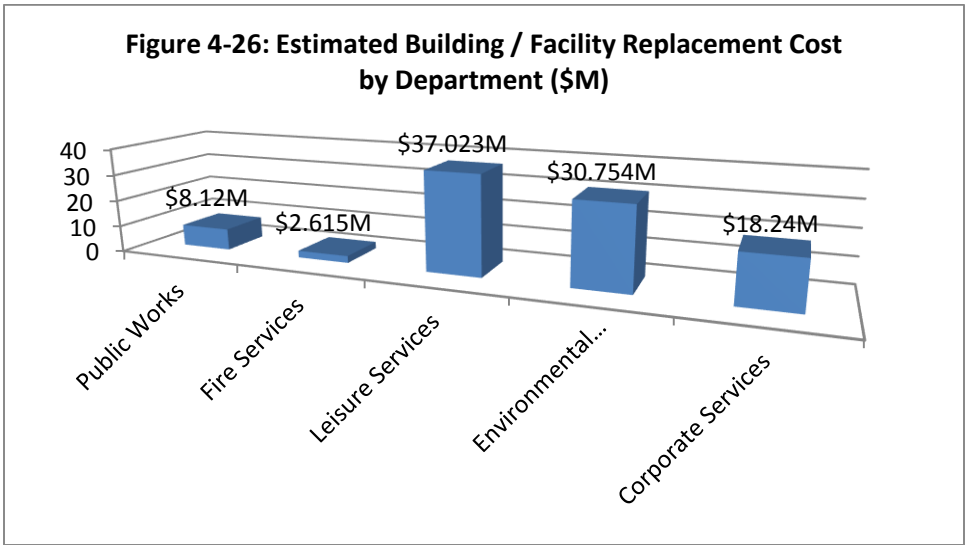


Figure 4-25: Number of Building and Facility Assets by Age / ESL (%)



4.9.2 Financial Summary

The estimated replacement cost for the City's building and facility inventory is approximately $96.75M based on 2013 costs. Leisure Services building and facilities represent an estimated 38.3% or $$37.023M of the total asset inventory value. Figure 4-26 shows the estimated replacement cost of the building and facility assets by department.



4.9.3 Buildings & Facilities Inventory Condition Profile

Table 4-24 presents the Condition Profile for the City's building and facilities infrastructure inventory. This initial report has considered information gathered in the 2013 Inventory Review as it relates to estimated age, building use, structural condition and perceived or reported physical appearance in the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-24: Building & Facilities Condition Profile

Building & Facilities Inventory	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Buildings Age	31.13	19.81	26.42	18.87	3.77
Building Use	10.00	10.00	30.00	30.00	20.00
Structural Condition	5.00	5.00	20.00	40.00	30.00
Phys. Appearance	5.00	5.00	20.00	40.00	30.00

4.9.4 Report Card

Table 4-25 shows the average ratings and overall report card grade for the City's Building & Facilities Inventory.

Table 4-25: Building & Facilities Inventory Report Card

Building Asset Age Rating	Building Use Rating	Structural Condition Rating	Appearance Rating	Overall Rating
48.87	68.00	77.00	77.00	67.72

4.10 Fleet / Heavy Equipment

4.10.1 Inventory Overview

The City of Temiskaming Shores controls 65 fleet / heavy equipment assets, each with type with an individual estimated service life (ESL). The average age of the City's fleet is approximately 11.7 years. Table 4-26 summarizes the number of fleet assets by department. Figure 4-27 and Figure 4-28 illustrates the number and distribution of fleet assets by age.

Table 4-26: Number of Fleet Assets by Department

Department	Number of Fleet Assets	Average Age (Yrs.)
Fire Services	SUV's – 2 Rescue / Support – 3 Pumper / Tankers – 7	8 years 15 years 14 years
Leisure Services	Light Duty – 4 SUV's – 1 Ice Resurface Machine – 3 Mower / tractor – 4	7 years 8 years 8 years 4 years
Community Growth & Planning Services	Light Duty - 2	2 years
Corporate Services	Cemetery Tractor – 2 Cemetery Mower – 2	19.5 years 5 years
Environmental Services	Light Duty – 2	11 years
Public Works & Building Services	Light Duty – 8 Medium Duty – 2 Single Axle – 3 Tandem Axle – 6 Sidewalk Machine – 2 Street Sweeper – 1 Motor Grader – 5 Loader – 2 Backhoe / Loader – 3 Tractor – 1	9 years 3 years 21 years 4.5 years 6 years 8 years 20 years 10 years 13 years 43 years

Figure 4-27: Fleet & Heavy Equipment Infrastructure Age Distribution (Years)

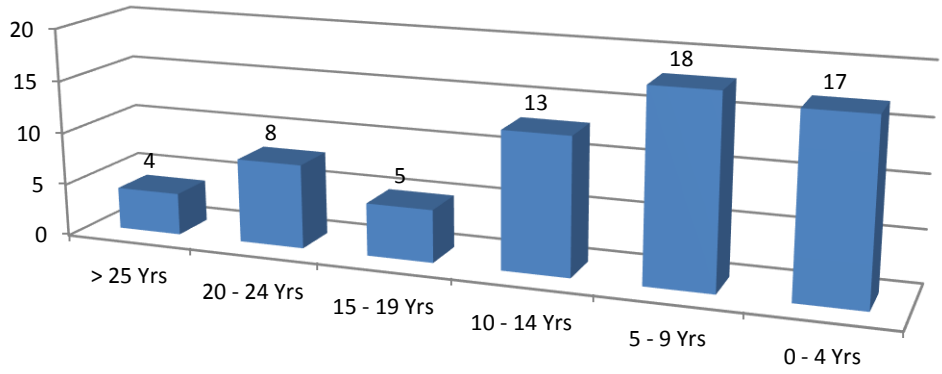
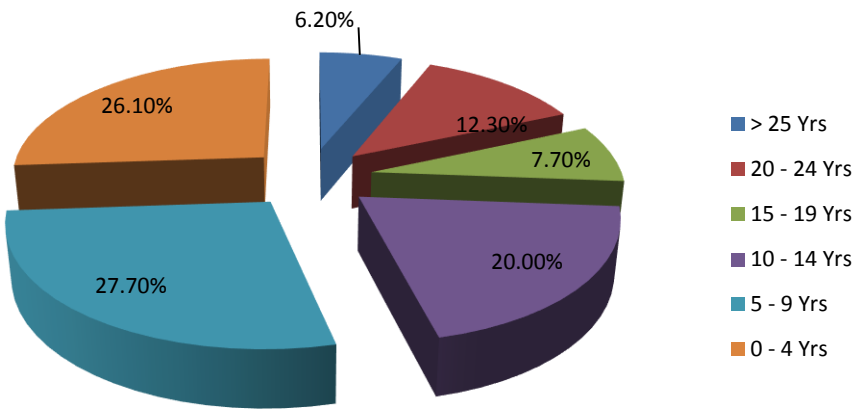


