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Corporation of the Township of Moonbeam

Municipal Asset Management Plan

December 31st, 2013

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Glossary of Terms

Asset management planning	Asset management planning is the process of making the best possible decisions regarding the acquisition, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective of an asset management plan is to maximize benefits, manage risk and provide satisfactory levels of service to the public in a sustainable manner.
Historical cost	Historical cost represents the actual cost incurred by the municipality at the date of acquisition. Given the timeframe between the date of acquisition and the current date, historical cost is not reflective of the replacement cost of the asset.
Replacement cost	Replacement cost reflects the cost that would be incurred in the event that the municipality was required to replace the asset at the present time in new condition.
Life cycle cost	Life cycle costs reflect the cost of all asset management activities that are recommended for the maintenance of the asset, including major periodic maintenance activities (e.g. crack sealing for paved roads), including the ultimate replacement of the infrastructure but not its initial acquisition. For the purposes of the asset management plan, life cycle costs have been expressed in current dollars and have not been adjusted for anticipated inflationary increases over the life of the assets except where noted.
Condition assessments	Condition assessment are a means of expressing the current state of the municipality's infrastructure based on three possible ratings – good, fair and poor. The determination of the ratings will vary based on the type of infrastructure involved.
Immediate infrastructure requirements	For the purposes of the asset management, immediate infrastructure requirements are capital investments that are recommended to be made within the next 10 years, based on the condition assessment of the infrastructure and the recommended life cycle activities. The immediate infrastructure requirement identified for the municipality is intended to address those assets that are currently rated as poor or expected to be rated as poor during the next ten years (due to deterioration caused by usage, weather, etc.).
Sustaining life cycle requirements	The sustainable life cycle requirement of an asset is the total of its life cycle costs divided by its estimated useful life. The sustainable life cycle requirement represents the amount of funding that should be committed to the municipality's infrastructure on an annual basis in order to fully fund the recommended life cycle activities.
Ontario Municipal Partnership Fund	The Ontario Municipal Property Fund (OMPF) is the primary Provincial mechanism for the flowing of operational grants to municipalities. OMPF funding is intended to assist municipalities that have limited property assessment, increased operating costs as a result of being northern or rural municipalities and/or are facing challenging fiscal circumstances.
Municipal Infrastructure Investment Initiative	The Municipal Infrastructure Investment Initiative (MIII) is a Provincial program designed to assist municipalities with critical road, bridge water and wastewater projects, with funding targeted to municipalities that would be unable to undertake priority projects without provincial support. While funding is available under MIII, the asset management plan does not consider any senior government grants other than those that have been secured as at the date of the asset management plan.

Glossary of Terms

Anticipated asset life cycle	The anticipated asset life cycle is the estimated productive useful life of an asset or infrastructure component. At the end of the anticipate asset life cycle, the municipality will be required to replace the asset in question, either through acquisition or reconstruction.
Integration opportunities	Integration opportunities represent potential groupings of different assets into a single project. For example, roads capital projects are often integrated with water, wastewater and storm sewer replacements given that these systems are underneath (and accessed through) municipal roads.
Rehabilitation and replacement criteria	Rehabilitation and replacement criteria are the factors considered by the municipality when consider when to undertake certain asset management activities.
Rehabilitation and replacement strategies	Rehabilitation and replacement strategies represent activities that are intended to maintain the condition and performance of the municipality's infrastructure. Rehabilitation and replacement strategies are synonymous with asset management activities.
Life cycle consequences	Life cycle consequences represent the expected outcomes in the event that the municipality does not undertake the recommended asset management activities during the recommended timeframes. Life cycle consequences can included but are not limited to deterioration of the physical condition of the asset, a reduction in the outputs and service potential of the assets, increased operating costs, higher costs for subsequent asset management activities than would otherwise have been incurred had the municipality undertaken the recommended asset management activities and/or a reduction in the estimated useful life of the asset.
Integrated asset priorities	Where different assets can be integrated into capital projects, the integrated asset priorities determine the basis for selecting and prioritizing capital projects. For example, a municipality with a water and wastewater system that is in poor condition may prioritize road construction projects based on the condition of the underlying water and wastewater system.
Infrastructure deficit	The municipal infrastructure deficit represents the amount that should be spent by the Municipality to replace or rehabilitate assets that are assessed as being in poor replacement. The infrastructure deficit will increase as the Municipality's infrastructure ages, reducing when the Municipality incurs capital expenditures.
Financing deficit	The financing deficit represents the difference between the amount of capital financing required in a given year and the actual amount of investment made by the Municipality. The financing deficit is generally larger than the infrastructure deficit as it not only includes the cost of replacing assets that are rated as poor, but also the annual contribution towards the long-term sustainable replacement of all of the Municipality's assets.

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The development of an asset management plan has been identified as a pre-requisite for the receipt of funding from the Province of Ontario (the 'Province') under the Municipal Infrastructure Investment Initiative ('MIII') and as such, represents an important first step in obtaining financing for necessary infrastructure investments. That said, planning for capital reinvestment is essential with or without the incentive provided under MIII, particularly given that a number of municipalities are now approaching end-of-useful-life for significant components of their infrastructure.

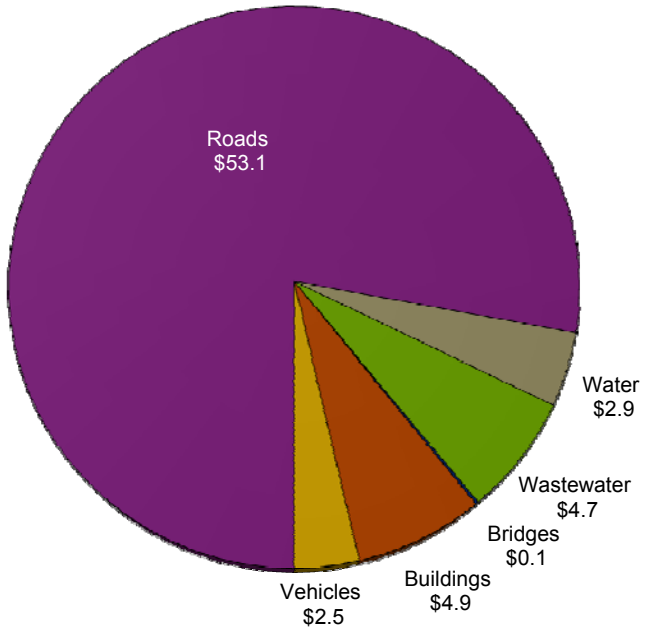
Current state of infrastructure

Infrastructure represents a major investment on the part of the Township of Moonbeam (the 'Municipality'), with the estimated replacement cost of its assets – roads, bridges, buildings, vehicles, equipment and pipes – amounting to more than $68 million, or $62,000 per resident. In addition to the cost of replacing its assets, the Municipality is also required to repair and rehabilitate its infrastructure over its entire useful life, with the cost of these life cycle activities for linear infrastructure (roads and pipes) amounting to $123 million, or $146,000 per household.

While the amounts of the Municipality's replacement and life cycle costs are significant, the real pressure from the perspective of its infrastructure comes from its current condition. Condition analysis conducted as part of the asset management planning process indicates that most of the Municipality's assets are either in good or fair condition. Over time, however, the Municipality will need to invest in order to address the ongoing deterioration and aging of its infrastructure, with the expected total requirement over the next ten years to be in the order of $16.7 million.

Details of the Municipality's infrastructure condition assessment and identified capital investment requirements over the next ten years are provided on the following page.

Replacement value by type of asset (in millions)

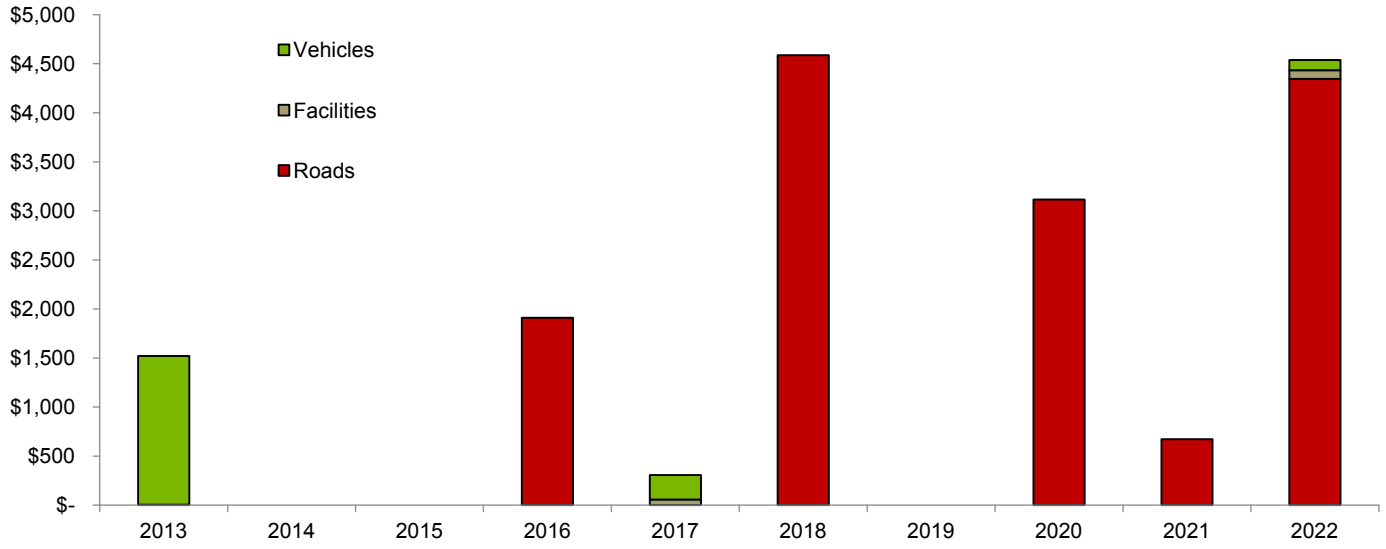


Executive Summary

Condition assessment results by infrastructure component

Infrastructure	Condition Assessment		
	Good	Fair	Poor
Roads – paved	87%	13%	–
Roads – gravel	100%	–	–
Water mains	–	100%	–
Wastewater mains	36%	64%	–
Bridges	100%	–	–
Buildings	46%	25%	29%
Vehicles	47%	5%	48%

Projected future infrastructure investment requirements (in thousands)



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Asset management strategies

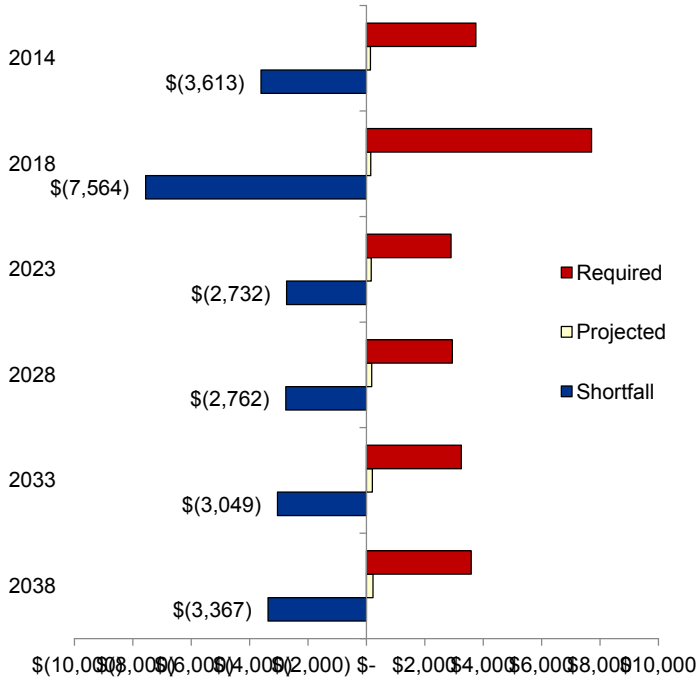
As required under MIII, this report identifies the required asset management strategies for the Municipality based on the types of infrastructure maintained as well as its current condition. As noted earlier, the Municipality would be required to spend an average of $1.6 million per year over the next ten years in order to address the current issues identified with its infrastructure. While this would allow the Municipality to meet its immediate infrastructure investment needs, it does not allow for ongoing maintenance, rehabilitation and replacement of its infrastructure, the cost of which amounts to an additional $2.2 million, bringing the Municipality's total infrastructure financing requirement to $3.8 million per year. In comparison, the Municipality generated a total of $3.6 million in revenue during 2012, which supported $1.1 million in capital expenditures (with corresponding grants of $753,000 for local funding on only $139,000) . Clearly, it is unable to address the full spectre of its infrastructure needs, resulting in ongoing annual infrastructure deficits.

In light of the significant gap between its infrastructure financing requirement and its capacity to raise revenues for capital purposes, the Municipality will be required to prioritize its investments. For the purposes of the asset management plan, three different categories have been identified:

- **Priority 1** – consists of infrastructure investments required within the next five years , investments that qualify for grants and immediate investment needs stemming from new legislation or regulation, public health or safety concerns or other issues
- **Priority 2** – includes infrastructure investments required within six to ten years and other lower priority infrastructure
- **Priority 3** – representing the lowest class of investment priority, this category includes infrastructure with no investment requirement identified within the next ten years, discontinued infrastructure and other lower priority infrastructure

For linear infrastructure, the primary driver of future capital investments will be road improvements.

Calculated annual infrastructure funding shortfalls (in thousands)



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Financing strategy

While the Municipality is unable to unilaterally address its infrastructure-related financial requirement, it recognizes the need to begin to address the challenge. As part of its financing strategy, the Municipality is proposing the following measures intended to increase funding for capital requirements:

- Permanently protecting the current level of capital expenditures so as to provide a consistent stream of funding into the future;
- Introducing a five year capital levy that would see the total levy increase by 2%, with the new revenue allocated to capital purposes (i.e. not for operations). The capital levy would add approximately $30,000 per year to existing capital funding ($157,000 in total over the next five years), representing a 112% increase in capital spending.
- Exploring the continued use of debt as a means of funding infrastructure requirements, including the adoption of a program whereby a fixed percentage of capital expenditures are financed through debt; and
- Upon the repayment of existing indebtedness, redirecting debt servicing costs to capital expenditures, capital reserves or new debt for capital projects so as to preserve existing funding for capital purposes; and
- Continuing to pursue grant programs provided by senior levels of government.

The issue of affordability

When considering the Municipality's ability to fund its capital requirements and its entitlement for grants, there needs to be a recognition of the limited ability of the Municipality to finance its capital needs due to issues surrounding affordability. In addition to the affordability considerations developed by the Province under the revised OMPF model, it is also important to remember that:

- The Municipality's population has decreased at a significantly faster rate than other communities and the Province as a whole. While the Province's total population increased by 19.5% between 1996 and 2011, the Municipality's population fell by 16.7% over the same period. The consequence of this trend is clear – fewer people in the community translates into fewer people able to fund municipal operations.
- The Municipality's residents have a higher degree of reliance on pension income (i.e. fixed income) as opposed to other communities. Overall, 20% of total reported personal income in the Municipality is derived from pensions, as opposed to the Provincial average of 14%. Additionally, the proportions of employment and pension income earned by the Municipality's residents has changed significantly over the last decade, with employment income falling from 68% of reported personal income to 60%, while pension income has increased from 14% to 20%. The consequences of this trend are also clear – those residents that remain within the Municipality are increasingly limited in their ability to afford ongoing taxation increases given the higher reliance on fixed income sources.

Executive Summary

About this plan

The Municipality's asset management plan has been developed based on the guidance provided by the Province in *Building Together – Guide for Municipal Asset Management Plans,* which has been tailored to reflect the small size of the Municipality and the nature of its operations and infrastructure. Preparation of the plan involved Municipal staff as well as external financial and engineering advisors paid for through the MIII.

In completing the asset management plan for the Municipality:

- Accepted industry best practices were used for the development of the plan components, including the condition assessments, identification of life cycle requirements and estimated costs;
- The asset management plan was reviewed by Municipal council prior to adoption;
- The asset management plan was compared to the requirements under MIII to ensure compliance; and
- Expressions of interest submitted to date have been based on the priorities identified in the asset management plan.

We would like to acknowledge the cooperation of Municipal staff in the preparation of this report.

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Asset Management Planning for the Township of Moonbeam

Chapter I
Introduction

Overview of the Asset Management Plan

Asset management planning defined

Asset management planning is the process of making the best possible decisions regarding the acquisition, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective of an asset management plan is to maximize benefits, manage risk and provide satisfactory levels of service to the public in a sustainable manner. In order to be effective, an asset management plan needs to be based on a thorough understanding of the characteristics and condition of infrastructure assets, as well as the service levels expected from them. Recognizing that funding for infrastructure acquisition and maintenance is often limited, a key element of an asset management plan is the setting of strategic priorities to optimize decision-making as to when and how to proceed with investments. The ultimate success or failure of an asset management plan is dependent on the associated financing strategy, which will identify and secure the funds necessary for asset management activities and allow the Municipality to move from planning to execution.

The purpose of the asset management plan

The asset management plan outlines the Municipality's planned approach for the acquisition and maintenance of its infrastructure, which in turn allows the Municipality to meet its stated mission and mandate by supporting the delivery of services to its residents. In achieving this objective, the asset management plan:

- Provides elected officials, Municipal staff, funding agencies, community stakeholders and residents with an indication of the Municipality's investment in infrastructure and its current condition;
- Outlines the total financial requirement associated with the management of this infrastructure investment, based on recommended asset management practices that encompass the total life cycle of the assets;
- Prioritizes the Municipality's infrastructure needs, recognizing that the scope of the financial requirement is beyond the capabilities of the Municipality and that some form of prioritization is required; and
- Presents a financial strategy that outlines how the Municipality intends to meet its infrastructure requirements.

It is important to recognize that the asset management plan is just that – a plan. The asset management plan (which has been prepared for the purposes of meeting the requirements of the Municipal Infrastructure Investment Initiative) does not represent a formal, multi-year budget for the Municipality. The approval of operating and capital budgets is undertaken as part of the Municipality's overall annual budget process. Accordingly, the financial performance and priorities outlined in the asset management plan are subject to change based on future decisions of Council with respect to operating and capital costs, taxation levels and changes to regulatory requirements or the condition of the Municipality's infrastructure.

Methodology

The development of the Municipality's asset management plan involved the following major worksteps.

Workstep	Report Section
1. Information concerning the Municipality's tangible capital assets was reviewed and summarized to provide a preliminary inventory of assets, acquisition year, remaining useful life and historical cost.	Chapter II
2. A condition assessment of the Municipality's infrastructure was developed based on a review of previously commissioned assessments, the age and estimated remaining useful life of the infrastructure and engineering inspections of certain components.	Chapter II
3. Asset management strategies for each component of the Municipality's infrastructure were developed to provide an indication as to the recommended course of action for infrastructure procurement, maintenance and replacement/rehabilitation over the estimated useful life of the infrastructure component. As part of the development of the asset management strategies, cost estimates were prepared for the recommended activities.	Chapter IV
4. Based on the asset management strategies (which provide an indication as to the cost of the recommended activities) and the condition assessment (which provides an indication as to the timing of the recommended activities), an unencumbered financial projection was developed that outlined the overall cost of recommended asset management strategies assuming that the Municipality was to undertake all of the recommended activities when required (i.e. assuming sufficient funds were available for all required infrastructure maintenance and replacement). Consistent with the provisions of MIII, no grants were considered in the preparation of the unencumbered financial projection.	Chapter V
5. Recognizing that the overall financial requirement associated with the recommended asset management strategies is unaffordable for the Municipality, the required asset management activities were prioritized based on the potential risk of failure (determined by the condition assessment), the potential impact on residents and other stakeholders and other considerations.	Chapter V
6. A second set of financial projections was developed based on the resources available to the Municipality to support its asset management activities, including funding from taxation and user fees. Consistent with the provisions of MIII, no grants were considered in the preparation of the financial projections.	Chapter V

The development of the asset management plan involved input from the following parties:

- Council and staff of the Municipality
- KPMG LLP, financial advisors to the Municipality
- exp Services Inc., engineering advisors to the Municipality

Scope of the Asset Management Plan

The asset management plan encompasses the following components of the Municipality's infrastructure:

Transportation Infrastructure	Water and Wastewater Infrastructure	Other Infrastructure
• Roads • Bridges and culverts • Streetlights • Storm sewers	• Treatment facilities • Water distribution system • Wastewater collection system	• Vehicles • Facilities

For the purposes of developing the asset management plan, a 25-year planning horizon was considered, although the analysis includes a discussion of required activities over the entire life cycle of the Municipality's infrastructure. It is expected that the Municipality will update its asset management plan every four years (to coincide with Council elections) or earlier in the event of a major change in circumstances, which could include:

- New funding programs for infrastructure
- Unforeseen failure of a significant infrastructure component
- Regulatory changes that have a significant impact on infrastructure requirements
- Changes to the Municipality's economic or demographic profile (positive or negative), which would impact on the nature and service level of its infrastructure

Evaluating and Improving the Asset Management Plan

The asset management plan outlined in this report represents a forecast of the Municipality's infrastructure-related activities under a series of assumptions that are documented within the plan. The asset management plan does not represent a formal, multi-year budget for infrastructure acquisition and maintenance activities but rather a long-term strategy intended to guide future decisions of the Municipality and its elected officials and staff, recognizing that the approval of operating and capital budgets is undertaken as part of the Municipality's overall annual budgeting process.