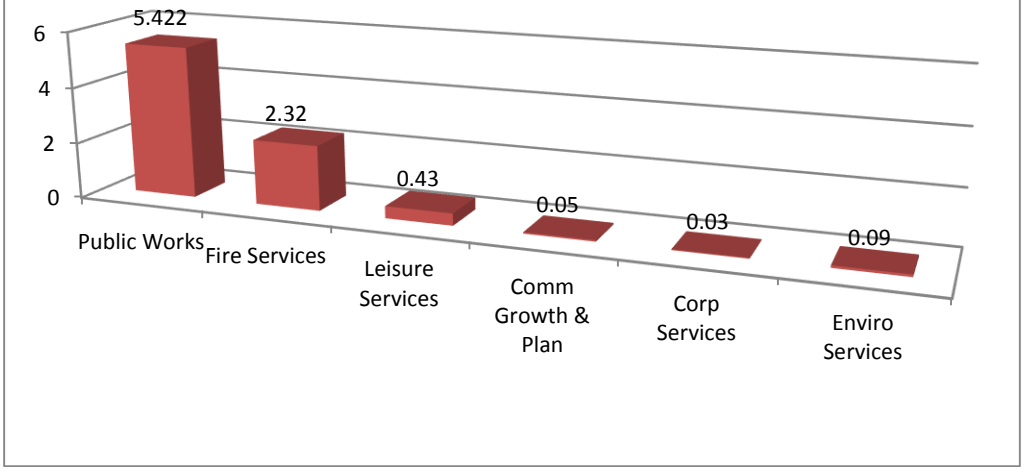
Figure 4-28: Distribution of Fleet / Equipment by Age



4.10.2 Financial Summary

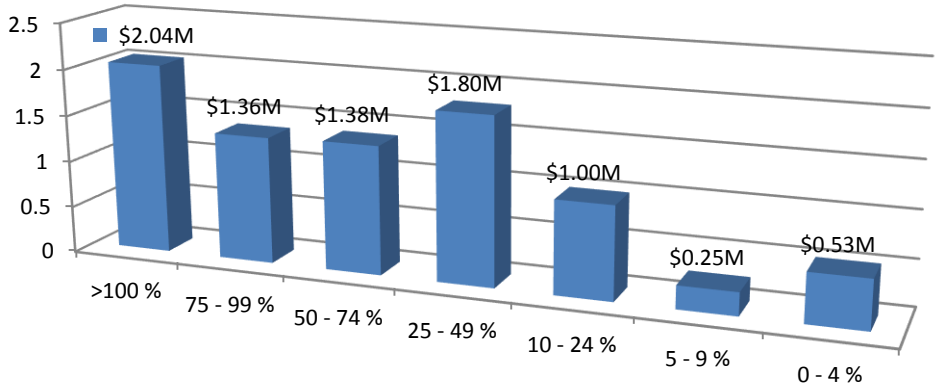
The majority of the fleet assets are held by the Public Works & Building Services (65.0 percent) and Fire Services (27.8 percent) departments. This corresponds to roughly $7.74M of the total asset replacement value of $8.34M. Figure 4-29 shows the fleet and heavy equipment asset inventory replacement cost broken down by department.

Figure 4-29: Estimated Fleet Replacement Cost by Department ($M)



Based on the 2013 review of the fleet and heavy equipment inventory data, approximately 18.3 percent of the assets have met or exceeded their estimated service life. This, and the corresponding replacement cost, is illustrated in Figure 4-30.

Figure 4-30: Replacement Value of Fleet and Equipment Assets by Age / ESL (%)



4.10.3 Fleet and Heavy Equipment Inventory Condition Profile

Table 4-27 presents the Condition Profile for the City's fleet and heavy equipment infrastructure inventory. This initial report has considered information gathered in the 2013 Inventory Review as it relates to equipment age, intended use, mechanical condition and perceived or reported serviceability of the assessment. These values may be adjusted as appropriate, as more information is gathered, or as the City upgrades the asset.

Table 4-27: Fleet & Heavy Equipment Condition Profile

Fleet & Heavy Equipment Inventory	Very Poor	Poor	Fair	Good	Very Good
Weight	**0.2 % of Total**	**0.4 % of Total**	**0.6 % of Total**	**0.8 % of Total**	**1.0 % of Total**
Equipment Age	6.15	12.31	7.70	47.69	26.15
Intended Use	10.00	15.00	15.00	20.00	40.00
Mechanical Condition	15.00	20.00	15.00	20.00	30.00
Serviceability	5.00	10.00	10.00	35.00	40.00

4.10.4 Report Card

Table 4-28 shows the average ratings and overall report card grade for the City’s Fleet & Heavy Equipment Inventory.

Table 4-28: Fleet & Heavy Equipment Inventory Report Card

Equipment Age Rating	Intended Use Rating	Mechanical Condition Rating	Serviceability Rating	Overall Rating
75.07	73.00	66.00	79.00	73.27

5. Desired Levels of Service

5.1 Introduction

Desired levels of service are high level indicators, comprised of many factors that, as listed below, establish defined quality thresholds at which municipal services should be supplied to the community. They support the organization’s strategic goals and are based on customer expectations, statutory requirements, standards, and the financial capacity of a municipality to deliver those levels of service.

Levels of Service are used:

- to inform customers of the proposed type and level of service to be offered;
- to identify the costs and benefits of the services offered;
- to assess suitability, affordability and equity of the services offered;
- as a measure of the effectiveness of the asset management plan
- as a focus for the AM strategies developed to deliver the required level of service

In order for a municipality to establish a desired level of service, it will be important to review the key factors involved in the delivery of that service, and the interactions between those factors. In addition, it will be important to establish some key performance metrics and track them over an annual cycle to gain a better understanding of the current level of service supplied.

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

The City of Temiskaming Shores target Levels of Service have been linked to Council's vision, goals and objectives for infrastructure assets as presented in Section 2, *Asset Management Policy,* of this Plan and include the key factors listed below.

5.2 Key Factors that Influence Level of Service

- Strategic and Corporate Goals
- Legislative and Regulatory Requirements
- Expected Asset Performance
- Community Expectations
- Availability of Finances

5.2.1 Strategic and Corporate Goals

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

5.2.2 Legislative and Regulatory Requirements

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

5.2.3 Expected Asset Performance

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

5.2.4 Community Expectations

Levels of services are directly related to the expectations that the general public has from the infrastructure. For example, the public will have a qualitative opinion on what an acceptable road looks like, and a quantitative one on how long it should take to travel between two locations. Infrastructure costs are projected to increase dramatically in the future, therefore it is

essential that the public is not only consulted, but also be educated, and ultimately make choices with respect to the service levels that they wish to pay for.

5.2.5 Availability of Finances

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

5.3 Key Performance Indicators

Performance measures or key performance indicators (KPIs) that track levels of service should be specific, measurable, achievable, relevant, and time bound (SMART). Many good performance measures can be established and tracked through the CityWide suite of software products. In this way, through automation, results can be reviewed on an annual basis and adjustments can be made to the overall asset management plan, including the desired level of service targets.