In order to evaluate and improve the asset management plan, the Municipality plans to undertake the following actions:

Action Item	Frequency
1. Updating of infrastructure priorities based on: • Ongoing condition assessments (e.g. bi-annual bridge inspections) • Visual inspection by municipal personnel • Identified failures or unanticipated deterioration of infrastructure components • Analysis of performance indicators	Annually
2. Adjustment of asset management plan for changes in financial resources, including new or discontinued grant programs, changes to capital component of municipal levy, etc.	Every four years
3. Comparison of actual service level indicators to planned service level indicators and identification of significant variances (positive or negative)	Annually
4. Updating of infrastructure data maintained in Municipal Data Works	Annually upon completion of the Municipality's financial statement audit

Restrictions

This report is based on information and documentation that was made available to KPMG at the date of this report. KPMG has not audited nor otherwise attempted to independently verify the information provided unless otherwise indicated. Should additional information be provided to KPMG after the issuance of this report, KPMG reserves the right (but will be under no obligation) to review this information and adjust its comments accordingly.

Pursuant to the terms of our engagement, it is understood and agreed that all decisions in connection with the implementation of advice and recommendations as provided by KPMG during the course of this engagement shall be the responsibility of, and made by, the Township of Moonbeam. KPMG has not and will not perform management functions or make management decisions for the Township of Moonbeam.

This report includes or makes reference to future oriented financial information. Readers are cautioned that since these financial projections are based on assumptions regarding future events, actual results will vary from the information presented even if the hypotheses occur, and the variations may be material.

Comments in this report are not intended, nor should they be interpreted to be, legal advice or opinion.

KPMG has no present or contemplated interest in the Township of Moonbeam nor are we an insider or associate of the Township of Moonbeam or its management team. Our fees for this engagement are not contingent upon our findings or any other event. Accordingly, we believe we are independent of the Township of Moonbeam and are acting objectively.

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Asset Management Planning
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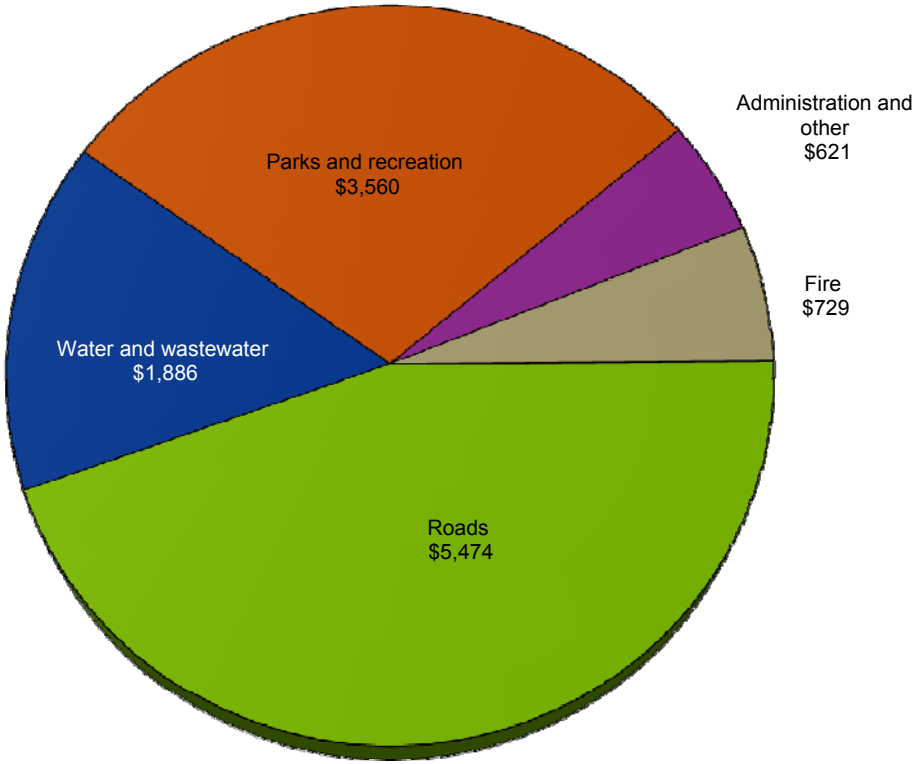
Chapter II
State of Local Infrastructure

Overview of the Municipality's Infrastructure

At December 31, 2012, the Municipality reported a total investment of $12.3 million in tangible capital assets ('TCA') at historical cost. This equates to an average investment of $15,000 per household, or $11,000 per resident.

With a historical cost of $5.5 million, the municipal road network represents the largest capital asset, accounting for 45% of the overall historical cost of the Municipality's infrastructure. Parks and recreation infrastructure ($3.6 million) and water and wastewater infrastructure ($1.9 million) represent the next largest components of the Municipality's tangible capital assets.

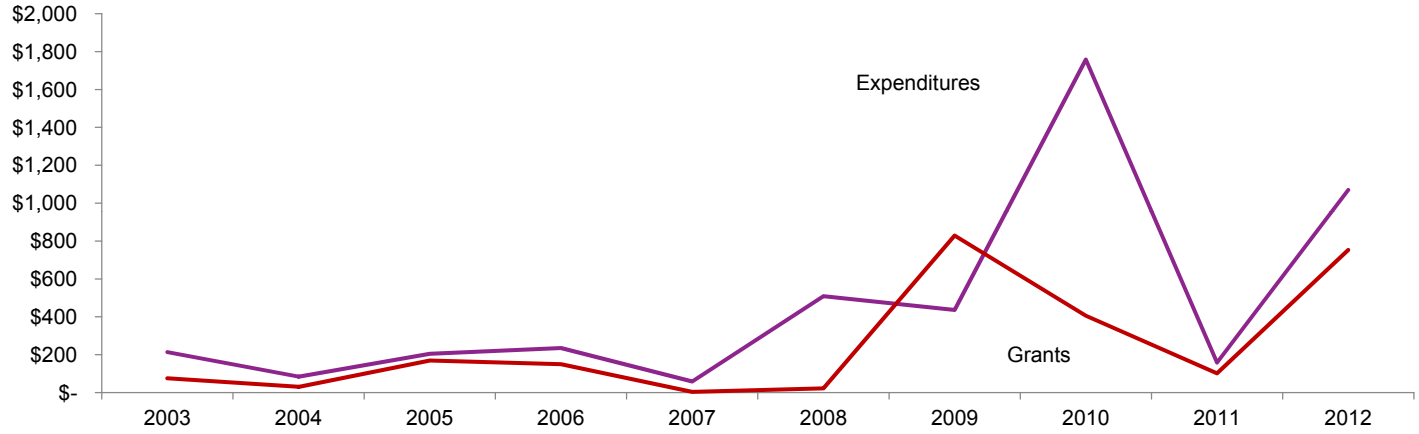
Tangible capital assets by use (historical cost, in thousands)



Overview of the Municipality's Infrastructure

Over the last 10 years, the Municipality's investment in its infrastructure has totaled $4.7 million, with Federal and Provincial capital grants amounting to approximately $2.5 million over the same period. As noted below, the Municipality's investment in infrastructure has traditionally been closely tied to grant revenues.

Capital expenditures and grants (in thousands)



Since 2003, transportation infrastructure has represented the largest area of investment for the Municipality, amounting to $2.1 million or 44% of total capital spending. Parks and recreation infrastructure represents the next largest category, amounting to $1.2 million.

Capital expenditures by program

(in thousands of dollars)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Transportation	61	7	18	135	30	458	–	1129	131	101	2,070
Environmental services	24	31	172	20	2	22	17	15	–	51	354
Parks and recreation	66	4	8	65	16	13	80	93	16	854	1,215
Fire	19	14	–	–	5	13	339	126	–	51	567
Administration and other	44	28	7	15	6	3	0	395	11	13	522
Total	214	84	205	235	59	509	436	1,758	158	1,070	4,728

Overview of the Municipality's Infrastructure

In order to fund its capital investments, the Municipality has relied on a combination of grants, long-term debt, contributions from reserves and reserve funds and taxation and user fee revenues, with grants funding 61% of capital expenditures. Over the last ten years, the Municipal has not issued any long-term debt.

Capital expenditures and funding

(in thousands of dollars)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Total	214	84	205	235	59	509	436	1,758	158	1,070	4,728
Grants received	75	30	169	150	4	22	829	406	102	753	2,540
Local financing requirement	139	54	36	85	55	487		1352	56	139	54
Long-term debt issued	–	–	–	–	–	–	–	–	–	–	–
Taxation, user fee and reserve funding	139	54	36	85	55	487		1352	56	139	54

As at December 31, 2012, the Municipality had a total of $337,000 in outstanding long-term debt, which was related to the following functions:

- Fire $98,000
- Roads $155,000
- Parks and recreation $84,000

Historical, Replacement and Life Cycle Cost

For asset management purposes, the historical cost of the Municipality's infrastructure is arguably of limited value in that it reflects the cost at the date that the infrastructure investment was incurred, as opposed to what it would cost the Municipality to replace the infrastructure at the present time. While the use of replacement value is a more meaningful measure of the financial requirement associated with the Municipality's infrastructure (and is a required component for asset management plans under MIII), it is also of limited value in that it only considers the replacement cost at the end of the infrastructure's useful life and does not contemplate:

- The fact that certain components of the Municipality's infrastructure, such as roads, will not be fully replaced at the end of useful life but rather will be reconstructed; and
- Asset management activities that are required (by best practice) to be incurred prior to the end of the useful life of the Municipality's infrastructure.

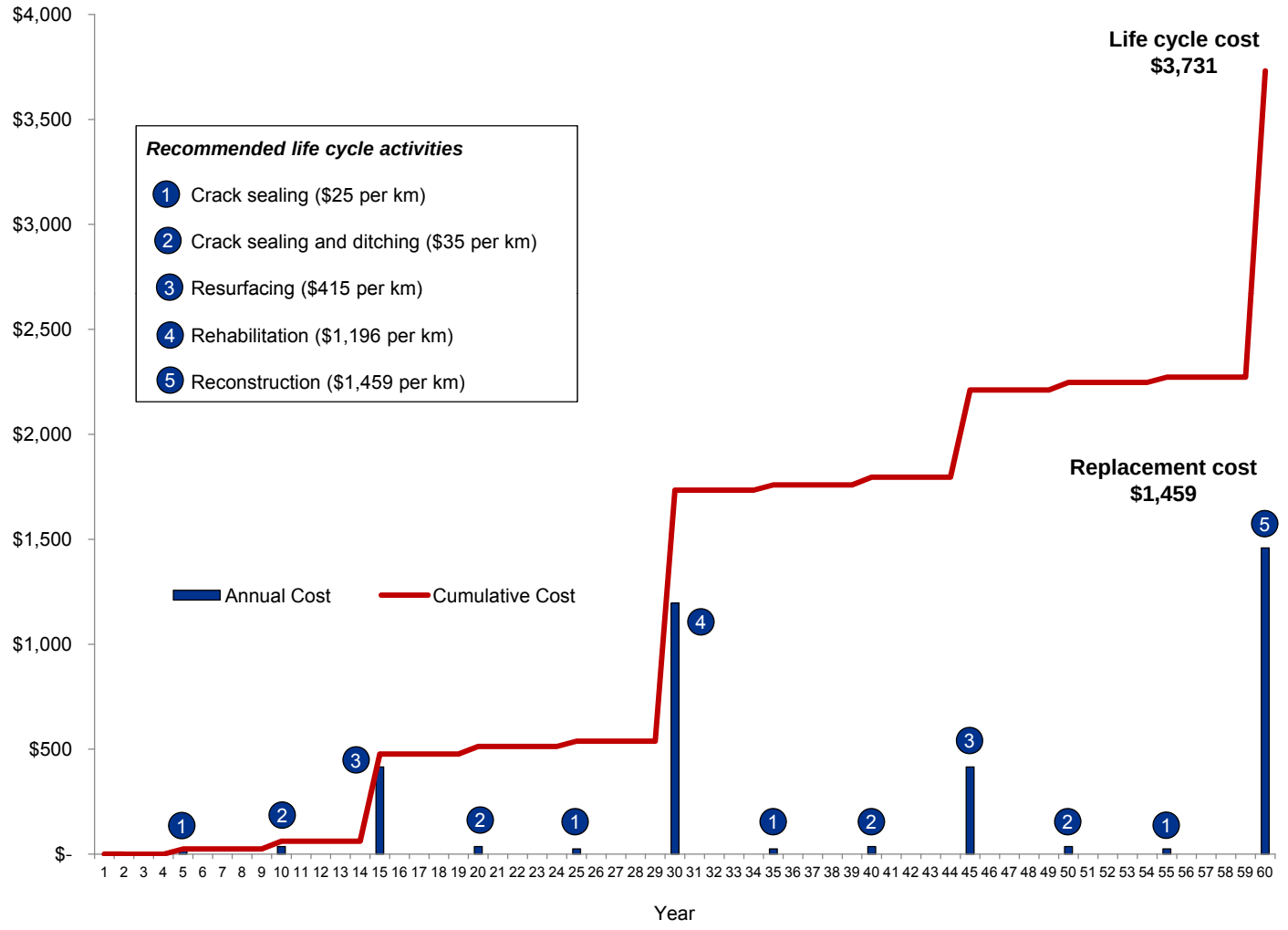
Accordingly, for the purposes of the Municipality's asset management plan, we have provided the following for each component of the Municipality's infrastructure:

- **Historical cost**, based on the Municipality's TCA data as reported in its 2012 financial information return
- **Replacement cost**, based on cost estimates prepared by the Municipality's engineering advisors. For the purposes of the asset management plan, replacement cost is defined as follows:
  - Roads – road reconstruction costs at the end of useful life, including necessary curbs, sidewalks, drainage (as appropriate based on the type of road)
  - Bridges and culverts – estimated reconstruction cost
  - Water and wastewater pipes – replacement costs at the end of useful life, including hydrants, valves, road reinstatement and service to the property line
  - Vehicles – estimated purchase price
  - Buildings – estimated reconstruction cost
- **Life cycle costs**, based on cost estimates prepared by the Municipality's engineering advisors. Life cycle costs encompass the cost of all recommended maintenance activities associated with a component of the Municipality's infrastructure prior to the end of useful life. The nature of life cycle costs will vary depending on the type of infrastructure in question, with certain assets requiring little life cycle activities prior to the end of useful life while others require regularly scheduled maintenance activities. For the purpose of the Municipality's asset management plan, life cycle costs have been provided for linear infrastructure (roads, water and wastewater mains).

  We have included on the following page a depiction of the life cycle requirements associated with different types of infrastructure, including the difference between replacement cost and life cycle cost.

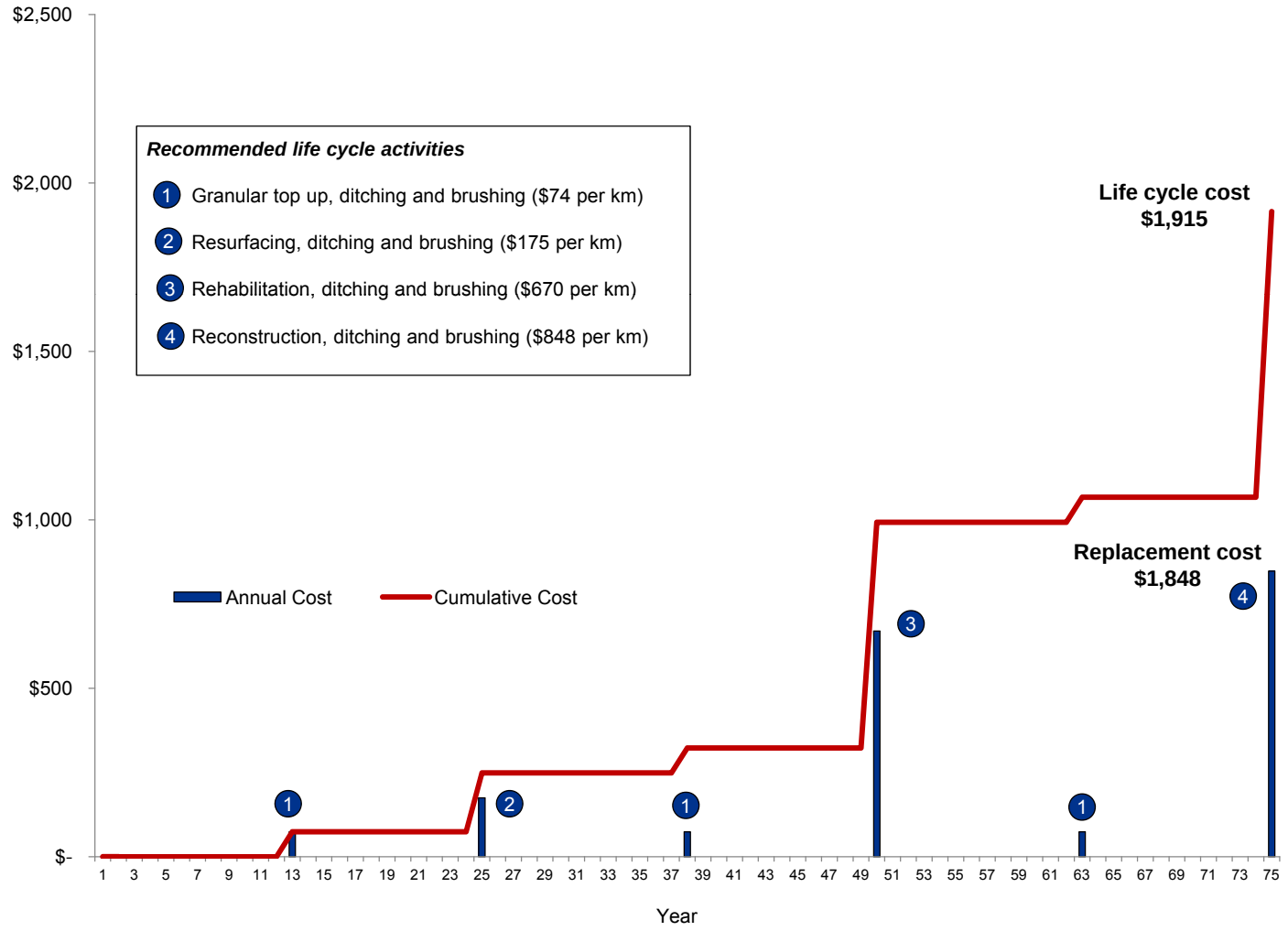
Historical, Replacement and Life Cycle Cost

Life cycle costing profile – paved rural collector road (7.0m lane) (in thousands)



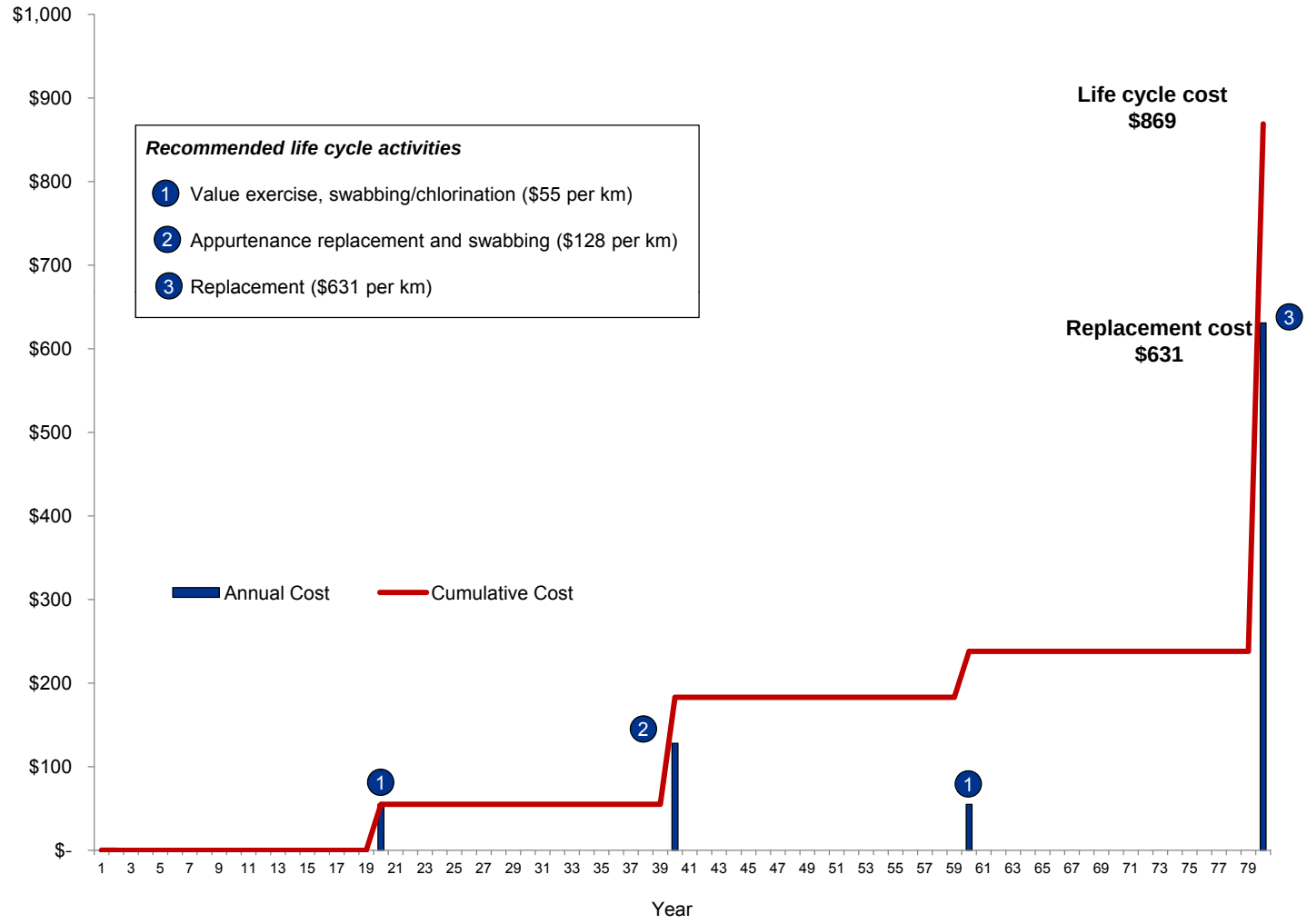
Historical, Replacement and Life Cycle Cost