In establishing measures, a good rule of thumb to remember is that maintenance activities ensure the performance of an asset and prevent premature aging, whereas rehab activities extend the life of an asset. Replacement activities, by definition, renew the life of an asset. In addition, these activities are constrained by resource availability (in particular, finances) and strategic plan objectives. Therefore, performance measures should not just be established for operating and maintenance activities, but also for the strategic, financial, and tactical levels of the asset management program. This will assist all levels of program delivery to review their performance as part of the overall level of service provided.

This is a very similar approach to the “balanced score card” methodology, in which financial and nonfinancial measures are established and reviewed to determine whether current performance meets expectations. The “balanced score card”, by design, links day to day operations activities to tactical and strategic priorities in order to achieve an overall goal, or in this case, a desired level of service.

The structure of accountability and level of indicator with this type of process is represented in the following diagram, modified from the InfraGuide’s best practice document, “Developing Indicators and Benchmarks” published in April 2003.

Level of Indicator	Municipal Structure
Strategic	Council & City Manager
Tactical	Director of Public Works
Tactical & Operational	Mngr. Physical Assets & Compliance Officer
Operational	Transportation & Environmental Divisions

As a note, a caution should be raised over developing too many performance indicators that may result in data overload and lack of clarity. It is better to develop a select few that focus in on the targets of the asset management plan.

Outlined below for each infrastructure class is a suggested service description, suggested service scope, and suggested performance indicators. These should be reviewed and updated in each update of the Asset Management Plan.

5.3.1 Transportation Services

The city’s transportation network comprises approximately 488 lane kilometres of roadway, 9 bridges, 6 large culverts, sidewalks, signs, traffic signals and street lights. Together, this infrastructure enables the municipality to deliver transportation and pedestrian facility services and give people a range of options for moving about in a safe and efficient manner.

5.3.1.1 Scope of Services

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

5.3.2 Performance Indicators

Strategic Indicators	▪ Percentage of total reinvestment compared to asset replacement value ▪ Completion of strategic plan objectives (related to transportation)
Financial Indicators	▪ Annual revenues compared to annual expenditures ▪ Annual replacement value depreciation compared to annual expenditures ▪ Total cost of borrowing compared to total cost of service ▪ Revenue required to maintain annual network growth
Tactical Indicators	▪ Percentage of road network rehabilitated / reconstructed ▪ Value of bridge / large culvert structures rehabilitated or reconstructed ▪ Overall road condition index as a percentage of desired condition index

	▪ Overall bridge condition index as a percentage of desired condition index ▪ Annual adjustment in condition indexes ▪ Annual percentage of network growth ▪ Percent of paved road lane km where the condition is rated poor or critical ▪ Number of bridge / large culvert structures where the condition is rated poor or critical ▪ Percentage of road network replacement value spent on operations and maintenance ▪ Percentage of bridge / large culvert structures replacement value spent on operations and maintenance
Operational Indicators	▪ Percentage of road network inspected within last 5 years ▪ Percentage of bridge / large culvert structures inspected within last two years ▪ Operating costs for paved roads per lane km ▪ Operating costs for gravel roads per lane km ▪ Operating costs for bridge / large culvert structures per square metre ▪ Number of customer requests received annually ▪ Percentage of customer requests responded to within 24 hours

5.3.3 Water & Sewer Services

The city’s water distribution/treatment network comprises 82 km of water main, 460 hydrants, 775 valves and various water facilities. The sewer network comprises 70.4 km of sanitary sewer main, 898 maintenance holes and pump stations. The storm sewer network also comprises of 52.3 km of storm main, 845 catch basins and maintenance holes, 468 km of open ditches and numerous outlets.

Together, the above infrastructure enables the City to deliver a potable water distribution service, and a waste water and storm water collection service to the residents of the municipality.

5.3.2.1 Scope of Services

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

5.3.2.2 Performance Indicators

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

5.4 Data Collection

To appropriately record, track and monitor Levels of Service, the City will continue with or initiate programmes to collect the following types of information in addition to using discrete asset identifiers:

5.4.1 Water System

1. Date of break or water quality incident
2. Location of break or water quality incident
3. Cause of break or water quality incident
4. Estimated water loss
5. Pipe characteristics (diameter, material, installation year)
6. Time taken to respond to the incident
7. Time taken to return water mains back to service

5.4.2 Sanitary Sewer System

1. Date of blockage
2. Location of blockage
3. Cause of blockage
4. Pipe characteristics (diameter, material, installation year)
5. Time taken to respond to the incident
6. Time taken to return sewer back to service
7. CCTV inspection or Pipe Condition Rating

5.4.3 Storm Sewer System

1. Date of blockage or “*flooding on road”* incident
2. Location of blockage / flood (road and location on road)
3. Rainfall depth for discrete events
4. Time taken to respond to the incident
5. Time taken to return road back to service
6. Pipe characteristics (diameter, material, installation year)
7. CCTV inspection or Pipe Condition Rating

5.4.4 Roads Network

1. Road name inclusive of location (from/to)
2. Physical road characteristics (surface material, installation year)

3. Provincial road classification
4. Maintenance performed on the road (task and the date most recently resurfaced)
5. Pavement Condition survey resulting in a Pavement Condition Index (PCI)
6. Average Annual Daily Traffic (AADT) measured or reported
7. Annual operating costs for hard surface roads

5.4.5 Bridges

1. Bridge Name, Location & Provincial Bridge File Number
2. Bridge Characteristics (construction type, material, installation year)
3. Maintenance conducted on bridge (task and the date most recently repaired)
4. Bridge Condition Index (BCI) as per OSIM inspection
5. Average Annual Daily Traffic (AADT) report as per OSIM inspection
6. Detour route based on OSIM inspection
7. Bi-Annual Appraisal Reports

5.4.6 Street & Traffic Control Lighting

1. Pole location (GPS co-ordinates and Number)
2. Pole material /condition (good, fair, poor)
3. Luminaire Characteristics (arm length, bulb type and wattage, installation year)
4. Installation condition (good, fair, poor)
5. Maintenance conducted on light (task and the date most recently repaired)
6. Annual operating costs for lighting (Hydro consumption)

This information should be recorded in a database (Municipal Data Works) and reviewed annually to determine appropriateness and applicability as time and maintenance programs are carried out. It is suggested that the City consider the use of a weighted matrix, as presented in Table 5-1, to assist with the determination of future capital and maintenance programs.

Table 5-1: Sample Weighted Matrix for Sanitary Sewer System

Criteria	Detail	Range Values	Range Ratings	Units	Weighting
Install Year	Lifespan Remaining	1913 - 2013	1 - 10	Years	30%
Location	Impact of failure & area affected		1 - 10	N/A	15%

Material	Material descriptor		1 - 10	N/A	40%
Size	Impact of failure & number of connections affected	1 - 50	1 - 10	Millimetres	15%

6. Asset Management Strategy

6.1 Introduction

6.1.1 Approach

An Asset Management Strategy can be broken down into six types of planned actions:

Non-infrastructure solutions

- Actions or policies that impact the total lifecycle cost or lifespan of individual assets or asset networks.

Operations & maintenance activities

- Standard Operating Procedures and regularly scheduled inspections and maintenance.

Renewal / rehabilitation activities

- Significant repairs that improve assets’ condition and extend the useful lifespan.

Replacement activities

- Activities at the end of assets’ useful lifespan. Assets can be replaced with similar infrastructure, alternative infrastructure or non-infrastructure solutions to meet or adjust the service needs.

Disposal activities

- Activities related with the removal and safe disposal of assets upon completion of the service life, the replacement, or when otherwise no longer needed by the City.

Expansion activities

- Activities required to extend service, meet growth demands, or increase the levels of service provided.

In addition to the planned actions, the Asset Management Strategy addresses the procurement methods, and provides an overview of risks associated with the Strategy.

6.1.2 Asset Replacement Strategy Overview

The Asset Management Strategy considers the estimated unit replacement cost to forecast the capital investment required on five-year intervals in the 25 year time horizon between 2014 and 2038. Replacement costs were calculated using 2013 dollars with an inflation rate of 3 percent. Where the per unit replacement cost estimate was less than the replacement cost cited in the PSAB 3150 registry, the greater value was used.

For the initial 10 year period, infrastructure replacement has been optimized between the road network, water system, sanitary sewer system, and storm water system. Since the road network requires the most frequent capital interventions, it was used as the basis for driving the strategy. If the buried infrastructure was within 10 years of its Estimated Service Life when the road was scheduled to be rehabilitated or replaced, the capital replacement of the buried asset would be accelerated to correspond with the road intervention. The objective of this coordination of effort is to minimize disruptions to the public, while reducing overall costs by bundling activities.

To forecast the cost for replacing assets, a variety of assumptions were made as outlined in the following sections. The estimated unit costs were compared with recent, local construction costs and compared with the replacement cost estimates recorded in the City’s PSAB registry. The larger total replacement cost has been applied. This decision was made assuming that the greater value would provide a greater tolerance for errors in the estimates. Moving forward, the City will track infrastructure investments to improve the accuracy and reliability of unit replacement cost estimates as well as enable the inclusion of non-capital (operations and maintenance) expenditures in the Plan.

6.1.2.1 Water System

The following assumptions were made in estimating the per unit replacement cost:

- Quantity calculation based on a 250 m segment of water main that includes 1 intersection assumed to include 2 fire hydrants and 4 gate valves.
- The replacement cost estimate includes:
  - ✓ Excavation, supply and installation of pipe, fire hydrants and valve boxes; and
  - ✓ Excavation, supply and installation of water services to property line (15 m or 50 foot lot frontage is assumed as an overall City average, therefore 12 services are installed per 100 m).
- The replacement cost does not include removal of retired assets or provision of a temporary water main.

Table 6-1 below shows the cost to replace one meter of water main for pipe diameters used in the City of Temiskaming Shores.

Table 6-1: Replacement Cost Per Metre for Water Mains by Diameter

Water Main Diameter (mm)	Replacement Cost per Metre
150	$ 400
200	$ 425
250	$ 450
300	$ 500
450	$ 350

*Note – Pipe diameters less than 150 mm will be replaced with 150 mm water mains. Estimated cost for replacement includes all pipe, appurtenances and service connections. Pipe diameters greater than 300 are assumed to be transmission lines from source/plant to reservoir with no service connections.

6.1.2.2 Sanitary Sewer System

The following assumptions were made in estimating the per unit replacement cost:

- One maintenance hole per 125 m.
- The replacement cost estimate includes:
  - ✓ Excavation, supply and installation of pipe and maintenance hole structures; and
  - ✓ Excavation, supply and installation of sanitary sewer services to property line (15 m or 50 foot lot frontage is assumed as an overall City average, therefore 12 services are installed per 100 m).
- The replacement cost does not include removal of retired assets or diversion of existing flows.
- Sanitary Sewer depth of 2.8 to 3.0 m.

Table 6-2 below shows the cost to replace one meter of sanitary sewer pipe for diameters used in the City of Temiskaming Shores.

Table 6-2: Replacement Cost Per Metre for Sanitary Sewer Mains by Diameter

Sanitary Sewer Main Diameter (mm)	Replacement Cost per Metre
200	$ 400
250	$ 425
300	$ 450
375 - 450	$ 500
>450	$ 400

*Note – Pipe diameters less than 200 mm will be replaced with 200 mm sanitary sewer mains. Estimated cost for replacement includes all pipe, appurtenances and service connections. Pipe diameters greater than 450 are assumed to be truck mains with minimal service connections.

6.1.2.3 Storm Water System

The following assumptions were made in estimating the per unit replacement cost:

- Pipe and structure quantity calculation based on a 200 m segment of storm water pipe including 1 intersection where it was assumed an average of 2 maintenance holes, 6 catch basins and leads per segment.
- The replacement cost estimate includes:
  - ✓ Excavation, supply and installation of pipe, catch basin and maintenance hole structures.
- The replacement cost does not include removal of retired assets.
- Storm Sewer depth of 2.5 to 3.5 m.

Table 6-3 below shows the cost to replace one meter of storm water pipe for diameters used in the City of Temiskaming Shores.

Table 6-3: Replacement Cost Per Metre for Storm Sewer Mains by Diameter

Storm Sewer Main Diameter (mm)	Replacement Cost per Metre
300	$ 425
350 - 400	$ 500
450 - 500	$ 575
600	$ 650
750	$ 750
800	$ 825
900	$ 900
>1000	$ 1000

*Note – Pipe diameters less than 300 mm will be replaced with 300 mm storm sewer mains. Estimated cost for replacement includes all pipe, appurtenances and service connections where required.

6.1.2.4 Roads Network

The capital forecast for the Road Network assumed that the short-term needs (investments for the first 10 years) would follow the interventions identified in the review of the Roads Needs Study (RNS). The long-term forecast was developed utilizing PSAB records being integrated with the results from the RNS. There is some degree of risk for duplication of costs; however, this is considered a minor risk in that the accuracy of such a forecast typically decreases as the time horizon increases.

The following assumptions were made in estimating the per unit replacement cost for the long-term forecast:

Asphalt Surface

- The replacement cost estimates assumes that all existing asphalt surfaces will be replaced with asphalt.
- Asphalt depth is assumed at 100 mm for Class 2, 90 mm for Class 3 & 4 and 70 mm for all other roadways.
- Price does not include asphalt removal.
- Price is for supply, haul, place and compaction of asphalt only.
- Assumed width of lane is 3.75 m.

Using those assumptions, a projected replacement cost of $65 to $100 per square metre (depending on the roadway classification) is assumed for the long term replacement forecast.

Surface Treatment

- The replacement cost estimates assume that all existing surface treatment areas will be replaced with surface treatment.
- Surface treatment application is assumed to be double prime treatment at first application followed by a third application after year three.
- Surface treatment of existing gravel surface roadways will be carried out at a rate of no less than 3.0 kilometres per year.
- Price does not include pulverizing or grading of existing surface.
- Price is for supply, haul, place and compaction of Class 2 aggregate and emulsion.
- Assumed width of lane is 3.50 m.

Using those assumptions, a projected replacement / resurfacing cost of $35 per square metre is assumed for the long term replacement forecast.