Life cycle costing profile – granular rural road (6.5m lane) (in thousands)



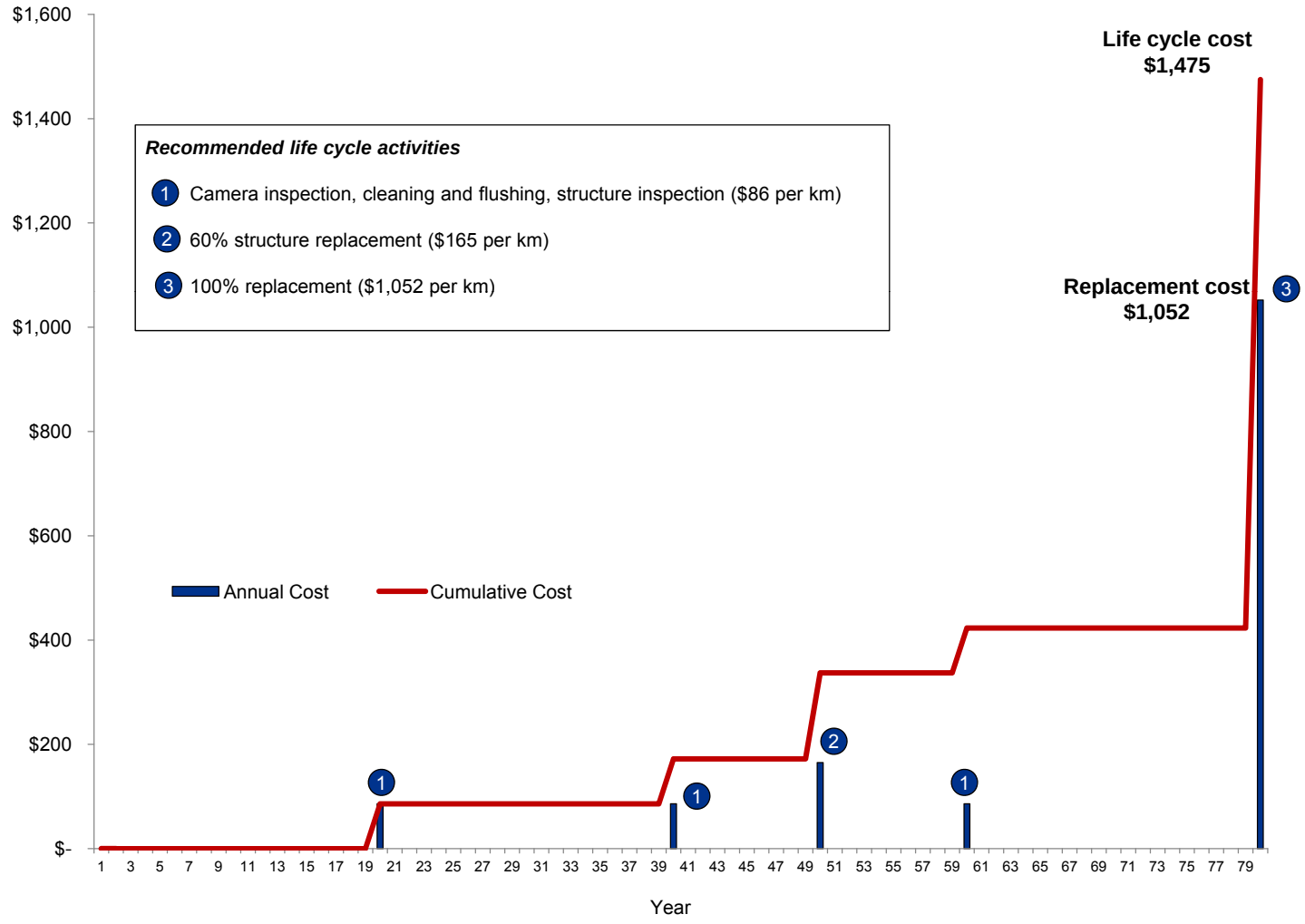
Historical, Replacement and Life Cycle Cost

Life cycle costing profile – urban water PVC distribution main (100 mm) (in thousands)



Historical, Replacement and Life Cycle Cost

Life cycle costing profile – sanitary sewer collection (150mm to 300mm) (in thousands)



Historical, Replacement and Life Cycle Cost

Additional information concerning the Municipality's infrastructure can be found in the following appendices:

- **Appendix A** – Infrastructure profile – roads
- **Appendix B** – Infrastructure profile – water
- **Appendix C** – Infrastructure profile – wastewater
- **Appendix D** – Infrastructure profile – bridges and structures
- **Appendix E** – Infrastructure profile – buildings and facilities
- **Appendix F** – Infrastructure profile – vehicles
- **Appendix G** – Life cycle profiles for linear infrastructure, including recommended activities and costs
- **Appendix H** – Costing estimates for life cycle activities for linear infrastructure

The current replacement value of the Municipality's infrastructure (expressed in 2013 funds) is estimated to be in the order of $68.2 million, more than 75% of which ($53.1 million) relates to the municipal road network. Overall, the replacement value of the Municipality's infrastructure amounts to approximately $62,000 per resident or $81,000 per household, or 6 times the historical cost of infrastructure.

The total life cycle cost associated with the Municipality's linear infrastructure (roads, water and wastewater mains) is just over $123 million, with roads representing the largest category of life cycle costs ($112 million). On average, the Municipality's life cycle costs for its linear infrastructure is $112,000 per resident or $146,000 per household.

Historical, replacement and life cycle costs by component

	Quantity	Useful Life	Replacement Cost	Life Cycle Cost
Roads – paved	5,070	60 to 75 years	$9,802,810	$24,527,306
Roads – gravel	77,930	60 to 75 years	$43,251,939	$87,873,515
Water distribution network	4,433 m	80 years	$2,974,964	$4,030,801
Wastewater collection network	4,500 m	80 years	$4,734,383	$6,636,894
Total linear infrastructure			$60,764,095	$123,068,516
Bridges and structures	1	50 years	$95,000	
Buildings and facilities	24	20 to 75 years	$4,895,384	
Vehicles and equipment	19	9 to 20 years	$2,450,000	
Total in-scope infrastructure			$68,204,479	

Condition Assessment

In order to assess the condition of the Municipality's infrastructure, which in turn determines the timing for asset management activities, different approaches were adopted depending on the type of infrastructure:

- **Roads** – condition assessments for roads (paved, surface treated and gravel) were determined based on a *Condition Rating* that ranked the Municipality's road network on a scale of 0.00 to 10.00 based on factors such as structural cracking, non-structural cracking, rutting and roughness.
- **Water and wastewater mains –** given the inability to directly observe underground infrastructure, condition assessments for water and wastewater mains were determined based on the estimated remaining useful life.
- **Bridges and large culverts** – condition assessments were based on the *Bridge Condition Index* as determined by the most recent bridge inspections conducted in accordance with the Ontario Structure Inspection Manual.
- **Facilities** – condition assessments for buildings were based on a *Facility Condition Index* that considered the level of required repairs to the various facility components (structure, mechanical, electrical and roof) as a percentage of its total replacement cost, based on a physical inspection of the Municipality's buildings and the estimated remaining useful life.
- **Vehicles** – condition assessments for the Municipality's fleet were determined based on the estimated remaining useful life of the individual vehicles.

In order to determine the allocation of the Municipality's infrastructure by condition category (good, fair, poor), the following benchmarks were utilized.

Condition assessment benchmarks

Infrastructure components	Basis of Assessment	Good	Fair	Poor
Roads	Condition rating	Greater than 6.00	4.00 to 6.00	Less than 4.00
Water and wastewater mains	Remaining useful life	Greater than 50%	10% to 50%	Less than 10%
Bridges and large culverts	Bridge condition index	Greater than 70	60 to 70	Less than 60
Facilities	Facility condition index	Less than 5%	5% to 10%	More than 10%
Vehicles	Remaining useful life	Greater than 50%	10% to 50%	Less than 10%

Condition Assessment

Details of the condition assessments for individual infrastructure components can be found in the infrastructure profiles in **Appendices A to F.**

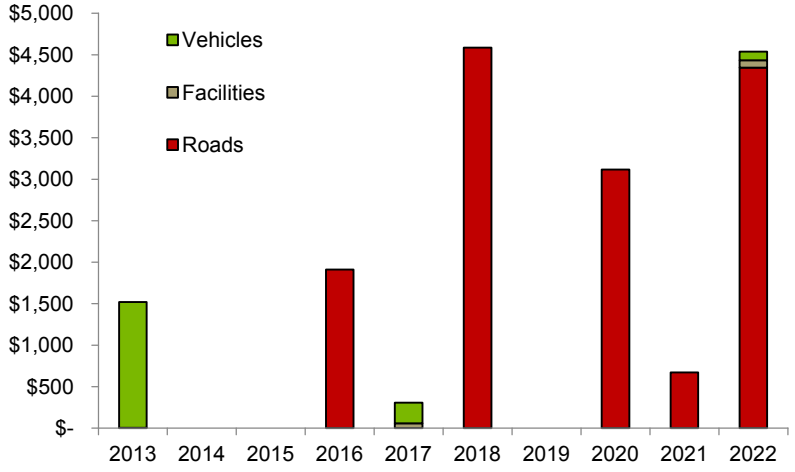
The results of the condition assessment indicate that the Municipality's infrastructure is in generally good shape, with the majority of its assets classified as either good or fair condition.

Condition assessment results by infrastructure component

Infrastructure	Condition Assessment		
	Good	Fair	Poor
Roads – paved	87%	13%	–
Roads – gravel	100%	–	–
Water mains	–	100%	–
Wastewater mains	36%	64%	–
Bridges	100%	–	–
Buildings	46%	25%	29%
Vehicles	47%	5%	48%

With the exception of fleet, there are no pressing infrastructure priorities to be addressed by the Municipality, which reflects the overall good to fair condition of its infrastructure. Over the next ten years, however, the Municipality is expected to require a total of $16.7 million in infrastructure investments, the majority of which ($14.6 million) relates to its road network. The requirement for future investments in the roads reflects both the ongoing deterioration and sheer size of the network.

Projected future infrastructure investment requirements (in thousands)



Data Verification and Condition Assessment Policies

On a go-forward basis, the following policies will govern the updating and verification of the condition assessment:

- Condition assessments for bridges will be conducted every two years in accordance with Provincial regulations, with the asset management plan updated accordingly
- Condition assessments for water and wastewater mains will be assessed periodically through the use of camera inspections, with a five year inspection cycle being the long-term target
- Condition assessments for facilities will be assess through an engineering/architectural inspection of the facilities periodically, with a ten year inspection cycle being the long-term target
- Condition assessments for other assets will be based on the percentage of remaining useful life in the absence of a third-party assessment of the assets. On an annual basis, the Town will review the useful lives and condition assessment criteria (good, fair, poor based on percentage of remaining life) and will adjust the asset management plan accordingly

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Chapter III
Desired Levels of Service

Performance Measures

The Municipality's asset management strategy is intended to maintain its infrastructure at a certain capacity and in doing so, allow it to meet its overall objectives with respect to service levels for its residents. Highlighted below are the key performance measures and service level targets for the major components of the Municipality's infrastructure, as well as an assessment of its current performance and the anticipated date for achieving the service level target.

Infrastructure Component	Performance Measure	Targeted Performance	Achievement Date
Roads	Compliance with Ontario Regulation 239/02 – Minimum Maintenance Standards for Municipal Highways	Full compliance	2014
Water	Days under boil water advisory	None	2014
	Response time for notices submitted in accordance with subsection 18(1) of SDWA	5 days	2014
	Number of water main breaks per 100 km	5.0	2017
Wastewater	Wastewater backups per 100 km	20.0	2017
	Percentage of wastewater flows bypassed	5.0%	2017
Vehicles	Operability	90%	2014
Facilities	Availability (percentage of planned operating hours)	99%	2014
	Compliance with Accessibility for Ontarians with Disability Act and Integrated Accessibility Standards	Full compliance	As per legislation

It is anticipated that the Municipality will monitor and report on its performance annually.

It is also important to recognize that in certain instances, a deviation from the Municipality's targeted service level may be the result of uncontrollable and unforeseen factors and any evaluation of the Municipality's performance should differentiate between controllable and uncontrollable events. For example, the availability of facilities (as a percentage of planned operating hours) could be impacted by weather conditions or power disruptions that may result in the closure of facilities but which are not caused by the Municipality or otherwise controllable. Absent some form of compensating strategy (such as standby power generators), these events may cause the Municipality to deviate from its targeted service levels.

The Impact of New Legislation and Regulation

From time to time, new legislation or regulations will be enacted that change minimum performance requirements for municipal infrastructure and by extension the performance measures outlined in the Municipality's asset management plan. At the present time, three major items of legislation and regulation have been identified as having the potential to impact on the Municipality's desired service levels and asset management plan:

- The *Accessibility for Ontarians with Disability Act* and the accompanying *Integration Accessibility Standards* may require the Municipality to alter components of its infrastructure to ensure accessibility for individuals with disabilities. The timeframe for compliance with the Act depends on both the nature of the requirement and the size of the municipality, with smaller communities generally provided with an extended period for compliance as compared to the Province or larger municipalities.
- The Province of Ontario has recently enacted revisions to *Ontario Regulation 239/02 – Minimum Maintenance Standards for Municipal Highways*. While the majority of these changes deal with winter maintenance activities (which are not included in the scope of the asset management plan), revisions have been made to inspection requirements for certain components of a municipal road network, which will impact on the Municipality's asset management activities in the future.
- It is anticipated that the Province of Ontario will introduce new legislation relating to wastewater treatment activities that are expected to increase the minimum performance standards, which may in turn require the Municipality to amend its existing performance measurement targets and/or introduce new targets.

On an annual basis, the Municipality will evaluate the impact of enacted legislation or regulation on its desired levels of service and will adjust its performance measures accordingly.

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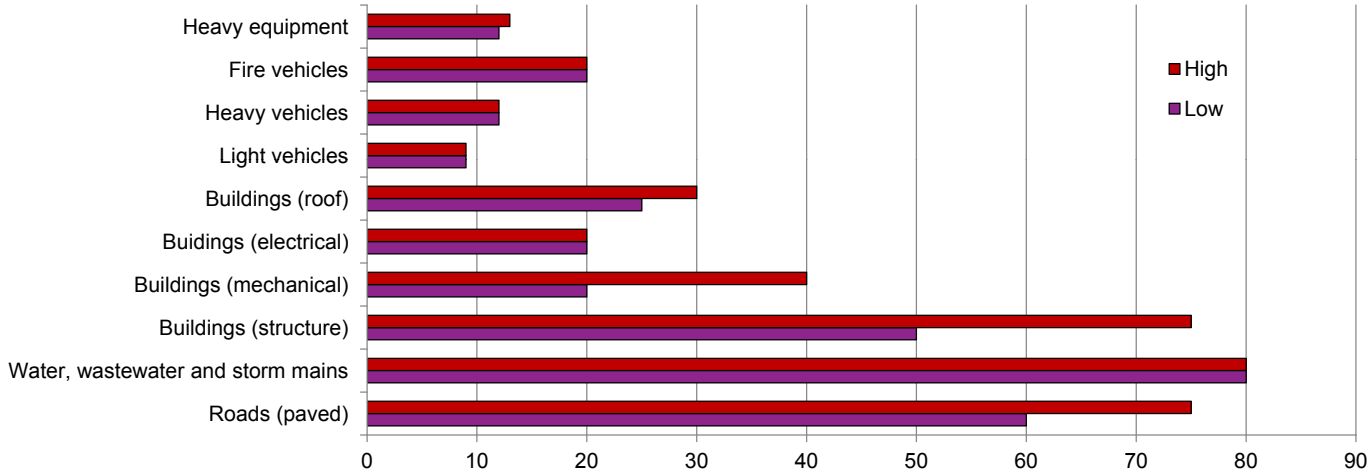
Chapter IV
Asset Management Strategy

Overview

For each significant component of the Municipality's infrastructure, asset management strategies have been developed that outline:

1. The expected life cycle period for each asset, which defines the period that the Municipality will be required to maintain its infrastructure and secure the necessary financing for maintenance and replacement activities. As noted below, there is considerable variability in the estimated life cycle periods of the Municipality's infrastructure.

Life cycles for municipal infrastructure (in years)



2. The extent to which asset management activities can be integrated with other assets, most commonly the integration of above ground and below ground infrastructure (roads, water, wastewater and storm sewer). The integration of different infrastructure components is a critical element of the Municipality's asset management plan given the staggering of the end of useful life for major assets.
3. Criteria and strategies for the replacement and rehabilitation of the assets.
4. Consequences of not undertaking the necessary asset management activities, particularly the impact on useful lives and overall costs.
5. The determination of priorities when considering integrated assets (e.g. roads and pipes).

Asset management strategies for each component are presented on the following pages.

Municipal Paved Road Systems

Anticipated asset life cycle	The life cycle of newly constructed pavement systems are dependent on several factors including the pavement design, material and construction quality, traffic volume, traffic loading, and environmental conditions. The service life can be approximated by the category of road: 60 years for pavement with curb, 60 years for pavement with open ditch, and 10 years for surface treatments.
Integration opportunities	Various other elements may be considered as integrated with paved roads. These include buried assets in the corridor: water sewers, storm sewers, hydro, telephone, natural gas, and cable. Other possible affected elements include traffic signals, street lighting, and sidewalks.
Rehabilitation and replacement criteria	To assess paved roads the Pavement Condition Index (PCI) is used. PCI is a numerical index between 0 and 10 and is based on a visual survey conducted, where 10 represents a new pavement in excellent condition and 0 an impassible pavement. If the PCI ranks at 5, resurfacing should be considered, if PCI ranges from 3 to 5, rehabilitation should be considered. In the case that the PCI falls below 3, reconstruction is a more effective option.
Rehabilitation and replacement strategies	Several different rehabilitation strategies can be implemented. The selection of the strategy is dependent on the following criteria: PCI index, road classification (arterial, collector, local), urban or rural, ditched or curbed, benefit/cost ratio. These strategies include: • Total reconstruction of pavement with 80mm to 120mm of hot mix asphalt (HMA) • Mill and resurface pavement with 50mm to 75mm of HMA • Strip and resurface pavement with 50mm to 75mm of HMA • Pulverize with underlying granular and surface with 50mm to 75mm of HMA • Mill and resurface patches of pavement with 50mm of HMA • Routing and crack sealing pavements
Life cycle consequences	Failure to fund timely pavement rehabilitation will result in a reduction in the pavement PCI. Pavement PCI's below 5 result in exponential increases in pavement rehabilitation costs. It also increases significantly road maintenance costs. Pavements identified by a PCI below 3 typically reflect decreases in level of service and increasing associated degrees of risk and liability.
Integrated asset priorities	The schedule of pavement rehabilitation is often planned in conjunction with underground utility rehabilitation works. Most commonly it is the rehabilitation of pavement systems that prompts the replacement of underground sewer and water services in the infrastructure is also in deteriorating condition and approaching its useful service life. The incorporation of other infrastructure rehabilitation may be done alongside Engineering & Public Works Department internally or with natural gas, hydro, and telephone utilities externally.

Municipal Granular Road Systems

Anticipated asset life cycle	The life cycle of newly placed gravel road systems are dependent on several factors including the material and construction quality, design, traffic volume, traffic loading, and environmental conditions. The service life can be approximated by the category of road: 60 years for earth with open ditch and 75 years for gravel with open ditch. Sufficient maintenance provided during the service life will help preserve conditions using such strategies as machine grading, ditching and brushing, and granular top up.
Integration opportunities	Various other elements may be considered as integrated with gravel roads. These include buried assets in the utility corridor: water sewers, storm sewers, hydro, telephone, natural gas, and cable.
Rehabilitation and replacement criteria	To assess gravel roads the Gravel Condition Index (GCI) is used. GCI is a numerical index between 0 and 100 and is based on a visual survey conducted, where 100 represents a newly constructed road in excellent condition and 0 an impassible roadway. If the GCI ranges from 3 to 5, rehabilitation should be considered. In the case that the GCI falls below 3, reconstruction is a more effective option.
Rehabilitation and replacement strategies	Several different rehabilitation strategies can be implemented. The selection of the strategy is dependent on the following criteria: GCI index, road classification (collector, local), urban or rural, benefit/cost ratio. In a rehabilitation scenario, the top 50 to 100 mm of gravel type “A” would be replaced. In the case of total reconstruction the work would include the replacement of the granular road base and the granular surface.
Life cycle consequences	The effects of gravel road rehabilitation that is insufficiently funded are reflected in the GCI index which as a result will typically fall below 6. The poor quality of the roadway will be reflected in rising reconstruction and maintenance costs. Roads which are identified by a GCI of 3 or lower typically show signs of a poor level of service increasing the associated degrees of risk and liability.
Integrated asset priorities	The schedule of road rehabilitation is often planned in conjunction with underground utility rehabilitation works. Most commonly it is the rehabilitation of gravel roads that prompts the replacement of underground utilities and sewer and water services if those services are deteriorating and approaching their useful service life.