Gravel

- The replacement cost estimates assume that all remaining gravel surfaces areas will be resurfaced every ten (10) years.
- Granular application is assumed to be 75 mm in depth.
- Price does not include pulverizing or grading of existing surface.
- Price does not include re-grading of roadside ditches prior to placement of granular material.
- Price is for supply, haul, place and compaction of Granular “A” aggregate.

- Roadway stabilization, in advance of surface treatment to be considered.
- Assumed width of lane is 3.50 m.

Using those assumptions, a projected replacement cost of $10.00 per square metre is assumed for the long term replacement forecast. An estimated cost of $20.00 per square metre is assumed for road stabilization and resurfacing prior to the placement of bituminous surface treatment.

6.1.2.5 Other Infrastructure

The following assumptions were made in estimating the per unit replacement cost:

- Assets will be replaced with like-assets.
- Replacement costs are assumed to be equal to those anticipated in 2013 or inflated historical costs, whichever is greater.

For the purposes of this report:

- Equipment assets required for facility operation have been included with the building or facility.
- Park space, parking lots and vacant land have been included with “lands”.
- Equipment valued at over $5000 has been included in the fleet and heavy equipment inventory.

6.2 Non-Infrastructure Solution

6.2.1 Data Collection Strategies

Data Collection Preparation

A meeting should be arranged shortly prior to, or as part of collection projects, in order to determine what information is to be updated or augmented, what information is currently available and what the condition is of that information. To facilitate this, an initial data review should be conducted of available data related to the collection exercise. Sources of information should include but not be limited to:

- Infrastructure master plans
- Water & sewer models
- Engineering as-built or record drawings
- Planning studies
- Paper maps
- AutoCAD drawings or GIS files/databases

- Inspection reports
- Imagery

These data-sources should be integrated into a single source appropriate for the data collection exercise. It is generally good practice to house this information in a database. If field staff are performing the data collection using a digital collector (GPS, tablet etc.), where possible, the database should be loaded onto this device so that updates can be made directly. The data schema and populated database should be reviewed prior to commencement of collection and be returned for review and QA/QC after collection. A data gap analysis will then be performed that will assess the level of effort required to complete the inventory and identify any assumptions to be made. It is important to note that the completeness and accuracy of the inventory is based on the available existing information, staff knowledge and the visibility of above ground assets. If possible and acceptable, some data may be synthesized based on existing data, but must be flagged as such in the database. Only after all available data-sources have been exhausted should field collection be considered.

Field Data Collection

After all pertinent and available information has been compiled, verified and audited (with appropriate reporting), a field data collection task may be necessary to determine additional or still missing information. A meeting will be held to determine the level of detail required and final use of the information. This will include confirmation and sign-off of the proposed data-model, as well as a detailed list of assets to be collected and what information about those assets is to be collected (overall schema). Sign-off will also be obtained if any special access is required on-site as well as any safety equipment required. All tools to be used in the data collection will be presented to the client at this time.

The field crew supervisor will ensure that all field members are aware of their duties and responsibilities. It is vital that appropriately trained field staff be used, particularly if inspections requiring sign-off are required. Inspection forms will be pre-populated if possible. Each field crew member will be responsible for the entirety of their work. If possible, a small pilot area should be completed and submitted for comment.

Once all field data has been collected, it will be compiled within the agreed upon schema and QA/QC’d for quality, standardization and normalization. Once this is complete, the database will be reviewed at a follow up meeting to discuss the results and further requirements.

6.2.2 Data Management Strategies

Information that is collected by the Municipality represents a significant investment of staff time and resources. Proper information and data management processes and procedures are vital to an organisation’s ability actively and effectively make use of available resources to provide an appropriate level of service to their customers as well as prepare required reports for auditing and financial purposes such as PSAB 3150 reporting. It is therefore critical that this

information be regularly maintained to ensure the integrity of the information and allow for improved decision making and management of the Municipality’s assets. The ability to rely on information is expected to become even more crucial as future Provincial and Federal funding programs become contingent on the accuracy of collected data.

While the City of Temiskaming Shores has a wealth of information available, the development of this Plan has highlighted the need for a more robust and streamlined data management strategy. At its core, a proper data management strategy can be broken down into four primary questions:

- What data should I be collecting and why?
- How should I store this information once collected?
- How often should I review my collected data and how should I maintain it?
- Are there any software / hardware applications available to me that will not only allow me to collect, store and maintain this information but also allow me to use this information to answer questions?

To effectively manage the infrastructure data, the Municipality will adopt a Data Management Policy in line with the following policy statement:

> *It should become the policy of the Municipality to manage their data effectively and efficiently. This should be done through the use of appropriate computerized applications and databases and the collection and storage only of information that has an immediate use and / or answers an immediate business need as required of the Municipality.*
>
> *This data will be maintained on a regular schedule for each individual dataset by general agreement or Government mandate.*
>
> *Metadata defining what data has been collected is available and describing the data in terms of what it represents and how current it is will also be provided.*

Once an appropriate data model has been determined and agreed upon, the City will create a schedule to determine who will be responsible for each primary data set, how often this information will be reviewed and how often new collections will be done. This information should be recorded as part of the asset information as metadata so that users know how current the information is.

It should be noted that some information may be acquired from other Agency sources such as the Canadian GeoBase (http://geobase.ca). This is a free data source that includes the National Road Network which is maintained by the Federal and Provincial governments. Sources such as this may be used to reduce the time required to maintain key datasets.

6.2.3 Information Storage Strategy

How information is stored is as important if not more so than the information itself. The reason for this is that information storage often dictates not only how easily or quickly information may be accessed and used, but also how it is used in terms of formatting etc.

It is recommended that the City adopt a relational database model for the storage of collected information. Ideally, the City would be able to house all information within a single database structure. Practically though, certain key systems such as finance and taxation are required to be contained within their own systems. This does not preclude however the ability to link information between applications.

The primary advantages of storing information using a database model are that agreed upon data standards are enforced and the duplication of information is reduced or eliminated ensuring that staff use the same information. Examples of this would include street name lists, address lists, assessment role numbers (ARN’s) etc.

6.2.4 Software / Hardware Strategy

Software and hardware are often seen and promoted as “solutions.” However, they should really be viewed as tools to assist in providing core functions required by City staff.

Databases

As discussed above, database technology is strongly recommended to assist in the storage and retrieval of information. Common applications such as MS Excel can link to a database to retrieve information and provide statistical and empirical evidence and graphs. Databases also excel as interacting with each other such that information can be passed from one system to another relatively easily. Lastly, databases often act as what is termed a “back end” to front facing applications such as finance and taxation systems, asset and customer management systems, maintenance management systems and geographic information systems (GIS).

As discussed above, it is recommended that the City consider a detailed review of enterprise database applications such as Microsoft SQL Server, Oracle, MySQL, PostgreSQL or similar products.

Asset Management

Asset management has become a major concern in recent years for several reasons. Municipalities are aware that much of their above and below ground infrastructure is on the decline. Financial responsibilities have required municipalities to make due with less. Provincial and Federal funding is now being linked to a municipality’s ability to show evidence of need (PSAB 3150 reporting).

Asset Management applications take the information that is collected and provided about an asset and assist with the decision making process to allow staff to determine what course of action to take regarding an asset and when.

Maintenance Management

A maintenance management system can assist with the tracking of work performed against specific assets. The detail to which activity is tracked may vary to include costing and time / resources require or may be more general that an activity was performed. This information may be aggregated at regular intervals to assist with establishing a base line for how well an asset is performing.

6.3 Operations & Maintenance Activities

The City of Temiskaming Shores currently has several infrastructure condition monitoring and assessment programs in place, including:

Sanitary and Storm Sewer CCTV program

The entire Sanitary and Storm Sewer systems are inspected under a seven year program. Each year, a selection of the pipes are flushed and inspected. Defects are recorded and coded to correspond with PACP standards. Once complete, this will form the benchmark for comparing asset condition. Moving forward, it is recommended that consideration be given to prioritizing the inspection according to the expected deterioration of the system.

Road Needs Study

The Roads Needs Study (RNS) is completed every 5 years utilizing internal forces. The last RNS review was completed in 2013. The study reviews the road network, broken down into sections consistent in their characteristics, and records a variety of performance and condition details for each. This information is used to identify the capital and maintenance needs of the system, the timing for the interventions, and the road priority.

OSIM Bridge Inspections

The Province of Ontario legislates that every bridge be inspected under the Ontario Structure Inspection Manual (OSIM) every two years. From this inspection, a Bridge Condition Index (BCI) is developed that helps to schedule bridge maintenance and upkeep. Safety concerns are to be addressed immediately. The last OSIM Inspection was carried out in 2012.

Due to limitations of this project, costs associated with the operations and maintenance activities have not been included in the asset management strategy. In subsequent updates to of this Plan, the City will incorporate estimates for this work.

6.4 Renewal / Rehabilitation Activities

As the City increases the availability of condition data, the Plan will be revised to reflect this information. By monitoring condition data over time, the City will improve their ability to forecast deterioration and identify trends.

Understanding that the information driving the replacement activities is based on asset age, where appropriate, the City will augment the Plan with asset inspections to determine if renewal / rehabilitation is possible prior to replacement of the assets.

Priority projects identified within the City's Renewal/Rehabilitation Activities are shown in following section.

6.4.1 Priority Renewal/Rehabilitation Activities

6.4.1.1 Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Various Locations (NL & Hlby)	Water Valve & Valve Box Rehabilitation	$150,000
Various Locations (NL & Hlby)	Fire Hydrant Rehabilitation	$200,000
Various Locations (NL & Dym)	Corrosion Protection Program	$100,000

6.4.1.2 Sanitary Sewer System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Various Locations (NL & Hlby)	Re-building of maintenance hole structures	$150,000
Various Locations (NL & Hlby)	Re-lining of existing sanitary sewer mains	$200,000

6.4.1.3 Storm Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Various Locations (NL & Hlby)	Re-building of maintenance hole structures	$150,000
Various Locations (Dym & Hlby)	Ditch revitalization (Re-establish drainage of sub-base and ditches in rural areas)	$250,000

6.4.1.4 Road Networks

Location / Corridor	Project Scope	Est. Investment

		Required (2013 $)
Lakeshore Road South from Dickson Creek to Radley Hill Road **(Completed to Cottage Road)**	Culvert Re-lining, Resurfacing & Rehabilitation	$850,000 **($600K spent in 2015)**
King Street from Morissette Dr. to Lakeview Dr.	Culvert Re-lining, Resurfacing & Rehabilitation	$1,750,000
King Street from Lakeview Dr. to Louise Street	Culvert Re-lining, Resurfacing & Rehabilitation	$2,500,000
West Road from Niven Street to Highway 11	Culvert Re-lining, Resurfacing & Rehabilitation	$1,250,000
Mowat Landing Road from Highway 11 to Firstbrook Line Road	Culvert Replacement, Resurfacing & Rehabilitation	$750,000
Tobler Road from Highway 11 to Peters Road (1.5 Km.) **(Stabilization, granular lift and ditching completed in 2014)**	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$200,000 **($95K spent in 2014)**
Peters Road from Hwy 65E to Uno Park Road	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$750,000
Armstrong Street from Wabi River to Hwy 65E	Resurfacing & Rehabilitation of Roadway Surface	$1,250,000
Petes Dam Road from Hwy 65W to Pipeline Road **(RAP placement in 2015)**	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$350,000 **($65K spent in 2015)**
Sale's Barn Road from Hwy 65E to Uno Park Road	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$750,000
Uno Park Road from Sales Barn Road to Hwy 11	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$450,000
Drive In Theatre Road from Hwy 11 to Peters Road	Resurfacing & Rehabilitation of Roadway Surface	$150,000
Golf Course Road from Hwy 11 to Hwy 65W	Culvert Replacement, Resurfacing & Rehabilitation	$500,000
River Road from Golf Course Road to Uno Park Road	Stabilize and Resurface (Surface Treatment) & Culvert Replacement	$750,000

6.4.1.5 Bridges

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
West Road (Between Ramsey Road and Fleming Road (C11)	Culvert Re-lining	$230,000
Golf Course Road Bridge (BR5)	Deck and barrier wall repairs, waterproofing and paving	$210,000
Rockley Road Bridge (BR3)	Patching, waterproofing, paving and approach settlement	$230,000
Golf Course Road Bridge (BR6)	Patching, waterproofing and paving deck.	$270,000

6.4.1.6 Street Lights & Traffic Lights

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Various Locations (3)	Audible Pedestrian Crossing Devices	$50,000
Various Locations (5)	Traffic Detection (Control) Devices	$150,000

6.4.1.7 Sidewalks / Walkways

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
King Street, Morissette Drive to Carter Blvd	Resurface Asphalt Walkway	$65,000 **(Completed in 2014 - $35K)**
Paving Stone Crosswalks, Various Location - Haileybury	Remove and Reset Stone Walkways	$85,000 **(Initiated in 2015 - $25K)**
Paving Stone Walkways, Haileybury Waterfront	Remove and Reset Stone Walkways	$150,000

6.4.1.8 Land, Buildings & Equipment

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
NL Pool Fitness	HVAC - Dehumidification	$500,000 **(Completed in 2014 - $500K)**
PW Garage No. 1, 2 & 3 **(No.2 Completed in 2014 & No.1 in 2015)**	Roof Rehabilitation	$275,000 **(To Date - $225K)**
Hlby Sewage Treatment Plant	Aeration System Upgrades	$200,000 **(Completed in 2014 - $225K)**
Shepherdson Road Reservoir	Pumps and valves Upgrades	$750,000 **(Initiated in 2015)**

NL Marina	Dock & Electrical Upgrades	$300,000 **(Completed in 2015 - $325K)**
Hlby. Service Marina & Shoreline	Stabilization and Launch Upgrades	$550,000
Wabi River Shoreline	Stabilization and Launch Upgrades	$250,000
Various Locations	Accessibility to Building Upgrades	$225,000

6.4.1.9 Fleet & Heavy Equipment

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Various Fleet & Equipment	Body and Mechanical Repairs (Extending Life)	$100,000

6.5 Replacement Activities

Priority projects identified within the City's Replacement Activities are shown in the following section.