Water Distribution Systems

Anticipated asset life cycle	The life cycle ranges from 30 to 100 years. Examining individual elements, the expected service life of a water plant or pump station varies from 30 to 50 years. Valve replacement typically occurs every 30 to 50 years. Similarly, the hydrant life cycle is predicted as 40 years and chambers as 50 years. For watermains the life cycle can be approximated between 50 and 100 years and 75 years for water storage. These values hold true under the assumption that the elements are properly maintained throughout their service lives.
Integration opportunities	The replacement of these components may either be implemented as part of other construction work or may be conducted as a standalone project. The replacement may be incorporated into resurfacing and road reconstruction work which could include the integration of other utilities (wastewater, telephone, hydro, cable, natural gas, etc). In the case that full road replacement is not intended, standalone replacement of watermains can be carried out using trench cut and repair.
Rehabilitation and replacement criteria	Several criteria used to evaluate and prioritize the watermain replacement schedules include: age, break history of the pipe, material type, size, surrounding soil conditions, pressure related issues, and hydrant spacing. In addition to these criteria other factors, such as the intent of future road rehabilitation, will modify the priority of the replacement schedule accordingly. Available historical data, which includes but is not limited to pipe failures and pipe break history, is used to aid in the replacement criteria. When a continued increase in maintenance costs reaches an uneconomical value, the replacement of the pipe is justified.
Rehabilitation and replacement strategies	The rehabilitation strategy is dependent on the current state of the pipe. It is difficult to assess the state of deterioration in buried services, as such, high pressure cleaning and videotaping of watermains may be instituted. Several different rehabilitation approaches can be taken and include full replacement, cleaning and relining, and potential pipe bursting. Cathodic protection, when used in conjunction with these strategies, prolongs the service life. The strategy is chosen based primarily on the available data including the age, size, material type, break history, and hydraulic requirements.
Life cycle consequences	The repercussions of unexpected failure will be disastrous. Due to unaccounted circumstances and unpredictable events, it is possible that some pipe materials with an expect service life of 100 years will require replacement earlier than expected, after only 30 years. In contrast, pipe materials with an expected life of 100 years may have the service life extended by an additional 50 years, with timely maintenance and rehabilitation.
Integrated asset priorities	Replacement of deteriorating watermains is carried out based on the associated level of risk. The sequence in which rehabilitation or replacement is carried out is reliant on the priority of the watermain and the impact of disruption to service. High priority watermains include those where fire protection, water quality, and service disruption will results in water loss and collateral damage. Typically the integration of road rehabilitation with watermain replacement will increase the priority of the project. The project may also incorporate utilities such as wastewater, hydro, telephone, cable and gas.

Wastewater Collection Systems

Anticipated asset life cycle	The life cycle ranges from 15 to 100 years. Wastewater plants and sewage pump stations vary from 30 to 50 years. Examining individual elements, the expected service life of wastewater plant equipment, pumps, blowers, and SCADA systems ranges from 15 to 50 years. A manhole life cycle is predicted to be between 30 to 75 years and wastewater trunks between 50 to 100 years. These values hold true under the assumption that the elements are properly maintained throughout their service lives.
Integration opportunities	The replacement of these components may either be implemented as part of other construction work or may be conducted as a standalone project. The replacement may be incorporated into resurfacing and road reconstruction work which could include the integration of other utilities (wastewater, telephone, hydro, cable, natural gas, etc). In the case that full road replacement is not intended, standalone replacement of sanitary trunk can be carried out using trench cut and repair.
Rehabilitation and replacement criteria	The assessment of the replacement schedule is determined primarily through conducting a CCTV inspection. The results of the inspection will be evaluated to estimate the degree of deterioration of the infrastructure. Included in the assessment are other criteria such as the material type, visible local collapses, upsizing requirements, and synchronization with roads rehabilitation programs.
Rehabilitation and replacement strategies	The rehabilitation strategy is dependent on the assessed condition rating of the infrastructure. The optimal rehabilitation method is determined by assigning and examining the condition rating of the pipe. Most commonly the selected strategy is replacement of collapsing and deteriorated pipe. For localized damage, other practices may be instituted which include: spot repair, joint sealing, and Cured in Place Pipe (CIPP).
Life cycle consequences	The process of degradation in sanitary sewers is similar to that of storm sewers. The repercussions of failure in sanitary sewers are considerably more substantial. Structural deterioration may lead to infiltration of ground water into the system which results in an increased volume of sewage directed to waste water treatment plants. These plants may not be designed to meet the growing demand result in increase in waste water flow. Infiltration of ground water can also result in the deposition of sediment and debris, significantly reducing the flow capacity for waste water. Continued maintenance and rehabilitation is essential for the performance and reliability of any type of buried infrastructure.
Integrated asset priorities	Replacement of deteriorating sanitary sewers is carried out based on the assessed condition. In the event that replacement is selected as the rehabilitation strategy, the project may expand to include other assets such as sidewalks, road trench cuts, or full pavement. Other utilities may also become included in the scope of work: hydro, telephone, cable, and natural gas. Typically the integration of road rehabilitation will increase the priority of the project.

Storm Water Collection Systems

Anticipated asset life cycle	A manhole life cycle is predicted to be between 30 to 75 years and stormwater trunks to be 50 to 100 years. These values hold true under the assumption that the elements are properly maintained throughout their service lives. A longterm maintenance plan is also necessary for SWM ponds and treatment structures as part of ongoing operational finances, in order to extend the structure replacement to between 30 to 75 years.
Integration opportunities	The replacement may be incorporated into resurfacing and road reconstruction work which could include the integration of other utilities (wastewater, telephone, hydro, cable, natural gas, etc). In the case that full road replacement is not intended, standalone replacement of sanitary trunk can be carried out using trench cut and repair.
Rehabilitation and replacement criteria	The development of the replacement schedule is determined primarily through conducting a CCTV inspection. The results of the inspection will be evaluated to estimate the degree of deterioration of the infrastructure. Included in the assessment are other criteria such as the material type, visible local collapses, upsizing requirements, and synchronization with roads rehabilitation programs. This investigation should be carried out every 20 years, rotating through the storm sewer systems, or when required, to examine system problems/failures. Additional stresses have been imposed on storm sewer systems with climate change and the increasing frequency and intensity of storms. Storm sewer systems are also strained and forced to expand with new land development.
Rehabilitation and replacement strategies	The rehabilitation strategy is dependent on the assessed condition rating of the infrastructure. The optimal rehabilitation method is determined upon assigning and examining the condition rating of the pipe. Most commonly the selected strategy is replacement of collapsing and deteriorated pipe.
Life cycle consequences	The process of degradation in storm sewers is similar to that of sanitary sewers however the repercussions of failure in storm sewers are considerably less substantial. Structural deterioration may lead to infiltration of ground water resulting in the deposition of sediment and debris, significantly reducing the flow of water. Continued maintenance and rehabilitation is essential for the durability of any type of buried infrastructure.
Integrated asset priorities	Replacement of deteriorating storm sewers is carried out based on the assessed condition. In the event that replacement is selected as the rehabilitation strategy, the project may expand to include other assets such as sidewalks, curb/gutter, road trench cuts, or full pavement. Other utilities may also become included in the scope of work: hydro, telephone, cable, and natural gas. Typically the integration of road rehabilitation will increase the priority of the project.

Bridges and Large Culverts

Anticipated asset life cycle	The life cycle of bridges and culverts is considerably variable and dependent on construction methodology and materials, traffic loading, traffic volume, and environmental exposure conditions (temperatures, chloride concentrations, etc). Bridges and concrete culverts constructed after 2000 have an expected life cycle of 75 years, whereas those constructed pre 2000 have an expected life of 50 years. The approximated service life of steel corrugated culverts is 40 years.
Integration opportunities	Typically it is not integrated with the other work other than potential road widening or resurfacing projects.
Rehabilitation and replacement criteria	The ranking of bridge and culvert work is based on several select criteria: safety, level of service, traffic volume and loading, and preservation of infrastructure. To assess the condition of the structures bi-annual visual inspections are conducted and if deemed necessary detailed bridge condition surveys are completed to better evaluate present conditions. In the inspections, bridge components are assessed individually recording the severity and degree of deterioration and the overall condition. Each bridge is assigned a Bridge Condition Index value between 100 and 0 where a value of 100 indicates excellent conditions and a value of 0 indicates poor deteriorating conditions.
Rehabilitation and replacement strategies	The specification of the bridge or culvert rehabilitation strategy is reliant on the structure's age, data and observations acquired through inspections and condition surveys, and the estimated remaining service life. The following strategies should be implemented at the specified age: at 15 years the asphalt deck should be resurfaced and at 30 years the concrete deck should be patched, waterproofed and the joints replaced; at 50 years replace entire concrete deck.
Life cycle consequences	The reduction of bridge and culvert service life endangers user safety and results in a decrease of level of service.
Integrated asset priorities	Typically it is not integrated with the other work other than potential road widening or resurfacing projects.

Buildings

Anticipated asset life cycle.	The Life Cycle ranges from 15 to 50 years. Examining individual elements, the expected service life of the roof system varies from 25 to 30 years. Hot boiler or carpeting replacement typically occurs every 15 years. Similarly, the building superstructure life cycle is predicted as 50 or more years. These values hold true under the assumption that the elements are properly maintained throughout their service lives.
Integration opportunities	Assets are appraised separately. The projects however are assembled by asset to make use of the "economics of scale" principle. Special attention is given to ensure that the disruption of asset operations is minimized over its service life.
Rehabilitation and replacement criteria	To assess facilities the Facility Condition Index (FCI) is used. FCI is a ratio of total deferred maintenance, costs/ current replacement value of the facility. The index can be used to assess either individual assets or grouped assets. The FCI is currently accepted throughout North America.
Rehabilitation and replacement strategies	The replacement schedule will be dictated by the actual asset conditions at the time, the stage in its life cycle, and the FCI asset condition summaries. Replacement may also be undertaken to meet any changes in safety, industry or technological specifications and standards. The facility must also be maintained to meet the requirements of the Accessibility for Ontarians with Disabilities Act (AODA) and upgrade ingress/egress points as necessary. Critical components which should be given special attention with annual inspections include facility roof and HVAC systems. Any scheduled improvements should take into consideration the institution of economical energy efficient systems and equipment.
Life cycle consequences	Degradation of the building and its components are noticed, as well as increases in operational costs due to inefficiencies, health and safety concerns, and depreciation of Administration assets.
Integrated asset priorities	The schedule of replacement is dependent on the facility's stage in its life cycle, the actual condition at the time, and the convenience of performing the replacement without disturbing the operations.

Vehicles and Moveable Equipment

Anticipated asset life cycle.	Service life is dependent on the type or vehicle/equipment and service area. The expected life cycle of cars and pickup trucks is 8-10 years, 10 years for duty trucks, 12 years for ice resurfaces, 10-15 years for front loaders, backhoes and tractors, 20 years for graders, and 20-25 years for fire vehicles.
Integration opportunities	Integrated with operation adjustments, modifications in service levels, meeting environmental regulations, technological upgrades and financial plans.
Rehabilitation and replacement criteria	Replacement of fleet will be dictated by the results of lifecycle cost analysis considering the following variables: repairs, insurance, fuel, depreciation, and downtime costs.
Rehabilitation and replacement strategies	In the case that vehicular repairs exceed 40% of replacement costs, replacement is the optimal strategy. Other strategies include leasing opportunities, refurbishing, seasonal rentals, or tendering services to a third party.
Life cycle consequences	Vehicles that are not maintained, or as vehicles reach the end of the service lives the efficiency of vehicles decrease, seeing an increase in cost per km. In the event of service interruption, work force costs are increased due to extended work schedules and overall loss of production.
Integrated asset priorities	Not applicable.

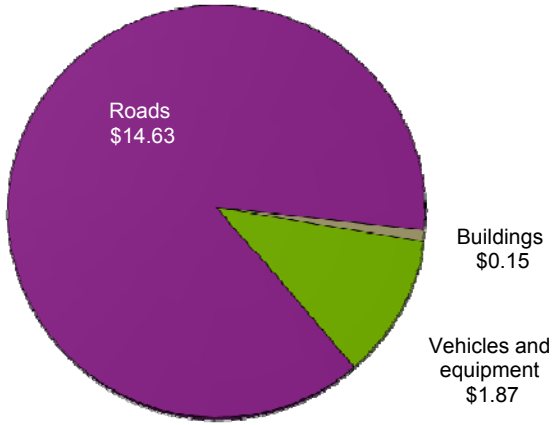
Financial Requirements

For asset management planning purposes, the financial requirement associated with the Municipality's infrastructure requirements can be divided into two categories:

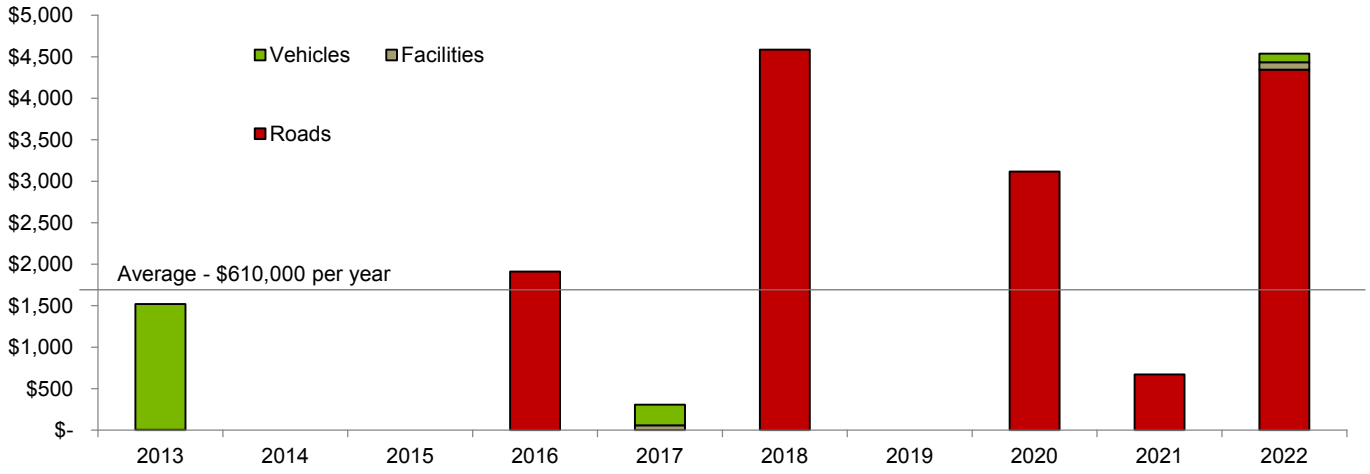
- **Immediate infrastructure investment needs.** Based on the results of the condition assessment, an indication as to the types of asset management activities required over the next ten years, and their associated costs, has been developed. Overall, it is estimated that the Municipality would need to invest $16.7 million in its infrastructure, the majority of which ($14.6 or 87%) relates to its road network.

  On average, the Municipality's immediate infrastructure investment needs amount to approximately $1.6 million per year, recognizing that major capital investments (excluding fleet) are not required until 2016.

Immediate infrastructure needs (in millions)



Projected future infrastructure investment requirements by year (in millions)



Financial Requirements

- **Sustainable life cycle requirements.** In addition to its immediate needs, the Municipality will also be required to fund the cost associated with all of its life cycle activities over the useful life of its infrastructure. As the Municipality has traditionally relied on grants to fund a major portion of its infrastructure, its historical levels of capital investment have fluctuated significantly. However, if the Municipality chose to fund its life cycle requirements evenly over the life of its assets, it would establish a regular and sustainable stream of funding for ongoing capital asset management that would be equal to either:
  - The total life cycle cost of the asset divided by its useful life. This approach is appropriate for linear assets that have significant life cycle requirements throughout their useful life.
  - The total replacement cost of the asset divided by its useful life, which is appropriate for assets with fewer life cycle requirements and where straight replacement of the asset is the more likely scenario.

  Based on this approach, we have calculated the average annual contribution required to ensure a sustainable stream of funding for the Municipality's assets to be in the order of $2.2 million.

Estimated sustainable life cycle requirement

Asset Component	Basis of Determination	Total Costs Over Useful Life	Estimated Useful Life	Annual Requirement
Roads	Life cycle	$112,400,821	60 years	$1,873,347
Water distribution network	Life cycle	$4,030,801	75 years	$53,744
Wastewater collection network	Life cycle	$6,636,894	80 years	$82,961
Bridges and culverts	Replacement	$95,000	60 years	$1,583
Buildings and facilities	Replacement	$4,895,384	50 years	$97,908
Vehicles and equipment	Replacement	$2,450,000	20 years	$122,500
Total		$130,508,900		$2,232,043

Prioritizing Infrastructure Requirements

The overall infrastructure financing requirement for the Municipality, assuming that all life cycle activities are undertaken at the recommended intervals and that the Municipality funds overall life cycle and replacement costs evenly over the assets lives, is calculated to be in the order of $3.8 million, as follows:

- Immediate infrastructure investment needs $1.6 million
- Sustainable life cycle requirements $2.2 million

In comparison, the Municipality spent $139,000 in capital expenditures during 2012 (excluding capital funding through grant funding). Given the magnitude of the estimated infrastructure financing requirement, it is evident that ***the Municipality is unable to fully meet its ongoing infrastructure requirements without significant levels of support from senior levels of government*** on an ongoing (i.e. annual) basis. As such, the Municipality will be required to prioritize its capital investments and the application of its available funds.

For asset management purposes, the investment requirements associated with the Municipality's infrastructure are divided into three main categories, as follows:

Category	Description
Priority 1	• Assets with an investment requirement within the next five years, based on condition or useful life • Co-located assets that may not require investment within the next five years but should be replaced as part of the integrated project. For example, sewer and water pipes underneath a road may not be at the end of their useful life but could be replaced as part of a road reconstruction project if they are approaching the end of their useful life before the next road reconstruction. • Assets that may qualify for specific grants, even if an immediate investment requirement has not been identified within the next five years • Infrastructure investments required as a result of changing legislation, public health or safety concerns or strategic purposes (e.g. economic development)
Priority 2	• Assets with an investment requirement within the next six to ten years • Assets that would otherwise be classed as Priority 1 but are considered to have reduced importance due to low utilization by the community (e.g. roads with low traffic volumes), compensating strategies in the event of failure (e.g. detours, reduced speed limits or load limits or limited impacts on public health or safety in the event of a failure
Priority 3	• Assets with no investment requirements identified within the next ten years • Assets to be discontinued or abandoned • Assets that would otherwise be classified as Priority 1 or 2 but are considered to have reduced importance

As part of its ongoing asset management activities, the Municipality will review its prioritization criteria and asset rankings and, if considered necessary, make appropriate revisions.

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Chapter V
Financing Strategy

Basis of Analysis

The development of the Municipality's financing strategy for its asset management plan reflects the guidance outlined by the Province of Ontario in *Building Together – Guide for Municipal Asset Management Plans*. Specifically, the development of the financing strategy (and in particular the extent of the Municipality's financing shortfall) is based on the following parameters:

- Presents annual revenues and expenditures for the planning period (25 years), as well as comparative information;
- Does not consider grants from senior governments to be a confirmed source of revenue unless an agreement has been executed. Accordingly, only Federal Gas Tax and the Municipality's allocation for capacity funding under the Municipal Infrastructure Investment Initiative have been included in the projections; and
- Identifies the potential funding shortfall and how it will be managed.

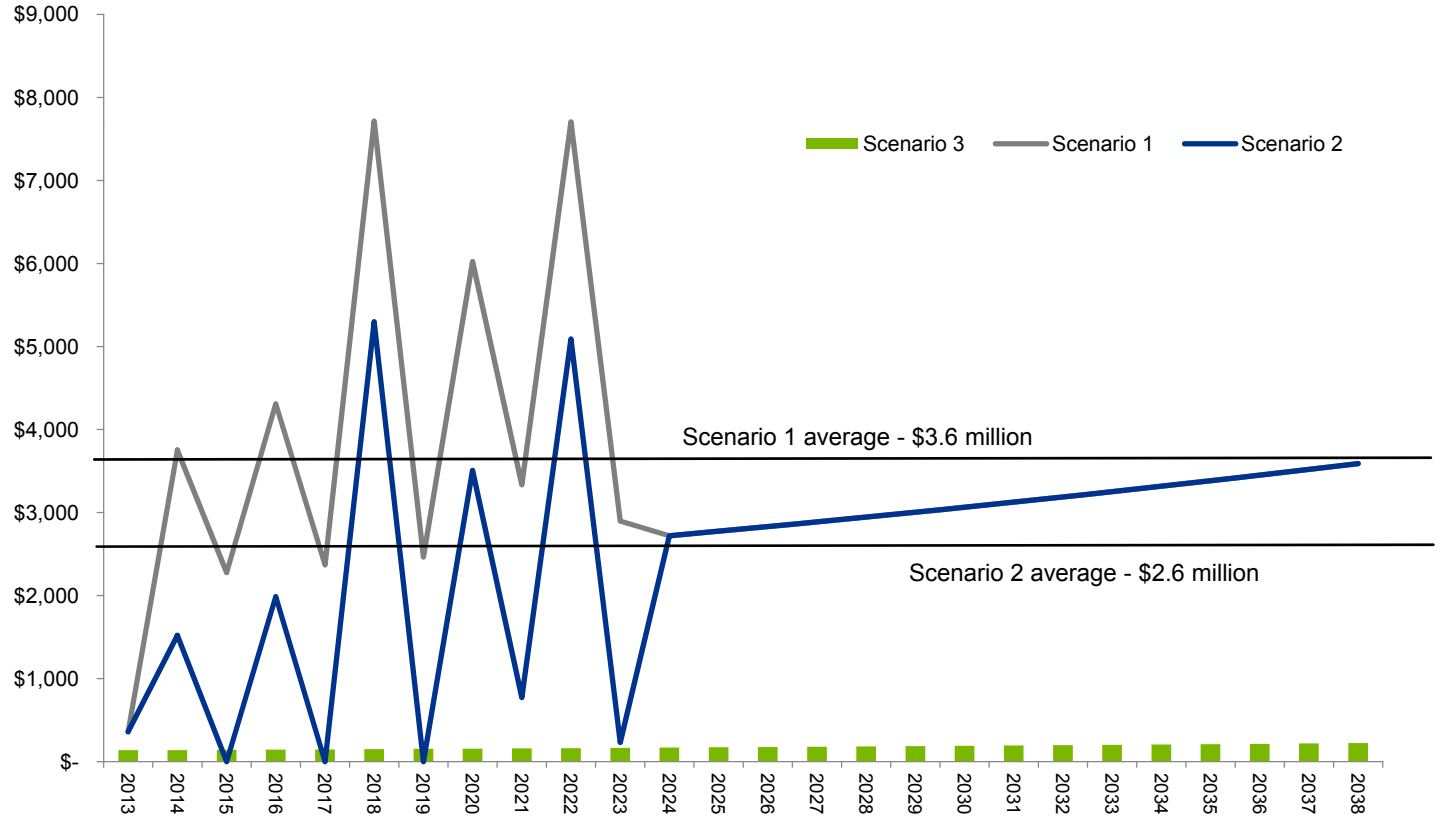
In developing the financial strategy, three alternative scenarios were considered:

- **Scenario 1** – Representing the base case scenario, this scenario reflects the assumption that all identified asset management requirements (immediate and long-term contributions) will be incurred by the Municipality. This represents the worst case scenario as it involves the highest level of capital financing requirement and ultimately is not practical due to the increase in municipal revenues necessary to support the required level of capital investment.
- **Scenario 2 –** Under this scenario, the Municipality's capital expenditures are projected to be as follows:
  - During the first 10 years of the planning period, the Municipality will make capital investments based on the identified priority infrastructure investment requirements (i.e. $1.6 million per year).
  - During the remainder of the planning period, the Municipality will make capital investments equal to the amount of the sustainable life cycle contribution requirements (i.e. $2.2 million per year).
- **Scenario 3 –** Under this scenario, it is assumed that the Municipality will continue to make capital investments based on the amount of capital expenditures in 2012 that were not funded through grants (i.e. $139,000 per year).