6.5.1 Priority Replacement Activities

6.5.1.1 Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Armstrong Street / Hwy 65 from Hessle St. to Wilson Dr.*	Installation of Feeder Main from NL to Dymond system.	$500,000 **(Construction in Progress)**
Dym. / NL Distribution Integration	Connection of two supply and distribution systems	$1,500,000 **(Construction in Progress)**
McDonough Heights	Replace existing undersized distribution system	$500,000
Montgomery Street	Replace existing water main (structurally inadequate)	$250,000

6.5.1.2 Sanitary Sewer System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Gray Road Pumping Station & associated infrastructure	Replacement of piping & assoc. / conflicting buried infrastructure.	**$5,250,000** **(Revised Estimate)**

Gray Road PS to NL Lagoons	Installation of parallel forcemains	$950,000 (New Project)
Beach Gardens to Montgomery Street PS	Replacement of Sanitary Sewer main.	$440,000
Lakeshore Rd N. from Radley Hill Rd to White's Drive	Replacement of Sanitary Sewer main.	$300,000

6.5.1.3 Storm Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Broadwood Ave from Lakeshore Road to Market Street	Replacement of Storm Sewer main	$175,000 **(Completed in 2015)**
Wedgewood Street from Lakeshore Road to Market St.	Replacement of Storm Sewer main	$175,000 **(Completed in 2015)**

6.5.1.4 Road Network

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Latchford Street from Probyn Street to Lakshore Rd South	Replacement of buried infrastructure and Reconstruction of roadway. Commenced in 2013.	$4,000,000 **(Completed in 2014)**
Elm Street from Armstrong Street to Robert Street	Replacement of buried infrastructure and Reconstruction of roadway	$2,500,000
Farah Ave from Golding Street to Dixon Street	Replacement of buried infrastructure and Reconstruction of roadway	$2,250,000
Rockley Road from Highway 11 Westward for 1.1 Km	Reconstruction of roadway.	$850,000 **(To be completed in 2015)**

6.5.1.5 Bridges

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Uno Park Road Bridge **(Joint Project with Harley Twp.)**	Replacement of Structure	$1,750,000 **(Completed in 2015 - $1.95K)**
West Road, between Ramsey and Fleming Road	Culvert Replacement	$350,000
Mowat Landing Road	Culvert Replacement	$350,000

6.5.1.6 Street Lights & Traffic Lights

Location / Corridor	Project Scope	Est. Investment

		Required (2013 $)
Upgrade Street Lights, Various Locations	Upgrade to LED Luminaires	$1,000,000 **(Currently being completed $800K)**
Upgrade Decorative Lights, Various Locations	Upgrade to LED Luminaires	$500,000

6.5.1.7 Sidewalks / Walkways

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
N.L. Waterfront Boardwalk	Replace walking surface	$350,000 **(Completed in 2014 - $350K)**
Pete's Dam Trail	Replace water crossing	$125,000 **(Completed in 2015 - $110K)**
Various Locations	Accessible curb cuts and ramps	$150,000

6.5.1.8 Land, Buildings & Equipment

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Quanset Building – Lions / Bikers	Replacement of Structure	$45,000 **(Completed in 2014 - $40K)**

6.5.1.9 Fleet & Heavy Equipment

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Dymond Fire Dept.	Replacement of Pumper Unit	$340,000 **(Completed in 2015 - $340K)**
Public Works	Replacement of Sander Unit (2)	$370,000 **(Completed in 2015 - $368K)**
City Fleet	Replacement of Light Duty Vehicles (4)	$110,000 **(Completed in 2015 - $147.5K)**
Hlby Fire Dept.	Replacement of Rescue Vehicle	$250,000
Public Works	Replacement of Motor Grader (2)	$650,000
Public Works	Replacement of Wheeled Loader	$185,000

6.6 Disposal Activities

The initial version of the Plan has not identified any specific disposal activity's, however, disposal of municipal assets shall be in accordance with those procedures outlined in the Municipal Purchasing Policy and Disposal of Real Property Policy.

6.7 Expansion Activities

Priority projects identified within the Municipality's Expansion Activities are shown in the following section.

6.7.1 Priority Expansion Activities

6.7.1.1 Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Niven Street South, Hlby. Water Reservoir to North Cobalt	Looping of water supply to residential area	$2,500,000
Dawson Point Road, McKelvie Ave. to Peters Road *	Extension to supply proposed Subdivision	*N/A (By Developer)

6.7.1.2 Sanitary Sewer System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Dawson Point Road, McKelvie Ave. to Peters Road *	Extension to supply proposed Subdivision	* N/A (By Developer)
Elm Street at Robert Street	Construction of Lift Station & Forcemain, to alleviate bypass events and sewer back ups in area	$2,500,000

6.7.1.3 Storm Water System

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Rockley Road at Hwy 11 and Hawn Drive	Storm Water Management System	$450,000 **(Completed in 2014 - $475K)**

6.7.1.4 Road Network

Location / Corridor	Project Scope	Est. Investment Required (2013 $)

Wilson Road, Grant Drive to Hwy 65E	Extension of roadway to alleviate traffic concerns	$750,000
FTP Subdivision Roadway *	Roadway construction (26 lot Subdivision)	N/A (By Developer)

6.7.1.5 Bridges

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Fleming Road, between West Road and Hwy 11	Culvert Re-instatement (Previously damaged and road closure in place)	$350,000

6.7.1.6 Street Lights & Traffic Lights

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Riverside Drive	Extension of walkway lighting (Decorative)	$100,000

6.7.1.7 Sidewalks / Walkways

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Active Trail (STATO) *	Extension to existing recreational trail	$250,000 (Cost Shared with Committee)

6.7.1.8 Land, Buildings & Equipment:

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Farmer's Market Pavilion	Construction of all season facility	**$350,000** **(Revised Estimate)**

6.7.1.9 Fleet & Heavy Equipment

Location / Corridor	Project Scope	Est. Investment Required (2013 $)
Public Works	Sidewalk Maintenance Equipment (Additional)	$185,000

6.8 Risks

The City’s overall Asset Management Strategy is founded on available data, anticipated service levels, growth expectations and other assumptions. Assumptions in these items introduce some unavoidable risk that the overall strategy may change over time as the City gathers and develops more complete data and processes.

Recognizing these uncertainties, the City 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
- Levels of Service
- Growth – expected vs. actual
- Assumptions

Data quality

The data provided and collected for the report for various aspects were given only reflecting a very high level of the asset components, and did not accurately reflect the service life’s of the necessary components of the assets (i.e. a water treatment plant was assessed at a facility level and did not have age, conditional, performance, or maintenance data for any of the facilities components (i.e. SCADA system, pumps, etc.). Given the high level of the data, significant risk exists in the component asset life reaching the end of their respective service lives before the facility has reached the end of the facility life. This introduces significant difficulty to establish a yearly budget that accurately would reflect the required asset replacement / rehabilitation cost required.

Strategy to address:

It is suggested an inspection program of assets be established to utilize the new workflow structure and build the existing database. With a newly built database, the report should be reviewed and see if the new data produces significant changes to the asset management strategy.