Projected Financial Performance

Financial projections developed in support of the asset management plan demonstrate both the magnitude and immediacy of the Municipality's identified capital requirements, with the required level of capital expenditures under Scenarios 1 and 2 significantly higher than the current level. At the same time, the average residential taxes per household is expected to increase accordingly if taxpayers are solely responsible for funding the capital requirements.

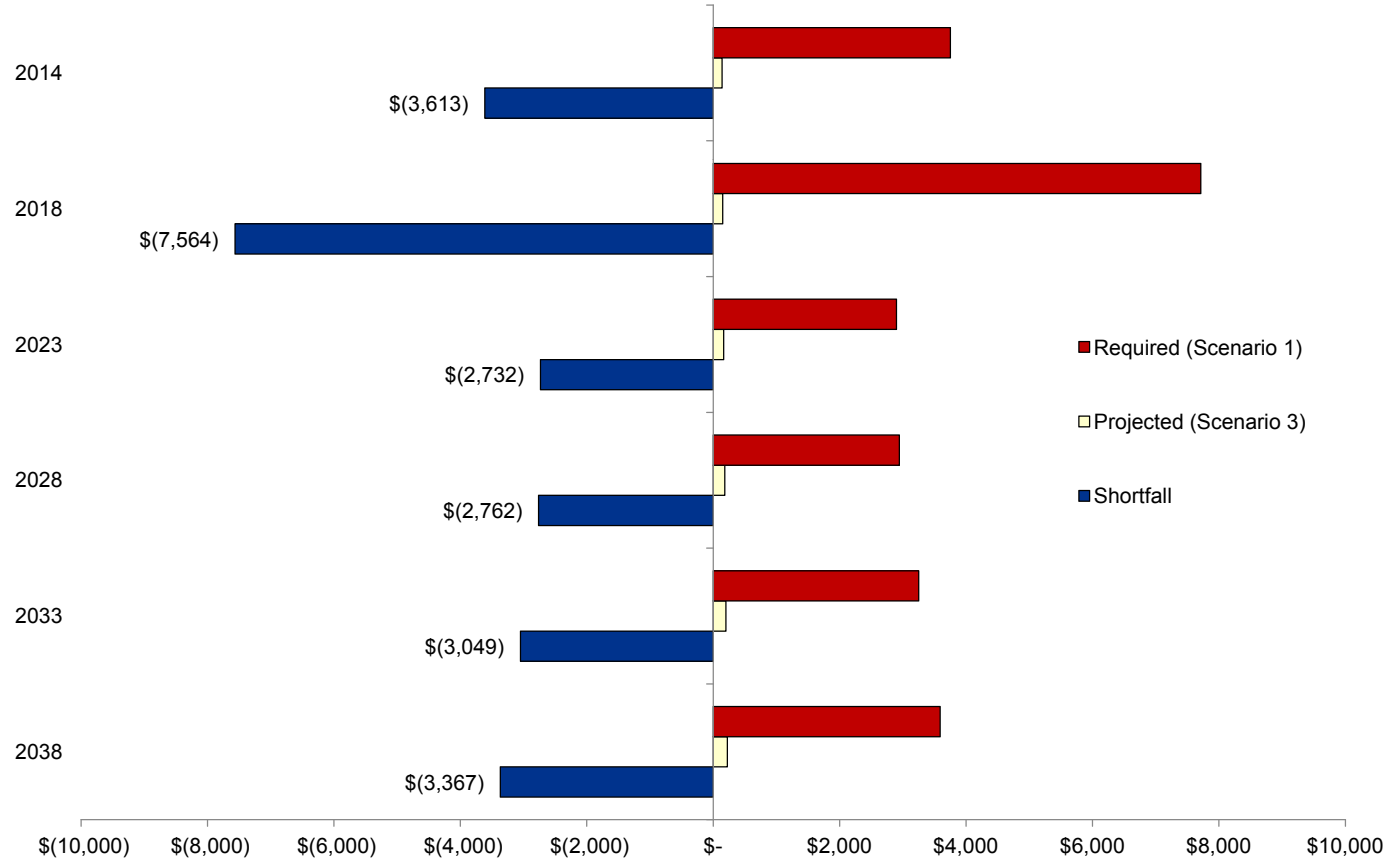
Projected capital expenditures (in thousands)



Projected Financial Performance

At the current level of capital expenditures, the Municipality is expected to continue its existing annual infrastructure deficit as its level of capital expenditures will be insufficient to maintain its infrastructure in its present state, let alone address immediate and short-term infrastructure requirements. As noted below, the Municipality's current annual funding shortfall is expected to be $3 million on an ongoing basis, assuming that the Municipality addresses its immediate infrastructure requirements.

Calculated annual infrastructure funding shortfalls (in thousands)



Financing Strategies

A suggested five year capital financing policy is included as **Appendix J**.

In order to address the current and future shortfalls in capital funding, the Municipality has identified the following potential courses of action:

1. **Five year capital levy**. In order to address the immediate and short-term infrastructure requirements, the Municipality is contemplating the introduction of a five year capital levy that would see the total municipal levy increase by 2% per year in order to fund capital expenditures. The proceeds from this capital levy would either be expended during the year, used to finance debt servicing costs for infrastructure related borrowings or placed in a reserve fund until such time as the funds are required (the Municipality adopts a similar approach for Federal Gas Tax, which is sometimes 'banked' until sufficient funds are accumulated to finance capital projects). As noted below, the introduction of a five year capital levy is expected to provide an additional $157,000 for capital purposes, representing a 112% increase in capital expenditures over the next five years.

Impact of five year, 2% capital levy on taxation and capital spending (in thousands)

Year	Municipal Levy			Capital Expenditures		
	Prior Year's Levy	Capital Levy Increase	Current Year's Levy	Prior Year's Expenditures	New Funding	Current Year's Expenditures
2014	$1,510	$30	$1,540	$139	$30	$169
2015	$1,540	$31	$1,571	$169	$31	$200
2016	$1,571	$31	$1,602	$200	$31	$231
2017	$1,602	$32	$1,634	$231	$32	$263
2018	$1,634	$33	$1,667	$263	$33	$296
Average annual increase in municipal levy			2.0%	Increase in capital expenditures		112%

The adoption and annual renewal of a capital levy is subject to the Municipality's annual budget process. In order to assist with establishing the levy, we have included a suggested capital financing policy as Appendix N.

Financing Strategies

A suggested borrowing policy is included as **Appendix K**.

2. **Use of borrowing for infrastructure investments**. Historically, the Municipality has relied on borrowings as a means of funding infrastructure investments, with the Municipality currently having outstanding long-term debt in respect of its water and wastewater infrastructure. On an ongoing basis, the Municipality may wish to consider the use of debt for additional infrastructure investments, conditional upon the following:

   - The infrastructure investment will provide a stream of non-taxation revenues that can be used to fund some or all of the associated debt servicing costs; and/or
   - The Municipality requires debt financing to fund its portion of infrastructure projects that are cost shared with senior government; and/or
   - The infrastructure investment is unavoidable as a result of regulatory changes or concerns over public health and safety and cannot be funded through other means; and
   - The associated debt servicing costs would not jeopardize the Municipality's financial sustainability or result in the Municipality exceeding its annual debt repayment limit.

The use of debt financing is particularly helpful in addressing immediate capital investment requirements as it allows the Municipality to spread the cost of projects over the term of the loan. For example, the amount of capital expenditures that could potentially be financed through the Municipality's proposed capital levy could amount to as much as $2.4 million, recognizing that future capital expenditures would be limited as the financing is directed towards debt servicing, not infrastructure investments. Alternatively, the Municipality may wish to adopted a phased approach to debt financing, whereby a fixed percentage of capital expenditures would be financed through debentures during the capital levy period.

Potential debt financed through five year capital levy

Year	Capital Levy	10 Year Loan (3.09%)	20 Year Loan (3.90%)	25 Year Loan (4.11%)
2014	$30	$256	$411	$462
2015	$31	$264	$425	$479
2016	$31	$264	$425	$479
2017	$32	$272	$439	$494
2018	$33	$280	$453	$511
Total	$157	$1,335	$2,154	$2,425

In addition to the issuance of new debt, the Municipality can also redirect funds currently used to service existing debt towards capital expenditures once the debt is repaid. By reinvesting these funds in capital or using them to pay for new infrastructure loans (as opposed to reducing the municipal levy upon the repayment of the existing loans), the Municipality can further increase its funding for capital purposes.

Potential Strategies

3. **Asset rationalization**. In addition to strategies designed to increase the level of financing for capital expenditures, the Municipality will also consider reducing its investment requirements through the rationalization of its infrastructure, including:
   - Abandoning portions of the municipal road network that have very low traffic levels; or
   - Downgrading paved roads to either surface treatment or gravel.

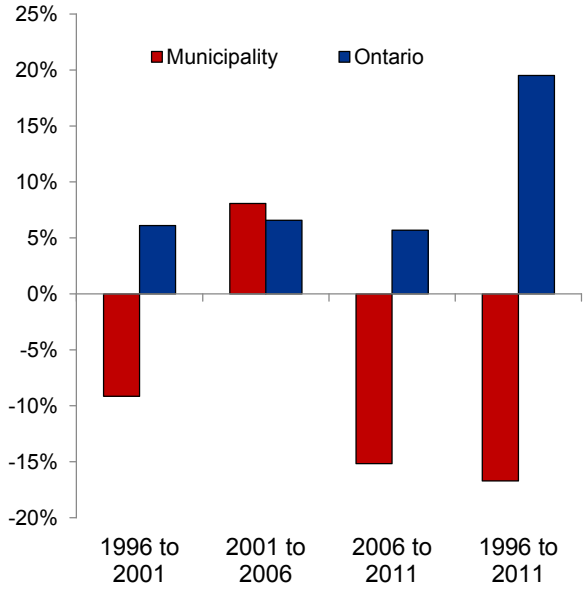
Affordability and the Need for Grants

Despite the ability of the Municipality to increase the level of financing for infrastructure investments and other asset management activities, the magnitude of the financial requirement associated with its infrastructure precludes the Municipality from addressing its needs without some form of grants. In the absence of capital grants, the Municipality will be required to defer capital expenditures until such time as sufficient funding is available.

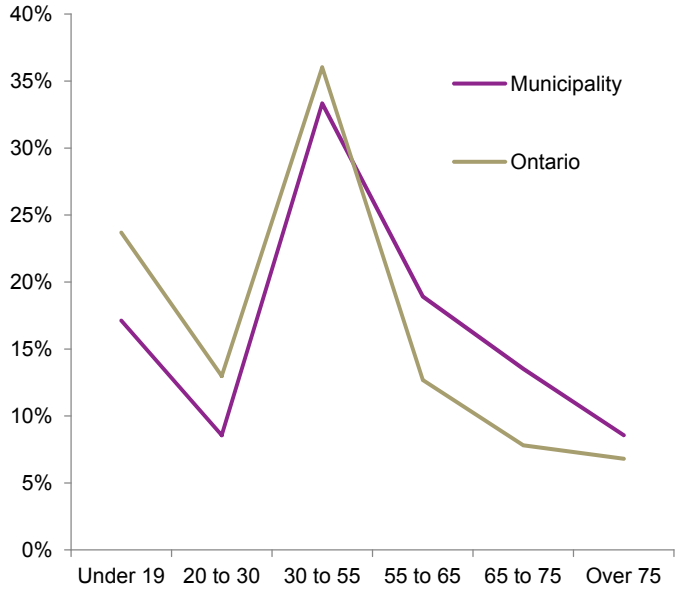
While it is expected that most, if not all, Ontario municipalities will be challenged to meet their financial requirements associated with infrastructure, the Province should give particular attention to the Municipality's limited ability to fund capital investments in comparison to other municipalities, based on the following:

- From 1996 to 2011, ***the Municipality's total population has decreased by 16.7%***, compared to a 19.5% increase in the Province's population over the same period.
- At the same time, ***the Municipality's population has aged faster than the Provincial average***, with the median age of the Municipality's residents amounting to 50.9 years compared to the Provincial median age of 42.5 years.

Population changes – 1996 to 2011



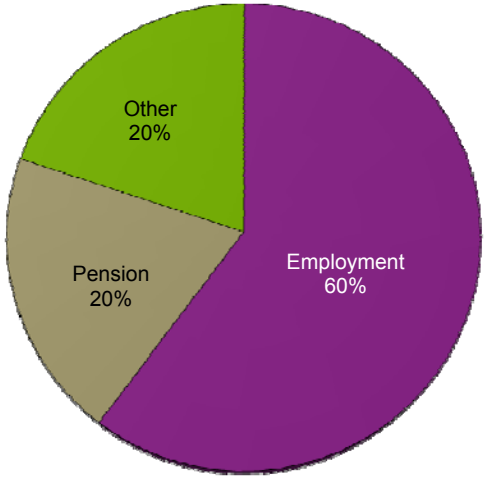
Population distribution by age group (2011)



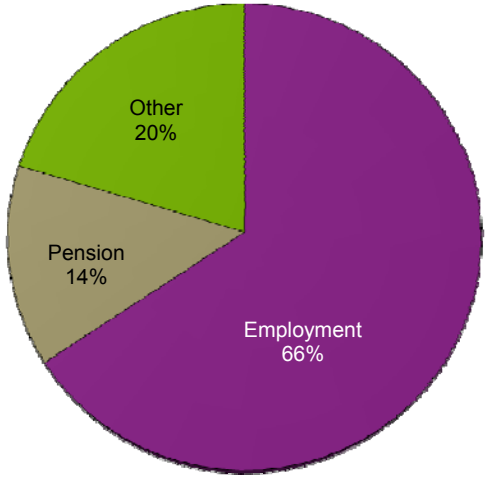
Affordability and the Need for Grants

- ***Residents of the Municipality are more reliant on pension incomes*** than the remainder of the Province, limiting their ability to afford ongoing property tax increases. Additionally, the percentage of personal income generated from employment has decreased from 68% in 2002 to 60% in 2009, while pension incomes have risen from 14% of total incomes to 20%.

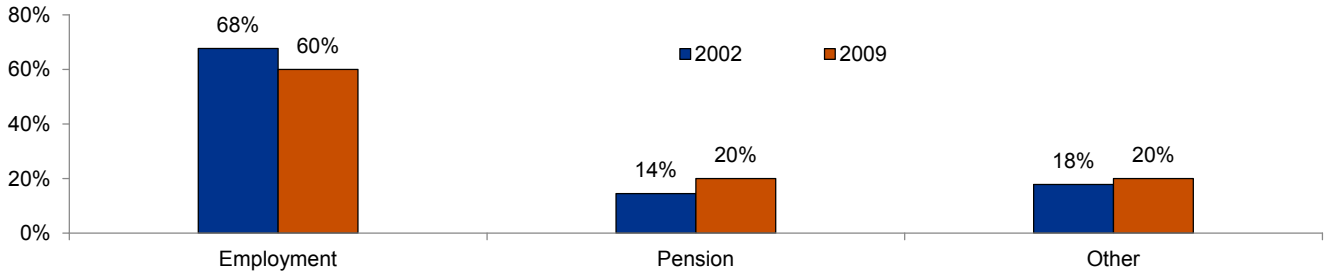
Reported personal income by source – Municipality residents (2009)



Reported personal income by source – Provincial residents (2009)



Reported personal income by source – Municipality residents (2002 vs. 2009)



Affordability and the Need for Grants

In addition to the challenges posed by the changing nature of its demographics, the Municipality is facing additional financial pressures from an operational perspective, including:

- The continuing impacts of inflation, including wage settlements and higher benefit costs, which increase the Municipality's operating expenditures
- Announced reductions in government funding programs, including planned reductions in OMPF funding and decreases in Federal Gas Tax funding

In light of its affordability constraints, the Municipality recognizes and appreciates the importance of programs such as the Municipal Infrastructure Investment Initiative and the Small, Rural and Northern Municipal Infrastructure Fund. That said, the current approach to allocating funding to municipalities is extremely problematic from a planning perspective:

- Unlike Federal Gas Tax, which is provided to municipalities as a recurring stream of known funding, the current Provincial infrastructure programs are based on applications with no guarantee of funding success. Accordingly, municipalities are unable to 'bank' Provincial infrastructure funding to finance larger capital projects, use proceeds as a source of funding for borrowing costs incurred in connection with infrastructure investments, or plan beyond the current funding submissions.
- The requirement for municipalities to apply for funding through the completion of expressions of interest can be a challenge, particularly for smaller municipalities with limited resources. In a number of instances, smaller municipalities are required to divert staff from other priorities or incur costs for outside consultants in order to complete the required expressions of interest, with no certainty that they will actually obtain funding.

As a means of maximizing the effectiveness of its capital financing programs, the Municipality requests that the Province consider the following:

- Supplementing the current competitive, application based funding process with a committed stream of funding to eligible municipalities, thereby supporting long-term planning for infrastructure needs. This dual stream of funding will provide regular annual funding for smaller infrastructure investments, while larger projects could be funded through the application based approach;
- Review the basis for allocating funding to communities, with increased emphasis placed on smaller communities that are challenged to meet their infrastructure needs due to limited assessment growth, higher than average population decreases and lower than average non-residential assessment, all of which pose challenges from an affordability perspective.
- Extending the eligibility requirement for funding programs to include other components of municipal infrastructure that are critical to a community's success, including vehicles, recreational and cultural assets.

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Asset Management Planning
for the Township of Moonbeam

Chapter VI
Asset Management Plan Cross Reference

Congruence with Provincial Requirements

In this section of the report, the Municipality's asset management plan has been cross-referenced to the requirements outlined in *Building Together – Guide for Municipal Asset Management Plans* as a means of demonstrating that the Municipality has met the Province's expectations for asset management plans submitted under the Municipal Infrastructure Investment Initiative.

Required Section	Content	Location in Asset Management Plan
Executive summary		Pages 4 to 8
Introduction	• explains how the goals of the municipality are dependent on Infrastructure • clarifies the relationship of the asset management plan to municipal planning and financial documents • describes to the public the purpose of the asset management plan • states which infrastructure assets are included in the plan. Best practice is to develop a plan that covers all infrastructure assets for which the municipality is responsible. At a minimum, plans should cover roads, bridges, water and wastewater systems, and social housing • identifies how many years the asset management plan covers and when it will be updated. At a minimum, plans must cover 10 years and be updated regularly. Best practice is for plans to cover the entire lifecycle of assets • describes how the asset management plan was developed — who was involved, what resources were used, any limitations, etc. • identifies how the plan will be evaluated and improved through clearly defined actions. Best practice is for actions to be short-term (less than three years) and include a timetable for implementation	Chapter I
State of local infrastructure	• asset types (e.g. urban arterial road, rural arterial road, watermains) and quantity/extent (e.g. length in kilometres for linear assets). • financial accounting valuation and replacement cost valuation. • asset age distribution and asset age as a proportion of expected useful life. • asset condition (e.g. proportion of assets in "good," "fair" and "poor" condition). Asset condition must be assessed according to standard engineering practices. For bridge structures, condition is based on an analysis of bridge inspection reports. • discusses how and when information regarding the characteristics, value, and condition of assets will be updated.	Chapter II

Congruence with Provincial Requirements

Required Section	Content	Location in Asset Management Plan
Desired level of service	• defines levels of service through performance measures, targets and timeframes to achieve the targets if they are not already being achieved. • discusses any external trends or issues that may affect expected levels of service or the municipality's ability to meet them • shows current performance relative to the targets set out	Chapter III
Asset management strategy	• non-infrastructure solutions – actions or policies that can lower costs or extend asset life (e.g., better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.) • maintenance activities – including regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events • renewal/rehabilitation activities – significant repairs designed to extend the life of the asset. For example, the lining of iron watermains can defer the need for replacement • replacement activities – activities that are expected to occur once an asset has reached the end of its useful life and renewal/ rehabilitation is no longer an option • disposal activities – the activities associated with disposing of an asset once it has reached the end of its useful life, or is otherwise no longer needed by the municipality • expansion activities (if necessary) – planned activities required to extend services to previously unserviced areas - or expand services to meet growth demands • discusses procurement methods • includes an overview of the risks associated with the strategy and any actions that will be taken in response.	Chapter IV

Financial strategy	• shows yearly expenditure forecasts broken down by:
	  • Non-infrastructure solutions
	  • Maintenance activities
	  • Renewal/rehabilitation activities
	  • Replacement activities
	  • Disposal activities
	  • Expansion activities (if necessary)
	• provides actual expenditures for these categories for comparison purposes.
	• gives a breakdown of yearly revenues by confirmed source
	• discusses key assumptions and alternative scenarios where appropriate.
	• identifies any funding shortfall relative to financial requirements that cannot be eliminated and discuss the impact of the shortfall and how the impact will be managed.
		Chapter V

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Asset Management Planning
for the Township of Moonbeam

Appendix A
Infrastructure Profile
Roads

Municipality Of Moonbeam
Asset Management Plan
Road Management Plan

ROAD	Section Start	Section End	Length (km)	Condition Rating	Surface Type	Type of road	Replacement Cost per KM	Total Replacement Cost	Life Cycle Cost per KM	Total Life Cycle Cost	Length by Condition Rating		
											Good	Fair	Poor
Chain of Lakes Road	TransCanada Hwy	Ste Marie Rd.	3.8	5.50	GR	Rural gravel	$ 555,003	$ 2,109,011	$ 1,127,581	$ 4,284,808	-	3.80	-
Chain of Lakes Road	Ste Marie Rd.	St. Jean Rd.	2.5	5.50	GR	Rural gravel	$ 555,003	$ 1,387,508	$ 1,127,581	$ 2,818,953	-	2.50	-
Chain of Lakes Road	St. Jean Rd.	To End/Unknown Rd	3.1	5.50	GR	Rural gravel	$ 555,003	$ 1,720,509	$ 1,127,581	$ 3,495,501	-	3.10	-
Jean Road	Gredger Rd.	To end	0.3	5.50	GR	Rural gravel	$ 555,003	$ 166,501	$ 1,127,581	$ 338,274	-	0.30	-
Windy Point Road	Walker Rd.	To end	1.2	5.50	GR	Rural gravel	$ 555,003	$ 666,004	$ 1,127,581	$ 1,353,097	-	1.20	-
Beauvais Road	TransCanada Hwy	Ste Marie Rd.	2.7	6.00	GR	Rural gravel	$ 555,003	$ 1,498,508	$ 1,127,581	$ 3,044,469	2.70	-	-
Beauvais Road	Ste Marie Rd.	To end	2.4	6.00	GR	Rural gravel	$ 555,003	$ 1,332,007	$ 1,127,581	$ 2,706,194	2.40	-	-
Bonner Lake Road	Provincial Park Rd.	To end	0.45	6.00	GR	Rural gravel	$ 555,003	$ 249,751	$ 1,127,581	$ 507,411	0.45	-	-
Gredger Road	Ste Marie Rd.	To end	1.1	6.00	GR	Rural gravel	$ 555,003	$ 610,503	$ 1,127,581	$ 1,240,339	1.10	-	-
Des Peres Road	Walker Rd.	To end	1.4	6.00	GR	Rural gravel	$ 555,003	$ 777,004	$ 1,127,581	$ 1,578,613	1.40	-	-
Fanning Lake Road (N/S)	TransCanada Hwy	Fanning Lake Road (E/W)	1.8	6.00	GR	Rural gravel	$ 555,003	$ 999,005	$ 1,127,581	$ 2,029,646	1.80	-	-
Fanning Lake Road (E/W)	East End	To end	1.2	6.00	GR	Rural gravel	$ 555,003	$ 666,004	$ 1,127,581	$ 1,353,097	1.20	-	-
Girouard Street	N/A	N/A	0.095	6.00	GR	Rural gravel	$ 555,003	$ 52,725	$ 1,127,581	$ 107,120	0.10	-	-
Knowles	N/A	N/A	0.2	6.00	GR	Rural gravel	$ 555,003	$ 111,001	$ 1,127,581	$ 225,516	0.20	-	-
Lecuyer Road	N/A	N/A	0.1	6.00	GR	Rural gravel	$ 555,003	$ 55,500	$ 1,127,581	$ 112,758	0.10	-	-
Nursery Road	Unknown Rd.	St. Joseph's Rd.	2.4	6.00	GR	Rural gravel	$ 555,003	$ 1,332,007	$ 1,127,581	$ 2,706,194	2.40	-	-
Rocky Point Rd	Walker Rd.	To end	0.3	6.00	GR	Rural gravel	$ 555,003	$ 166,501	$ 1,127,581	$ 338,274	0.30	-	-
Sailing Club Road (E/W)	ON 581	To end	1.8	6.00	GR	Rural gravel	$ 555,003	$ 999,005	$ 1,127,581	$ 2,029,646	1.80	-	-
St Jean Road	Chain of Lakes Rd.	Beauvais Rd.	3	6.00	GR	Rural gravel	$ 555,003	$ 1,665,009	$ 1,127,581	$ 3,382,743	3.00	-	-
Ste. Marie Road	Beauvais Rd.	D'Amours Rd.	3	6.00	GR	Rural gravel	$ 555,003	$ 1,665,009	$ 1,127,581	$ 3,382,743	3.00	-	-
Ste. Marie Road	D'Amours Rd.	St. Amour Rd.	3.1	6.00	GR	Rural gravel	$ 555,003	$ 1,720,509	$ 1,127,581	$ 3,495,501	3.10	-	-
Albert Street	Hwy 11	Leonard Ave.	0.192	6.50	HCB	Rural paved	$ 1,933,493	$ 371,231	$ 4,837,733	$ 928,845	0.19	-	-
Albert Street	Leonard Ave.	St. Aubin Ave.	0.11	6.50	HCB	Rural paved	$ 1,933,493	$ 212,684	$ 4,837,733	$ 532,151	0.11	-	-
Albert Street	St Aubin Ave	Pelletier Ave	0.157	6.50	HCB	Rural paved	$ 1,933,493	$ 303,558	$ 4,837,733	$ 759,524	0.16	-	-
Hillcrest road	N/A	N/A	0.2	6.50	HCB	Rural paved	$ 1,933,493	$ 386,699	$ 4,837,733	$ 967,547	0.20	-	-
Leonard Avenue	ON 581	Albert St.	0.35	7.00	HCB	Rural paved	$ 1,933,493	$ 676,723	$ 4,837,733	$ 1,693,207	0.35	-	-
Leonard Avenue	Albert St.	Paquette St	0.25	7.00	HCB	Rural paved	$ 1,933,493	$ 483,373	$ 4,837,733	$ 1,209,433	0.25	-	-
Leonard Avenue	Paquette St.	St. Joseph's St.	0.14	7.00	HCB	Rural paved	$ 1,933,493	$ 270,689	$ 4,837,733	$ 677,283	0.14	-	-
Leonard Avenue	St. Joseph's St.	TransCanada Hwy	0.3	7.00	HCB	Rural paved	$ 1,933,493	$ 580,048	$ 4,837,733	$ 1,451,320	0.30	-	-
Bayview Road	Walker Rd.	To end	1.4	6.50	GR	Rural gravel	$ 555,003	$ 777,004	$ 1,127,581	$ 1,578,613	1.40	-	-
Lakeview Dr	Lefebvre Rd.	Lefebvre Rd.	0.4	6.50	GR	Rural gravel	$ 555,003	$ 222,001	$ 1,127,581	$ 451,032	0.40	-	-
Nursery Road	St. Joseph's Rd.	TransCanada Hwy	2.4	6.50	GR	Rural gravel	$ 555,003	$ 1,332,007	$ 1,127,581	$ 2,706,194	2.40	-	-
St Joseph Road	Hwy 581	To End	4.6	6.50	GR	Rural gravel	$ 555,003	$ 2,553,014	$ 1,127,581	$ 5,186,873	4.60	-	-
Ste. Marie Road	Chain of Lakes Rd.	Gredger Rd.	0.4	6.50	GR	Rural gravel	$ 555,003	$ 222,001	$ 1,127,581	$ 451,032	0.40	-	-
Ste. Marie Road	Gredger Rd.	Beauvais Rd.	2	6.50	GR	Rural gravel	$ 555,003	$ 1,110,006	$ 1,127,581	$ 2,255,162	2.00	-	-
Walker Rd	Des Peres Rd.	Bayview Rd	1.2	6.50	GR	Rural gravel	$ 555,003	$ 666,004	$ 1,127,581	$ 1,353,097	1.20	-	-
Walker Rd	Bayview Rd	Windy Point Rd	2	6.50	GR	Rural gravel	$ 555,003	$ 1,110,006	$ 1,127,581	$ 2,255,162	2.00	-	-
Walker Rd	Windy Point Rd	To end	1.9	6.50	GR	Rural gravel	$ 555,003	$ 1,054,506	$ 1,127,581	$ 2,142,404	1.90	-	-
Cimon Street	Leonard Ave.	To End	0.318	7.50	HCB	Rural paved	$ 1,933,493	$ 614,851	$ 4,837,733	$ 1,538,399	0.32	-	-
Corbeil Street	St. Aubin Ave.	Pelletier Ave	0.13	7.50	HCB	Rural paved	$ 1,933,493	$ 251,354	$ 4,837,733	$ 628,905	0.13	-	-
Pelletier Avenue	Albert St.	Corbeil St	0.2	7.50	HCB	Rural paved	$ 1,933,493	$ 386,699	$ 4,837,733	$ 967,547	0.20	-	-
Pelletier Avenue	Corbeil St.	Brunelle Ave.	0.14	7.50	HCB	Rural paved	$ 1,933,493	$ 270,689	$ 4,837,733	$ 677,283	0.14	-	-
Pelletier Avenue	Brunelle Ave.	St. Joseph's St.	0.09	7.50	HCB	Rural paved	$ 1,933,493	$ 174,014	$ 4,837,733	$ 435,396	0.09	-	-
Pelletier Avenue	St. Joesph's St.	Cimon St.	0.17	7.50	HCB	Rural paved	$ 1,933,493	$ 328,694	$ 4,837,733	$ 822,415	0.17	-	-
Rene Brunelle Avenue	Pelletier Ave.	To end	0.35	7.50	HCB	Rural paved	$ 1,933,493	$ 676,723	$ 4,837,733	$ 1,693,207	0.35	-	-
St. Aubin Avenue	ON 581	Albert St	0.4	7.50	HCB	Rural paved	$ 1,933,493	$ 773,397	$ 4,837,733	$ 1,935,093	0.40	-	-
St. Aubin Avenue	Albert St.	Corbeil St	0.19	7.50	HCB	Rural paved	$ 1,933,493	$ 367,364	$ 4,837,733	$ 919,169	0.19	-	-
St. Aubin Avenue	Corbeil St	St. Joseph's St.	0.23	7.50	HCB	Rural paved	$ 1,933,493	$ 444,703	$ 4,837,733	$ 1,112,679	0.23	-	-
St. Aubin Avenue	St. Joseph's St.	Cimon St.	0.18	7.50	HCB	Rural paved	$ 1,933,493	$ 348,029	$ 4,837,733	$ 870,792	0.18	-	-
St. Aubin Avenue	Cimon St.	TransCanada Hwy	0.3	7.50	HCB	Rural paved	$ 1,933,493	$ 580,048	$ 4,837,733	$ 1,451,320	0.30	-	-
Ouellette Bay Road	ON 581	Patterson Rd.	0.65	7.00	GR	Rural gravel	$ 555,003	$ 360,752	$ 1,127,581	$ 732,928	0.65	-	-
Ouellette Bay Road	Patterson Rd.	Lefebvre Rd.	0.4	7.00	GR	Rural gravel	$ 555,003	$ 222,001	$ 1,127,581	$ 451,032	0.40	-	-
Ouellette Bay Road	Lefebvre Rd.	Walker Rd.	2.1	7.00	GR	Rural gravel	$ 555,003	$ 1,165,506	$ 1,127,581	$ 2,367,920	2.10	-	-
Ouellette Bay Road	Walker Rd.	Tower Rd.	3.1	7.00	GR	Rural gravel	$ 555,003	$ 1,720,509	$ 1,127,581	$ 3,495,501	3.10	-	-
D'Amours Road	TransCanada Hwy	Ste Marie Rd.	2.7	7.00	GR	Rural gravel	$ 555,003	$ 1,498,508	$ 1,127,581	$ 3,044,469	2.70	-	-
Marco Street	ON 581	Albert St.	0.196	7.00	GR	Rural gravel	$ 555,003	$ 108,781	$ 1,127,581	$ 221,006	0.20	-	-
Paterson Road	To End	Ouellette Rd.	0.1	7.00	GR	Rural gravel	$ 555,003	$ 55,500	$ 1,127,581	$ 112,758	0.10	-	-

Municipality Of Moonbeam
Asset Management Plan
Road Management Plan

ROAD	Section Start	Section End	Length (km)	Condition Rating	Surface Type	Type of road	Replacement Cost per KM	Total Replacement Cost	Life Cycle Cost per KM	Total Life Cycle Cost	Length by Condition Rating		
											Good	Fair	Poor
Lefebvre Rd.	Ouellette Rd.	Ouellette Rd.	4.5	7.00	GR	Rural gravel	$ 555,003	$ 2,497,514	$ 1,127,581	$ 5,074,115	4.50	-	-
Rivard Road	TransCanada Hwy	To end	0.29	7.00	GR	Rural gravel	$ 555,003	$ 160,951	$ 1,127,581	$ 326,998	0.29	-	-
St Joseph Road	East End	Ski Hill Rd	1.5	7.00	GR	Rural gravel	$ 555,003	$ 832,505	$ 1,127,581	$ 1,691,372	1.50	-	-
St Joseph Road	Ski Hill Rd	Hwy 581	3.2	7.00	GR	Rural gravel	$ 555,003	$ 1,776,010	$ 1,127,581	$ 3,608,259	3.20	-	-
Ski Hill Rd	TransCanada Hwy	St. Joseph Rd	0.85	7.00	GR	Rural gravel	$ 555,003	$ 471,753	$ 1,127,581	$ 958,444	0.85	-	-
Ski Hill Rd	St. Joseph Rd	Ouellette Rd.	2.6	7.00	GR	Rural gravel	$ 555,003	$ 1,443,008	$ 1,127,581	$ 2,931,711	2.60	-	-
Ski Hill Rd	Ouellette Rd.	Des Peres Rd.	2.6	7.00	GR	Rural gravel	$ 555,003	$ 1,443,008	$ 1,127,581	$ 2,931,711	2.60	-	-
Paquette Street	TransCanada Hwy	Leonard Ave.	0.223	8.00	HCB	Rural paved	$ 1,933,493	$ 431,169	$ 4,837,733	$ 1,078,814	0.22	-	-
Paquette Street	Leonard Ave.	St. Aubin Ave.	0.11	8.00	HCB	Rural paved	$ 1,933,493	$ 212,684	$ 4,837,733	$ 532,151	0.11	-	-
Street Joseph Street	TransCanada Hwy	Leonard Ave.	0.12	8.00	HCB	Rural paved	$ 1,933,493	$ 232,019	$ 4,837,733	$ 580,528	0.12	-	-
Street Joseph Street	Leonard Ave.	St. Aubin Ave.	0.1	8.00	HCB	Rural paved	$ 1,933,493	$ 193,349	$ 4,837,733	$ 483,773	0.10	-	-
Street Joseph Street	St. Aubin Ave.	Pelletier Ave	0.12	8.00	HCB	Rural paved	$ 1,933,493	$ 232,019	$ 4,837,733	$ 580,528	0.12	-	-
Gibson	N/A	N/A	0.2	7.50	GR	Rural gravel	$ 555,003	$ 111,001	$ 1,127,581	$ 225,516	0.20	-	-
Tower Road	Ouellette Rd.	TransCanada Hwy	0.7	7.50	GR	Rural gravel	$ 555,003	$ 388,502	$ 1,127,581	$ 789,307	0.70	-	-
			83.001					$ 53,054,748		$ 112,400,821	72.10	10.90	-

Total - gravel	77.93	43,251,938.79	87,873,514.91	67.03	10.90	-
Total - paved	5.07	9,802,809.51	24,527,306.31	5.07	-	-
Total	83.00	53,054,748.30	112,400,821.22	72.10	10.90	-

Percentage - gravel	86.0%	14.0%	0.0%
Percentage - paved	100.0%	0.0%	0.0%
Percentage - total	86.9%	13.1%	0.0%

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ROAD	Section Start	Section End	Length (km)	Roadside Environ.	Surface Type	Type of Work to be Done	1 - 5 YR Road Improvement Expenditures									
							2013		2014		2015		2016		2017	
							C.R.	$	C.R.	$	C.R.	$	C.R.	$	C.R.	$
Chain of Lakes Road	TransCanada Hwy	Ste Marie Rd.	3.8	R	GR	Resurfacing	5.50		5.25		5.00		4.75	$666,098.20	7.50	
Chain of Lakes Road	Ste Marie Rd.	St. Jean Rd.	2.5	R	GR	Resurfacing	5.50		5.25		5.00		4.75	$438,222.50	7.50	
Chain of Lakes Road	St. Jean Rd.	To End/Unknown Rd	3.1	R	GR	Resurfacing	5.50		5.25		5.00		4.75	$543,395.90	7.50	
Jean Road	Gredger Rd.	To end	0.3	R	GR	Resurfacing	5.50		5.25		5.00		4.75	$52,586.70	7.50	
Windy Point Road	Walker Rd.	To end	1.2	R	GR	Resurfacing	5.50		5.25		5.00		4.75	$210,346.80	7.50	
Beauvais Road	TransCanada Hwy	Ste Marie Rd.	2.7	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Beauvais Road	Ste Marie Rd.	To end	2.4	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Bonner Lake Road	Provincial Park Rd.	To end	0.45	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Gredger Road	Ste Marie Rd.	To end	1.1	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Des Peres Road	Walker Rd.	To end	1.4	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Fanning Lake Road (N/S)	TransCanada Hwy	Fanning Lake Road (E/W)	1.8	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Fanning Lake Road (E/W)	East End	To end	1.2	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Girouard Street	N/A	N/A	0.095	SU	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Knowles	N/A	N/A	0.2	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Lecuyer Road	N/A	N/A	0.1	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Nursery Road	Unknown Rd.	St. Joseph's Rd.	2.4	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Rocky Point Rd	Walker Rd.	To end	0.3	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Sailing Club Road (E/W)	ON 581	To end	1.8	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
St Jean Road	Chain of Lakes Rd.	Beauvais Rd.	3	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Ste. Marie Road	Beauvais Rd.	D'Amours Rd.	3	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Ste. Marie Road	D'Amours Rd.	St. Amour Rd.	3.1	R	GR	Resurfacing	6.00		5.75		5.50		5.25		5.00	
Albert Street	Hwy 11	Leonard Ave.	0.192	SU	HCB	Resurfacing	6.50		6.17		5.84		5.51		5.18	
Albert Street	Leonard Ave.	St. Aubin Ave.	0.11	SU	HCB	Resurfacing	6.50		6.17		5.84		5.51		5.18	
Albert Street	St Aubin Ave	Pelletier Ave	0.157	SU	HCB	Resurfacing	6.50		6.17		5.84		5.51		5.18	
Hillcrest road	N/A	N/A	0.2	R	HCB	Resurfacing	6.50		6.17		5.84		5.51		5.18	
Leonard Avenue	ON 581	Albert St.	0.35	SU	HCB	Resurfacing	7.00		6.67		6.34		6.01		5.68	
Leonard Avenue	Albert St.	Paquette St	0.25	SU	HCB	Resurfacing	7.00		6.67		6.34		6.01		5.68	
Leonard Avenue	Paquette St.	St. Joseph's St.	0.14	SU	HCB	Resurfacing	7.00		6.67		6.34		6.01		5.68	
Leonard Avenue	St. Joseph's St.	TransCanada Hwy	0.3	SU	HCB	Resurfacing	7.00		6.67		6.34		6.01		5.68	
Bayview Road	Walker Rd.	To end	1.4	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Lakeview Dr	Lefebvre Rd.	Lefebvre Rd.	0.4	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Nursery Road	St. Joseph's Rd.	TransCanada Hwy	2.4	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
St Joseph Road	Hwy 581	To End	4.6	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Ste. Marie Road	Chain of Lakes Rd.	Gredger Rd.	0.4	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Ste. Marie Road	Gredger Rd.	Beauvais Rd.	2	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Walker Rd	Des Peres Rd.	Bayview Rd	1.2	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Walker Rd	Bayview Rd	Windy Point Rd	2	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Walker Rd	Windy Point Rd	To end	1.9	R	GR	Resurfacing	6.50		6.25		6.00		5.75		5.50	
Cimon Street	Leonard Ave.	To End	0.318	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Corbeil Street	St. Aubin Ave.	Pelletier Ave	0.13	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Pelletier Avenue	Albert St.	Corbeil St	0.2	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Pelletier Avenue	Corbeil St.	Brunelle Ave.	0.14	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Pelletier Avenue	Brunelle Ave.	St. Joseph's St.	0.09	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Pelletier Avenue	St. Joesph's St.	Cimon St.	0.17	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Rene Brunelle Avenue	Pelletier Ave.	To end	0.35	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
St. Aubin Avenue	ON 581	Albert St	0.4	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
St. Aubin Avenue	Albert St.	Corbeil St	0.19	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
St. Aubin Avenue	Corbeil St	St. Joseph's St.	0.23	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
St. Aubin Avenue	St. Joseph's St.	Cimon St.	0.18	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
St. Aubin Avenue	Cimon St.	TransCanada Hwy	0.3	SU	HCB	Resurfacing	7.50		7.17		6.84		6.51		6.18	
Ouellette Bay Road	ON 581	Patterson Rd.	0.65	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ouellette Bay Road	Patterson Rd.	Lefebvre Rd.	0.4	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ouellette Bay Road	Lefebvre Rd.	Walker Rd.	2.1	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ouellette Bay Road	Walker Rd.	Tower Rd.	3.1	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
D'Amours Road	TransCanada Hwy	Ste Marie Rd.	2.7	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Marco Street	ON 581	Albert St.	0.196	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Paterson Road	To End	Ouellette Rd.	0.1	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Lefebvre Rd.	Ouellette Rd.	Ouellette Rd.	4.5	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Rivard Road	TransCanada Hwy	To end	0.29	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	