Levels of Service

The levels of service present a risk, since no previous levels of service were established for the township. The Levels of Service therefore have never been measured in previous years and the expectation 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 City, but risk exists if a level of service is set at a higher expectation then 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 strategy should be investigated.

Growth Levels

Growth forecasts are not guaranteed, and while effort has to be made to ensure that services are provided if the growth is met, growth can be greater or lesser then the expected forecast. This can potentially create a surplus or deficit of funding available.

Strategy to address:

It is suggested that the growth of the City should be reviewed on a yearly basis to determine if the forecast is accurate, and if possible the budgets should be adjusted accordingly. The City should consider conducting a review / study of current and future housing demands within the next 2 to 3 years.

Assumptions

Assumptions have been made in the report to fill data gaps and have been noted where undertaken. As with any assumption, risk exists in that the assumption made not account for a large enough percentage of the assets and could potentially results in unexpected costs if not corrected (i.e. year of installation assumed, when the asset is past its expected service life, and due to the degradation of the asset, effecting surrounding assets).

Strategy to address:

It is suggested that an inspection program be developed utilizing the information provided herein to eliminate the largest assumptions. The new findings should then be used to adjust the report findings, correcting the asset management strategy if required.

7. Financial Strategy

The financial strategy is the final component of the Plan and it provides the plan to move forward with the Asset Management Strategy that was provided previously in this report.

Financing infrastructure needs has become a very serious issue. We need to identify better practices and innovations in infrastructure financing if the City of Temiskaming Shores and senior levels of government want to continue to provide an adequate level of service to tax payers in an affordable manner. It seems to make sense that municipal infrastructure should be financed, as far as possible, by the residents who benefit from it but, how do you determine

who should pay for the rehabilitation of an arterial or collector road going from point A to point B in large cities throughout Canada.

In addition, for the past many years, municipal accounting practices have failed to include replacement costs for depreciating assets, thereby assuring a fiscal shock when replacement time arrives. The Public Sector Accounting Board (PSAB) has changed that practice which has made municipalities realize the extent and magnitude of the infrastructure deficit. Asset managers need to come up with innovative solutions to address that infrastructure deficit. Asset management systems are part of the solutions but innovative financing and finding alternate revenue sources are an even bigger part of the solution.

Most municipalities are familiar with a variety internal and some external revenue sources. The following describes a few of those revenue sources currently used by municipalities:

7.1 Internal Revenue Sources

General Operating Revenues: Rural municipalities, towns and smaller cities tend to rely more on local taxes, user fees and grants than on borrowing, partly because borrowers view them as higher risk than larger cities, thus raising their borrowing costs.

Earmarked User Fees: An earmarked user fee is dedicated to a specific project; for example, water and sewer charges for water infrastructure, disposal fees for solid waste facilities, and admission charges for recreational complexes.

Reserves: Financing capital projects through funds set aside for capital spending is the reverse of financing through borrowing. A “capital levy” — usually a few percentage points of the local property tax — is set aside and accumulates in interest earning accounts segregated from general revenues.

Special Assessments and Local Improvement Charges: A special assessment is a specific charge added to the existing property tax to pay for improved capital facilities that border them. The charge is based on a specific capital expenditure in a particular year, but may be spread over a number of years.

Development Charges: Most large municipalities and many smaller ones impose a specific dollar value per lot on developers to finance the off-site capital costs of new development. Developers are generally responsible for on-site services, such as local roads, sidewalks, and street lighting. Historically, development charges have financed “hard” services, such as water supply, sewage treatment, trunk mains and roads. The City of Temiskaming Shores does not currently have a Development Charge By-law.

7.2 External Revenue Sources

Grants: Municipalities sometimes rely on provincial and federal government grants for infrastructure. The Municipal Infrastructure Investment Initiative (MIII) Capital Program is a

good example. In the past capital assistance has also been made available for water, sewer, and transportation projects with all three levels of government participating.

Borrowing: Municipalities engage in both short-term and long-term borrowing. Short-term borrowing may be used to finance capital expenditures or to finance an unexpected deficit in the operating budget. For infrastructure whose benefits accrue to future residents, fairness, efficiency and accountability is enhanced if these projects are financed by borrowing with repayment coming from property tax revenues and user fees paid by future beneficiaries.

There are also a few new financing instruments that have been made available to municipalities. The federal government‘s initiative to provide grants to municipalities from federal gas tax revenue is one example of a new financing instrument. The Public-Private Partnership (P3) is also a new financing instrument that may be considered by municipalities. It involves the direct participation of the private sector in a venture controlled by the public sector. The public sector‘s role is to facilitate, regulate, and guarantee provision of an asset and the private sector‘s role is to design, finance, build and operate the asset in a formalized partnership agreement.

7.3 Temiskaming Shores Financial Strategy

In **Section 6** of this report we have developed, in collaboration with staff, an Asset Management (AM) Strategy. The strategy included funding requirements that would ensure sustainability of the assets to continue to provide an adequate level of service to the residents of Quinte West. The strategy developed is realistic and affordable. The City has identified revenue sources that will support the Asset Management Plan (AMP) developed through this report. The following provides a description of the revenue sources identified by the City to support the AM Strategy. These sources include:

Municipal Surplus: The City currently transfers just over $700K per year from its general operational budget into its annual capital program. The strategy is that since this amount is built into the current tax rate that this transfer will continue to take place at least at this level going forward to continue to fund projects.

The City currently transfers just over $700K per year from its environmental (water/sewer) operational budget into its environmental capital program. The strategy is that the amount is built into the current water/sewer rates and this transfer will continue to take place at this level going forward to continue to fund projects.

Federal Gas Tax: The Federal Gas Tax Fund is a permanent source of funding for municipal infrastructure. It is predictable, long-term and stable, and is helping municipalities like Temiskaming Shores address their infrastructure deficit. The City has identified $607K of funding from the Federal Gas Tax in their Financing Strategy.

Assessment Growth: The City does not plan to take a portion of its new assessment growth (residential and commercial) and earmark it towards capital. Over the past number of years the

City has had less than $50,000 worth of assessment growth annually. The current assessment growth levels are used to support operational services and programs.

Debt: The remainder of the capital program will be financed through debt. It is anticipated that there will be more debt issued during the first 10 to 15 years of the plan. Very large infrastructure projects may be financed with the use of debt but will be contingent upon approved federal and provincial funding programs.

When you look at the City‘s current repayment limit and prevailing interest rates in the market the City of Temiskaming Shores would be able to borrow slightly more than $200 million.

Water Rates: A portion of the City‘s current water rates generates revenue that is used specifically for the replacement and upgrade of infrastructure. Council currently has a rate structure in place that sees increases through to and including 2021. The majority of the approved increases are to help fund the water infrastructure needs of the city. Over the 25 year time frame of the plan staff anticipate that an average of $1.3 million per year will be reinvested into infrastructure.

Sewer Rates: As with the current City water rates a portion of the sewer rates generate revenue for sewer infrastructure upgrades. The rate structure in place does see increases through to 2021 which the majority of will go to help fund the infrastructure needs outlined in this report. Over the next 25 years an average of $1.05 million per year will be reinvested into infrastructure needs.