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ROAD	Section Start	Section End	Length (km)	Roadside Environ.	Surface Type	Type of Work to be Done	1 - 5 YR Road Improvement Expenditures									
							2013		2014		2015		2016		2017	
							C.R.	$	C.R.	$	C.R.	$	C.R.	$	C.R.	$
St Joseph Road	East End	Ski Hill Rd	1.5	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
St Joseph Road	Ski Hill Rd	Hwy 581	3.2	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ski Hill Rd	TransCanada Hwy	St. Joseph Rd	0.85	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ski Hill Rd	St. Joseph Rd	Ouellette Rd.	2.6	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Ski Hill Rd	Ouellette Rd.	Des Peres Rd.	2.6	R	GR	Resurfacing	7.00		6.75		6.50		6.25		6.00	
Paquette Street	TransCanada Hwy	Leonard Ave.	0.223	SU	HCB		8.00		7.67		7.34		7.01		6.68	
Paquette Street	Leonard Ave.	St. Aubin Ave.	0.11	SU	HCB		8.00		7.67		7.34		7.01		6.68	
Street Joseph Street	TransCanada Hwy	Leonard Ave.	0.12	SU	HCB		8.00		7.67		7.34		7.01		6.68	
Street Joseph Street	Leonard Ave.	St. Aubin Ave.	0.1	SU	HCB		8.00		7.67		7.34		7.01		6.68	
Street Joseph Street	St. Aubin Ave.	Pelletier Ave	0.12	SU	HCB		8.00		7.67		7.34		7.01		6.68	
Gibson	N/A	N/A	0.2	R	GR		7.50		7.25		7.00		6.75		6.50	
Tower Road	Ouellette Rd.	TransCanada Hwy	0.7	R	GR		7.50		7.25		7.00		6.75		6.50	
					Average Conditi		6.75		6.47		6.19		5.91		5.85	
								$0.00		**$0.00**		**$0.00**		**$1,910,650.10**		**$0.00**

Notes:
Life Cycle time differs based on road structures & materials used. Life cycles for this study are as follows.
Granular - GR - 75 Years
Surface Treated - LCB- 30 Years
Paved Roads- HCB- 60 Years

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ROAD	Section Start	Section End	Length (km)	Roadside Environ.	Surface Type	Type of Work to be Done	6 -10 YR Road Improvement Expenditures									
							2018		2019		2020		2021		2022	
							C.R.	$	C.R.	$	C.R.	$	C.R.	$	C.R.	$
Chain of Lakes Road	TransCanada Hwy	Ste Marie Rd.	3.8	R	GR	Resurfacing	7.25		7.00		6.75		6.50		6.25	
Chain of Lakes Road	Ste Marie Rd.	St. Jean Rd.	2.5	R	GR	Resurfacing	7.25		7.00		6.75		6.50		6.25	
Chain of Lakes Road	St. Jean Rd.	To End/Unknown Rd	3.1	R	GR	Resurfacing	7.25		7.00		6.75		6.50		6.25	
Jean Road	Gredger Rd.	To end	0.3	R	GR	Resurfacing	7.25		7.00		6.75		6.50		6.25	
Windy Point Road	Walker Rd.	To end	1.2	R	GR	Resurfacing	7.25		7.00		6.75		6.50		6.25	
Beauvais Road	TransCanada Hwy	Ste Marie Rd.	2.7	R	GR	Resurfacing	4.75	$473,280.30	7.50		7.25		7.00		6.75	
Beauvais Road	Ste Marie Rd.	To end	2.4	R	GR	Resurfacing	4.75	$420,693.60	7.50		7.25		7.00		6.75	
Bonner Lake Road	Provincial Park Rd.	To end	0.45	R	GR	Resurfacing	4.75	$78,880.05	7.50		7.25		7.00		6.75	
Gredger Road	Ste Marie Rd.	To end	1.1	R	GR	Resurfacing	4.75	$192,817.90	7.50		7.25		7.00		6.75	
Des Peres Road	Walker Rd.	To end	1.4	R	GR	Resurfacing	4.75	$245,404.60	7.50		7.25		7.00		6.75	
Fanning Lake Road (N/S)	TransCanada Hwy	Fanning Lake Road (E/W)	1.8	R	GR	Resurfacing	4.75	$315,520.20	7.50		7.25		7.00		6.75	
Fanning Lake Road (E/W)	East End	To end	1.2	R	GR	Resurfacing	4.75	$210,346.80	7.50		7.25		7.00		6.75	
Girouard Street	N/A	N/A	0.095	SU	GR	Resurfacing	4.75	$16,652.46	10.00		9.75		9.50		9.25	
Knowles	N/A	N/A	0.2	R	GR	Resurfacing	4.75	$35,057.80	7.50		7.25		7.00		6.75	
Lecuyer Road	N/A	N/A	0.1	R	GR	Resurfacing	4.75	$17,528.90	7.50		7.25		7.00		6.75	
Nursery Road	Unknown Rd.	St. Joseph's Rd.	2.4	R	GR	Resurfacing	4.75	$420,693.60	7.50		7.25		7.00		6.75	
Rocky Point Rd	Walker Rd.	To end	0.3	R	GR	Resurfacing	4.75	$52,586.70	7.50		7.25		7.00		6.75	
Sailing Club Road (E/W)	ON 581	To end	1.8	R	GR	Resurfacing	4.75	$315,520.20	7.50		7.25		7.00		6.75	
St Jean Road	Chain of Lakes Rd.	Beauvais Rd.	3	R	GR	Resurfacing	4.75	$525,867.00	7.50		7.25		7.00		6.75	
Ste. Marie Road	Beauvais Rd.	D'Amours Rd.	3	R	GR	Resurfacing	4.75	$525,867.00	7.50		7.25		7.00		6.75	
Ste. Marie Road	D'Amours Rd.	St. Amour Rd.	3.1	R	GR	Resurfacing	4.75	$543,395.90	7.50		7.25		7.00		6.75	
Albert Street	Hwy 11	Leonard Ave.	0.192	SU	HCB	Resurfacing	4.85	$47,855.04	10.00		9.67		9.34		9.01	
Albert Street	Leonard Ave.	St. Aubin Ave.	0.11	SU	HCB	Resurfacing	4.85	$27,416.95	10.00		9.67		9.34		9.01	
Albert Street	St Aubin Ave	Pelletier Ave	0.157	SU	HCB	Resurfacing	4.85	$39,131.47	10.00		9.67		9.34		9.01	
Hillcrest road	N/A	N/A	0.2	R	HCB	Resurfacing	4.85	$83,049.00	7.50		7.17		6.84		6.51	
Leonard Avenue	ON 581	Albert St.	0.35	SU	HCB	Resurfacing	5.35		5.02		4.69	$87,235.75	10.00		9.67	
Leonard Avenue	Albert St.	Paquette St	0.25	SU	HCB	Resurfacing	5.35		5.02		4.69	$62,311.25	10.00		9.67	
Leonard Avenue	Paquette St.	St. Joseph's St.	0.14	SU	HCB	Resurfacing	5.35		5.02		4.69	$34,894.30	10.00		9.67	
Leonard Avenue	St. Joseph's St.	TransCanada Hwy	0.3	SU	HCB	Resurfacing	5.35		5.02		4.69	$74,773.50	10.00		9.67	
Bayview Road	Walker Rd.	To end	1.4	R	GR	Resurfacing	5.25		5.00		4.75	$245,404.60	7.50		7.25	
Lakeview Dr	Lefebvre Rd.	Lefebvre Rd.	0.4	R	GR	Resurfacing	5.25		5.00		4.75	$70,115.60	7.50		7.25	
Nursery Road	St. Joseph's Rd.	TransCanada Hwy	2.4	R	GR	Resurfacing	5.25		5.00		4.75	$420,693.60	7.50		7.25	
St Joseph Road	Hwy 581	To End	4.6	R	GR	Resurfacing	5.25		5.00		4.75	$806,329.40	7.50		7.25	
Ste. Marie Road	Chain of Lakes Rd.	Gredger Rd.	0.4	R	GR	Resurfacing	5.25		5.00		4.75	$70,115.60	7.50		7.25	
Ste. Marie Road	Gredger Rd.	Beauvais Rd.	2	R	GR	Resurfacing	5.25		5.00		4.75	$350,578.00	7.50		7.25	
Walker Rd	Des Peres Rd.	Bayview Rd	1.2	R	GR	Resurfacing	5.25		5.00		4.75	$210,346.80	7.50		7.25	
Walker Rd	Bayview Rd	Windy Point Rd	2	R	GR	Resurfacing	5.25		5.00		4.75	$350,578.00	7.50		7.25	
Walker Rd	Windy Point Rd	To end	1.9	R	GR	Resurfacing	5.25		5.00		4.75	$333,049.10	7.50		7.25	
Cimon Street	Leonard Ave.	To End	0.318	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$79,259.91	10.00	
Corbeil Street	St. Aubin Ave.	Pelletier Ave	0.13	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$32,401.85	10.00	
Pelletier Avenue	Albert St.	Corbeil St	0.2	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$49,849.00	10.00	
Pelletier Avenue	Corbeil St.	Brunelle Ave.	0.14	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$34,894.30	10.00	
Pelletier Avenue	Brunelle Ave.	St. Joseph's St.	0.09	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$22,432.05	10.00	
Pelletier Avenue	St. Joesph's St.	Cimon St.	0.17	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$42,371.65	10.00	
Rene Brunelle Avenue	Pelletier Ave.	To end	0.35	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$87,235.75	10.00	
St. Aubin Avenue	ON 581	Albert St	0.4	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$99,698.00	10.00	
St. Aubin Avenue	Albert St.	Corbeil St	0.19	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$47,356.55	10.00	
St. Aubin Avenue	Corbeil St	St. Joseph's St.	0.23	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$57,326.35	10.00	
St. Aubin Avenue	St. Joseph's St.	Cimon St.	0.18	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$44,864.10	10.00	
St. Aubin Avenue	Cimon St.	TransCanada Hwy	0.3	SU	HCB	Resurfacing	5.85		5.52		5.19		4.86	$74,773.50	10.00	
Ouellette Bay Road	ON 581	Patterson Rd.	0.65	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$113,937.85
Ouellette Bay Road	Patterson Rd.	Lefebvre Rd.	0.4	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$70,115.60
Ouellette Bay Road	Lefebvre Rd.	Walker Rd.	2.1	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$368,106.90
Ouellette Bay Road	Walker Rd.	Tower Rd.	3.1	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$543,395.90
D'Amours Road	TransCanada Hwy	Ste Marie Rd.	2.7	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$473,280.30
Marco Street	ON 581	Albert St.	0.196	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$34,356.64
Paterson Road	To End	Ouellette Rd.	0.1	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$17,528.90
Lefebvre Rd.	Ouellette Rd.	Ouellette Rd.	4.5	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$788,800.50
Rivard Road	TransCanada Hwy	To end	0.29	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$50,833.81

Municipality Of Moonbeam
Asset Management Plan
Road Management Plan

ROAD	Section Start	Section End	Length (km)	Roadside Environ.	Surface Type	Type of Work to be Done	6 -10 YR Road Improvement Expenditures									
							2018		2019		2020		2021		2022	
							C.R.	$	C.R.	$	C.R.	$	C.R.	$	C.R.	$
St Joseph Road	East End	Ski Hill Rd	1.5	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$262,933.50
St Joseph Road	Ski Hill Rd	Hwy 581	3.2	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$560,924.80
Ski Hill Rd	TransCanada Hwy	St. Joseph Rd	0.85	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$148,995.65
Ski Hill Rd	St. Joseph Rd	Ouellette Rd.	2.6	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$455,751.40
Ski Hill Rd	Ouellette Rd.	Des Peres Rd.	2.6	R	GR	Resurfacing	5.75		5.50		5.25		5.00		4.75	$455,751.40
Paquette Street	TransCanada Hwy	Leonard Ave.	0.223	SU	HCB		6.35		6.02		5.69		5.36		5.03	
Paquette Street	Leonard Ave.	St. Aubin Ave.	0.11	SU	HCB		6.35		6.02		5.69		5.36		5.03	
Street Joseph Street	TransCanada Hwy	Leonard Ave.	0.12	SU	HCB		6.35		6.02		5.69		5.36		5.03	
Street Joseph Street	Leonard Ave.	St. Aubin Ave.	0.1	SU	HCB		6.35		6.02		5.69		5.36		5.03	
Street Joseph Street	St. Aubin Ave.	Pelletier Ave	0.12	SU	HCB		6.35		6.02		5.69		5.36		5.03	
Gibson	N/A	N/A	0.2	R	GR		6.25		6.00		5.75		5.50		5.25	
Tower Road	Ouellette Rd.	TransCanada Hwy	0.7	R	GR		6.25		6.00		5.75		5.50		5.25	
					Average Conditi		5.57		6.27		6.00		6.42		7.06	
								$4,587,565.46		**$0.00**		**$3,116,425.50**		**$672,463.01**		**$4,344,713.15**

Notes:
Life Cycle time differs based on road structures & materials used. Life cycles for this study are as follows.
Granular - GR - 75 Years
Surface Treated - LCB- 30 Years
Paved Roads- HCB- 60 Years

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Asset Management Planning
for the Township of Moonbeam

Appendix B
Infrastructure Profile
Water

Municipality Of Moonbeam *
Asset Management Plan
Potable Water Distribution System -Mains

											Length by Condition Assessment		
Asset I.D.	Description	Section Start	Section End	Diameter	Length	Date Installed	Years Of Service	Total Life Cycle Cost Over 80 Years	Anticipated Date to Replace	Replacement Cost 2013	Good	Fair	Poor
WS1	Hwy 11	Remi Lake Road	Albert Street	150	322.4	1963	50	$293,155.74	2048	$216,365.86	-	322.40	-
WS10	St Aubin Avenue	Albert Street	Paquette Street	150	238.6	1963	50	$216,957.07	2048	$160,126.85	-	238.60	-
WS11	St Aubin Avenue	Paquette Street	Cimon Street	150	351.4	1963	50	$319,525.21	2048	$235,828.05	-	351.40	-
WS12	Cimon Street	St Aubin Avenue	Leonard Avenue	150	110.9	1963	50	$100,840.48	2048	$74,426.10	-	110.90	-
WS13	Remi Lake Road	Hwy 11	Leonard Avenue	150	92.3	1963	50	$83,927.65	2048	$61,943.45	-	92.30	-
WS14	Remi Lake Road	Leonard Avenue	St Aubin Avenue	150	121.9	1963	50	$110,842.69	2048	$81,808.31	-	121.90	-
WS15	Remi Lake Road	St Aubin Avenue	WTP	150	103	1963	50	$93,657.08	2048	$69,124.33	-	103.00	-
WS16	Remi Lake Road	WTP	North	150	115	1963	50	$104,568.58	2048	$77,177.65	-	115.00	-
WS17	Pelletier Avenue	N/A	N/A	150	285.9	1963	50	$259,966.58	2048	$191,870.35	-	285.90	-
WS18	Cimon Street	N/A	N/A	150	156	1963	50	$141,849.55	2048	$104,693.16	-	156.00	-
WS19	St Joseph Street	N/A	N/A	150	106.7	1963	50	$97,021.46	2048	$71,607.44	-	106.70	-
WS2	Hwy 11	Albert Street	Paquette Street	150	239.3	1963	50	$217,593.58	2048	$160,596.62	-	239.30	-
WS20	Cimon Street	N/A	N/A	150	53.3	1963	50	$48,465.26	2048	$35,770.16	-	53.30	-
WS21	Rene Brunelle Ave	N/A	N/A	150	272.8	1963	50	$248,054.86	2048	$183,078.81	-	272.80	-
WS22	Mario Avenue	N/A	N/A	150	138	1963	50	$125,482.30	2048	$92,613.18	-	138.00	-
WS3	Hwy 11	Paquette Street	St. Joseph Street	150	143.2	1963	50	$130,210.61	2048	$96,102.95	-	143.20	-
WS4	Hwy 11	St Joseph Street	Easement	150	108.8	1963	50	$98,930.97	2048	$73,016.77	-	108.80	-
WS5	Easement	Hwy 11	Leonard Avenue	150	91.1	1963	50	$82,836.50	2048	$61,138.12	-	91.10	-
WS6	Leonard Avenue	Remi Lake Road	Albert Street	150	350	1963	50	$318,252.20	2048	$234,888.50	-	350.00	-
WS7	Leonard Avenue	Albert Street	St Joseph Street	150	371.2	1963	50	$337,529.19	2048	$249,116.03	-	371.20	-
WS8	Leonard Avenue	St Joseph Street	Cimon Street	150	239.9	1963	50	$218,139.15	2048	$160,999.29	-	239.90	-
WS9	St Aubin Avenue	Remi Lake Road	Albert Street	150	421.2	1963	50	$382,993.79	2048	$282,671.53	-	421.20	-
					4,433			$ 4,030,801		$ 2,974,964	-	4,432.90	-
										Percentage	0%	100%	0%

Summary of Asset Replacment & Cost by Year	
Total Replacement Cost 2048	$2,974,963.52

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Asset Management Planning
for the Township of Moonbeam

Appendix C
Infrastructure Profile
Wastewater

Municipality Of Moonbeam
Asset Management Plan
Sanitary Sewer Network - Pipes

Asset I.D.	Location	Section Start	Section End	Length In Meters	Diameter	Date Installed	Years Of Service	Life Cycle Cost (80 Years)	Date to Replace	Reconstruction Cost 2013	Length by Condition Assessment		
											Good	Fair	Poor
SS1	Hwy 11	San MH 5	San MH 4	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS10	Leonard Avenue	San MH 16	San MH 15	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS11	Leonard Avenue	San MH 24	San MH 23	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS12	Leonard Avenue	San MH 15	San MH 11	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS13	Leonard Avenue	San MH 11	San MH 10	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS14	Leonard Avenue	San MH 23	San MH 22	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS15	Leonard Avenue	San MH 22	San MH 21	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS16	Leonard Avenue	San MH 21	San MH 3	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS17	Remi Lake Road	San MH 4	San MH 3	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS18	Remi Lake Road	San MH 3	San MH 1	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS19	St. Aubin Avenue	San MH 20	San MH 19	100	250	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS2	Hwy 11	San MH 6	San MH 5	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS20	St. Aubin Avenue	San MH 29	San MH 28	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS21	St. Aubin Avenue	San MH 28	San Mh 27	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS22	St. Aubin Avenue	San Mh 27	San MH 26	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS23	St. Aubin Avenue	San MH 26	San MH 25	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS24	St. Aubin Avenue	San MH 25	San MH 1(old)	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS25	St. Aubin Avenue	San MH 1(old)	San MH 1	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS26	St. Aubin Avenue	San MH 19	San MH 18	100	250	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS27	St. Aubin Avenue	San MH 18	San MH 18A	100	250	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS28	St. Aubin Avenue	San MH 18A	San MH 10A	100	250	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS29	Cimon Street	San MH 10	San MH 10A	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS3	Hwy 11	San MH 7	San MH 6	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS4	Hwy 11	San MH 8	San MH 7	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS5	Hwy 11	San MH 9	San MH 8	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS6	Hwy 11	San MH 14	San MH 13	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS7	Hwy 11	San MH 13	San MH 12	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS8	Hwy 11 Easement	San MH 12	San MH 11	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS9	Leonard Avenue	San MH 17	San MH 16	100	200	1963	50	$147,486.54	2043	$105,208.50	-	100.00	-
SS31	Pelletier Avenue	San MH 33	San MH 32	100	200	1973	40	$147,486.54	2053	$105,208.50	100.00	-	-
SS32	Pelletier Avenue	San MH 32	San MH 31	100	200	1973	40	$147,486.54	2053	$105,208.50	100.00	-	-
SS33	Pelletier Avenue	San MH 31	San MH 30	100	200	1973	40	$147,486.54	2053	$105,208.50	100.00	-	-
SS34	Cimon Street	San MH 30	San MH 10A	100	200	1973	40	$147,486.54	2053	$105,208.50	100.00	-	-
SS35	St Joseph Street	San MH 32	San MH 34	100	200	1973	40	$147,486.54	2053	$105,208.50	100.00	-	-
SS36	Cimon Street	San MH 35	San MH 30	100	200	1979	34	$147,486.54	2059	$105,208.50	100.00	-	-
SS37	Rene Brunelle Ave	San MH 36	San MH 35	100	200	1979	34	$147,486.54	2059	$105,208.50	100.00	-	-
SS38	Rene Brunelle Ave	San MH 37	San MH 36	100	200	1979	34	$147,486.54	2059	$105,208.50	100.00	-	-
SS39	Rene Brunelle Ave	San MH 38	San MH 37	100	200	1979	34	$147,486.54	2059	$105,208.50	100.00	-	-
SS40	Remi Lake Road	San MH 1	San MH 2	100	200	1991	22	$147,486.54	2071	$105,208.50	100.00	-	-
SS41	Remi Lake Road	San MH 2	PS #1	100	300	1991	22	$147,486.54	2071	$105,208.50	100.00	-	-
SS30	Cimon Street	San MH 10A	PS #2	100	250	1996	17	$147,486.54	2076	$105,208.50	100.00	-	-
SS42	Remi Lake Road	San MH 2s	San MH 1s	100	200	1996	17	$147,486.54	2076	$105,208.50	100.00	-	-
SS43	Remi Lake Road	San MH 1s	San MH 2 (4)	100	200	1996	17	$147,486.54	2076	$105,208.50	100.00	-	-
SS44	Marco Avenue	San MH 3s	San MH 2s	100	200	1996	17	$147,486.54	2076	$105,208.50	100.00	-	-
SS45	Marco Avenue	Cap	San MH 3s	100	200	1996	17	$147,486.54	2076	$105,208.50	100.00	-	-

* All Sanitary Lengths are assumed 100m sections

4,500		$ 6,636,894	$ 4,734,383	1,600.00	2,900.00	-
			Percentage	36%	64%	

Summary of Asset Replacement & Cost by Year	
Total Replacement Cost 2043	$3,051,046.50
Total Replacement Cost 2053	$526,042.50
Total Replacement Cost 2059	$420,834.00
Total Replacement Cost 2071	$210,417.00
Total Replacement Cost 2076	$526,042.50

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Asset Management Planning
for the Township of Moonbeam

Appendix D
Infrastructure Profile
Bridges and Structures

TOWNSHIP OF MOONBEAM

BRIDGE ASSET SUMMARY

	General Bridge Information						Remaining Service Life (Years)			Condition (2013)		Associated Costs						
#	Structure Name	Superstructure / Deck Type	Substructure	Year Built	Rehab	Est. Age	Substructure	Superstructure	Deck	BCI	BSI	Historical Cost	Replacement Cost	Life Cycle Costs				
														Immediate	Within 1 Year	1-5 Years	6-10 Years	Total Costs
1	St Jean Road	Culvert	N/A	2008	-	5	N/A	45	N/A	85	84	N/A	$95,000.00	$0.00	$0.00	$0.00	$0.00	$0.00
													$95,000.00	$0.00	$0.00	$0.00	$0.00	$0.00

Bridge Condition Index (BCI)	
Good	100 - 70
Fair	70 - 60
Poor	< 60

NOTES:
Estimated date of instalation assumed 2008

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Asset Management Planning
for the Township of Moonbeam

Appendix E
Infrastructure Profile
Buildings and Facilities

Township Of Moonbeam
Building Asset Summary

	Building Name	General Building Information				Remaining Service Life				Facility Condition Index (FCI)	Associated Costs					
		Use	Year of Construction	Age (Yrs)	Size (ft²)	Structure	Mechanical	Electrical	Roof		Historical Cost	Replacement Cost	Life Cycle Costs			
													Immediate	0-5 Years	5-10 Years	Total
1	Mortuary - Cemetery	Municipal	1972	41	416	24	N/A	7	9	11.1%	$9,520.00	$54,400.00	$0.00	$0.00	$6,056.00	$6,056.00
2	Equipment Depot/Fire Hall - St Aubin Avenue	Fire	2010	3	7,320	71	34	21	28	0.0%	$462,590.00	$623,900.00	$0.00	$0.00	$0.00	$0.00
3	Storage Garage - Quonset - St Aubin Avenue	Municipal	1980	33	2,520	42	11	7	17	1.4%	$43,640.00	$141,000.00	$0.00	$0.00	$2,000.00	$2,000.00
4	Storage Building - St Aubin Avenue	Municipal	1980	33	924	27	8	5	17	9.4%	$19,715.00	$63,700.00	$0.00	$2,000.00	$4,000.00	$6,000.00
5	Pavillion - St Aubin Avenue	Municipal	1992	21	168	36	N/A	N/A	5	12.4%	$3,305.00	$5,800.00	$0.00	$717.36	$0.00	$717.36
6	Snack Bar/Washrooms	Tourism	1992	21	880	68	11	7	5	5.4%	$62,500.00	$106,300.00	$0.00	$3,757.60	$2,000.00	$5,757.60
7	Pavillion	Municipal	1992	21	100	36	N/A	N/A	5	32.9%	$912.00	$1,600.00	$0.00	$527.00	$0.00	$527.00
8	Water Treatment Plant	Water	1981	32	2,280	54	11	7	5	6.4%	$299,918.00	$1,257,100.00	$5,000.00	$44,380.00	$31,000.00	$80,380.00
9	Water Lift Station	Water	1981	32	384	35	11	7	9	2.0%	$63,205.00	$178,484.00	$0.00	$1,639.68	$2,000.00	$3,639.68
10	Municipal Office/Library - 53 St Aubin Avenue	Municipal	2010	3	2,720	71	34	21	28	0.0%	$358,329.00	$476,300.00	$0.00	$0.00	$0.00	$0.00
11	Comfort Station	Tourism	1992	21	100	36	N/A	N/A	5	7.1%	$3,419.00	$6,000.00	$0.00	$427.00	$0.00	$427.00
12	Sportsplex	Municipal	1984	29	9,000	58	1	7	26	1.2%	$163,510.00	$909,600.00	$0.00	$3,060.00	$8,000.00	$11,060.00
13	Outdoor Skating Rink	Municipal	1997	16	17,000	74	N/A	5	N/A	1.7%	$112,737.00	$115,000.00	$0.00	$2,000.00	$0.00	$2,000.00
14	Outdoor Skating Rink	Municipal	2010	3	17,000	60	N/A	20	N/A	0.0%	$112,737.00	$115,000.00	$0.00	$0.00	$0.00	$0.00
15	Historical House/Moonbeam Gallery - 93 St Aubin Avenue	Municipal	2006	7	1,777	66	29	16	23	0.0%	$25,000.00	$239,300.00	$0.00	$0.00	$0.00	$0.00
16	Tourism Information Building	Tourism	1992	21	600	36	NA	NA	68	0.0%	$146,446.00	$72,200.00	$0.00	$0.00	$0.00	$0.00
17	Tourism Information Shed	Tourism	2007	6	384	68	N/A	N/A	24	0.0%	$8,000.00	$26,600.00	$0.00	$0.00	$0.00	$0.00
18	Lagoon	Waste Water	1983	30	714,396	N/A	25	N/A	N/A	0.0%	N/A	$150,000.00	$0.00	$0.00	$0.00	$0.00
19	Chalet	Recreational	1968	45	2,100	6	6	7	9	6.5%	N/A	$243,500.00	$0.00	$0.00	$15,767.00	$15,767.00
20	First Aid Building	Recreational	1968	45	192	8	8	N/A	9	22.4%	N/A	$21,100.00	$0.00	$0.00	$4,719.00	$4,719.00
21	Tow Rope Building	Recreational	1968	45	300	9	N/A	7	9	22.0%	N/A	$28,500.00	$0.00	$0.00	$6,281.00	$6,281.00
22	Garage Ski Hill	Recreational	1968	45	672	10	N/A	7	9	11.0%	N/A	$44,300.00	$0.00	$0.00	$4,869.44	$4,869.44
23	Storage Shed Ski Hill	Recreational	1968	45	192	11	N/A	N/A	9	6.2%	N/A	$13,300.00	$0.00	$0.00	$819.44	$819.44
24	Wood Storage	Recreational	1968	45	120	13	N/A	N/A	9	21.3%	N/A	$2,400.00	$0.00	$0.00	$512.00	$512.00
												$4,895,384.00	$5,000.00	$58,508.64	$88,023.88	$151,532.52

Facility Condition Index (FCI)	
Good	< 5%
Fair	5% - 10 %
Poor	> 10%

NOTES:

Replacement cost of Lagoons based on size and projected historical costs for similar lagoons in the surrounding areas.

All other replacement costs based on Loss Control Inspection / Valuations Report by Jardine Llyod Thompson (2008).

No information was provided with regards to the Water and Sewer capital expenditures.
An assumed capital expenditure of $5000 per year is assumed for the mechanical systems for the Water Treatment Plant.
No capital expenditures were assumed for mechanical equipment at the Pump Stations or Lagoons.

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Asset Management Planning
for the Township of Moonbeam

Appendix F
Infrastructure Profile
Vehicles

Municipality Of Moonbeam
Asset Management Plan
Fleet

Assessment Year: **2013**

Asset Name	Purchase Year	Purchase Cost	Type	Age	Estimated Useful Life	Remaining Useful Life	Replacement Value	Replace Immediately	Replace within five years	Replace within 10 years
Chevrolet Van - 10	1978	$15,800	**Car - normal use**	35	9	-26	$ 35,000	$ 35,000	$ -	$ -
Tractor Ford Model 2000	1972	$5,766	**Backhoe - loader**	41	12	-29	$ 125,000	$ 125,000	$ -	$ -
Chevrolet Rescue Van - 30	1987	$65,000	**Fire equipment - light**	26	9	-17	$ 95,000	$ 95,000	$ -	$ -
Chevrolet Suburban K1500	1993	$34,344	**Car - normal use**	20	9	-11	$ 35,000	$ 35,000	$ -	$ -
John Deer Loader 544E	1989	$91,557	**Backhoe - loader**	24	12	-12	$ 125,000	$ 125,000	$ -	$ -
Ford 900 Pumper	1975	$53,045	**Fire equipment - heavy**	38	20	-18	$ 250,000	$ 250,000	$ -	$ -
Western Star Tandem Truck	1982	$290,000	**Heavy truck**	31	20	-11	$ 250,000	$ 250,000	$ -	$ -
International S2500 Tanker	1986	$105,500	**Fire equipment - heavy**	27	20	-7	$ 250,000	$ 250,000	$ -	$ -
Champion 740 Grader	1997	$209,185	**Grader**	16	13	-3	$ 350,000	$ 350,000	$ -	$ -
International Garbage Truck	1995	$99,170	**Heavy truck**	18	20	2	$ 250,000	$ -	$ 250,000	$ -
GMC Pickup 4x4	2003	$37,493	**Pick-up truck**	10	20	10	$ 40,000	$ -	$ -	$ 40,000
Gator	2004	$7,287	**Off-road equipment**	9	25	16	$ 15,000	$ -	$ -	$ -
John Deere Tractor/Loader/Broom	2009	$45,200	**Backhoe - loader**	4	12	8	$ 50,000	$ -	$ -	$ 50,000
Tractor	2010	$7,558	**Backhoe - loader**	3	12	9	$ 15,000	$ -	$ -	$ 15,000
Chevrolet Pickup 4x4	2008	$33,661	**Pick-up truck**	5	20	15	$ 40,000	$ -	$ -	$ -
Western Star Tandem Plow	2008	$123,822	**Plow**	5	20	15	$ 250,000	$ -	$ -	$ -
2009 Tanker	2009	$336,207	**Fire equipment - heavy**	4	20	16	$ 250,000	$ -	$ -	$ -
Double Axle Trailer	2009	$2,254	**Trailer**	4	25	21	$ 5,000	$ -	$ -	$ -
Woodgreen Trailer	2010	$15,480	**Trailer**	3	25	22	$ 20,000	$ -	$ -	$ -
						Total	$ 2,450,000	$ 1,515,000	$ 250,000	$ 105,000

KPMG
cutting through complexity

exp.

Asset Management Planning
for the Township of Moonbeam

Appendix G
Life Cycle Profiles for Linear Infrastructure

MUNICIPAL ROADS - LIFECYCLE COSTING

URBAN ROADS

PAVED URBAN COLLECTOR (10.0m Lane)

Service Year	5th Year	10th Year	15th Year	20th Year	25th Year	30th Year	35th Year	40th Year	45th Year	50th Year	55th Year	60th Year	
Operational Items	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Rehabilitation	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Reconstruction	**TOTAL LIFECYCLE COST**
Operation Cost / km	$15,000	$15,000	$356,046	$15,000	$15,000	$1,802,920	$15,000	$15,000	$356,046	$15,000	$15,000	$2,189,923	**$4,824,936**

Asset Operational Item	Cost / m	Cost / km
Crack Sealing	$15.00	$15,000.00
Resurfacing	$356.05	$356,046.48
Rehabilitation	$1,802.92	$1,802,919.85
Reconstruction	$2,189.92	$2,189,923.36

Road Structure
300mm Granular B
150mm Granular A
50mm HL8
40mm HL3

PAVED URBAN ARTERIAL (11.0m Lane)

Service Year	5th Year	10th Year	15th Year	20th Year	25th Year	30th Year	35th Year	40th Year	45th Year	50th Year	55th Year	60th Year	
Operational Items	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Rehabilitation	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Reconstruction	**TOTAL LIFECYCLE COST**
Operation Cost / km	$25,000	$25,000	$653,869	$25,000	$25,000	$2,508,572	$25,000	$25,000	$653,869	$25,000	$25,000	$3,046,435	**$7,062,745**

Asset Operational Item	Cost / m	Cost / km
Crack Sealing	$25.00	$25,000.00
Resurfacing	$653.87	$653,869.24
Rehabilitation	$2,508.57	$2,508,572.09
Reconstruction	$3,046.43	$3,046,434.51

Road Structure
450mm Granular B
150mm Granular A
2 x 50mm HL8
40mm HL3

MUNICIPAL ROADS - LIFECYCLE COSTING

RURAL ROADS

GRANULAR RURAL (6.5m Lane)

Service Year	13th Year	25th Year	38th Year	50th Year	63th Year	75th Year	
Operational Items	Granular Top Up	Resurfacing	Granular Top Up	Rehabilitation	Granular Top Up	Reconstruction	
	Ditching	Ditching	Ditching	Ditching	Ditching	Ditching	
	Brushing	Brushing	Brushing	Brushing	Brushing	Brushing	**TOTAL LIFECYCLE COST**
Operation Cost / km	$74,000	$175,289	$74,000	$670,473	$74,000	$847,503	**$1,915,265**

Asset Operational Item	Cost / m	Cost / km
100mm Granular Top Up	$45.00	$45,000.00
Ditching	$11.50	$11,500.00
Brushing	$17.50	$17,500.00
Resurfacing	$175.29	$175,289.00
Rehabilitation	$670.47	$670,473.00
Reconstruction	$847.50	$847,503.00

Road Structure
300mm Granular B
150mm Granular A

SURFACE TREATED RURAL MINOR (6.5m Lane)

Service Year	3rd Year	10th Year	13th Year	20th Year	23th Year	30th Year	
Operational Items	2nd Application	Resurfacing	2nd Application	Rehabilitation	2nd Application	Reconstruction	**TOTAL LIFECYCLE COST**
Operation Cost / km	$52,500	$470,445	$52,500	$753,585	$52,500	$996,141	**$2,377,670**

Asset Operational Item	Cost / m	Cost / km
2nd Application of Surface	$52.50	$52,500.00
Ditching	$11.50	$11,500.00
Brushing	$17.50	$17,500.00
Resurfacing	$470.45	$470,445.25
Rehabilitation	$753.58	$753,584.50
Reconstruction	$996.14	$996,140.50

Road Structure
300mm Granular B
150mm Granular A
25mm First Surface Treatement
25mm Second Surface Treatment

PAVED RURAL COLLECTOR (7.0m Lane)

Service Year	5th Year	10th Year	15th Year	20th Year	25th Year	30th Year	35th Year	40th Year	45th Year	50th Year	55th Year	60th Year	
Operational Items	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Rehabilitation	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Reconstruction	
		Ditching		Ditching				Ditching		Dithcing			**TOTAL LIFECYCLE COST**
Operation Cost / km	$25,000	$36,500	$415,245	$36,500	$25,000	$1,195,847	$25,000	$36,500	$415,245	$36,500	$25,000	$1,459,023	**$3,731,360**

Asset Operational Item	Cost / m	Cost / km
Crack Sealing	$25.00	$25,000.00
Ditching	$11.50	$11,500.00
Resurfacing	$415.25	$415,245.00
Rehabilitation	$1,195.85	$1,195,847.00
Reconstruction	$1,459.02	$1,459,023.00

Road Structure
300mm Granular B
150mm Granular A
50mm HL8
40mm HL3

PAVED RURAL ARTERIAL (7.5m Lane)

Service Year	5th Year	10th Year	15th Year	20th Year	25th Year	30th Year	35th Year	40th Year	45th Year	50th Year	55th Year	60th Year	
Operational Items	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Rehabilitation	Crack Sealing	Crack Sealing	Resurfacing	Crack Sealing	Crack Sealing	Reconstruction	
		Ditching		Ditching				Ditching		Dithcing			**TOTAL LIFECYCLE COST**
Operation Cost / km	$30,000	$41,500	$555,575	$41,500	$30,000	$1,507,090	$30,000	$41,500	$555,575	$41,500	$30,000	$1,933,493	**$4,837,733**

Asset Operational Item	Cost / m	Cost / km
Crack Sealing	$30.00	$30,000.00
Ditching	$11.50	$11,500.00
Resurfacing	$555.58	$555,575.00
Rehabilitation	$1,507.09	$1,507,089.50
Reconstruction	$1,933.49	$1,933,493.00

Road Structure
450mm Granular B
150mm Granular A
2 x 50mm HL8
40mm HL3

STORM SEWER LIFECYCLE COSTING

URBAN STORM SEWER

URBAN COLLECTION SEWER (300 - 900mm ø)

Service Year	20th Year	35th Year	50th Year	65th Year	80th Year	
Operational Items	Cleaning/Flushing	Camera Inspections Cleaning/Flushing Structure Inspections	60% Appurtenance Replacement	Camera Inspections Cleaning/Flushing Structure Inspections	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / k	$35,000	$56,000	$135,538	$56,000	$943,890	**$1,226,428**

Asset Operational	Cost / m	Cost / km	Notes
Camera Inspection	$15.00	$15,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$35.00	$35,000.00	
Appurtenance Replac	$225.90	$225,896.00	
Complete Replaceme	$943.89	$943,890.00	

URBAN TRUNK SEWER (900 - 1500mm ø)

Service Year	20th Year	35th Year	50th Year	65th Year	80th Year	
Operational Items	Cleaning/Flushing	Camera Inspections Structure Inspections Cleaning/Flushing	60% Appurtenance Replacement	Camera Inspections Structure Inspections Cleaning/Flushing	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / k	$35,000	$56,000	$189,536	$56,000	$1,562,685	**$1,899,221**

Asset Operational	Cost / m	Cost / km	Notes
Camera Inspection	$15.00	$15,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$35.00	$35,000.00	
Appurtenance Replac	$315.89	$315,894.00	
Complete Replaceme	$1,562.69	$1,562,685.00	

URBAN LARGE TRUNK SEWER (1500mm ø - 3.0 x 3.0m Box Culvert)

Service Year	20th Year	35th Year	50th Year	65th Year	80th Year	
Operational Items	Cleaning/Flushing	Camera Inspections Structure Inspections Cleaning/Flushing	60% Appurtenance Replacement	Camera Inspections Structure Inspections Cleaning/Flushing	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / k	$35,000	$56,000	$362,071	$56,000	$3,759,880	**$4,268,951**

Asset Operational	Cost / m	Cost / km	Notes
Camera Inspection	$15.00	$15,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$35.00	$35,000.00	
Appurtenance Replac	$603.45	$603,452.00	
Complete Replaceme	$3,759.88	$3,759,880.00	

RURAL STORM SEWER

RURAL COLLECTION SEWER (300 - 900mm ø)

Service Year	20th Year	35th Year	50th Year	65th Year	80th Year	
Operational Items	Cleaning/Flushing	Camera Inspections Structure Inspections Cleaning/Flushing	60% Appurtenance Replacement	Camera Inspections Structure Inspections Cleaning/Flushing	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / k	$35,000	$56,000	$154,796	$56,000	$903,185	**$1,204,981**

Asset Operational	Cost / m	Cost / km	Notes
Camera Inspection	$15.00	$15,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$35.00	$35,000.00	
Appurtenance Replac	$257.99	$257,994.00	
Complete Replaceme	$903.19	$903,185.00	

RURAL TRUNK SEWER (900 - 1500mm ø)

Service Year	20th Year	35th Year	50th Year	65th Year	80th Year	
Operational Items	Cleaning/Flushing	Camera Inspections Structure Inspections Cleaning/Flushing	60% Appurtenance Replacement	Camera Inspections Structure Inspections Cleaning/Flushing	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / k	$35,000	$56,000	$209,131	$56,000	$1,581,480	**$1,937,611**

Asset Operational	Cost / m	Cost / km	Notes
Camera Inspection	$15.00	$15,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$35.00	$35,000.00	
Appurtenance Replac	$348.55	$348,552.00	
Complete Replaceme	$1,581.48	$1,581,480.00	

SANITARY SEWER LIFECYCLE COSTING

SANITARY SEWER

SANITARY COLLECTION SEWER (150 - 300mm ø)

Service Year	20th Year	40th Year	50th Year	60th Year	80th Year	
Operational Items	Camera Cleaning/Flushing Structure Inspection	Camera Inspections Cleaning/Flushing Structure Inspections	60% Structure Replacement	Camera Inspections Cleaning/Flushing Structure Inspections	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$86,000	$86,000	$164,780	$86,000	$1,052,085	**$1,474,865**

Asset Operational Ite	Cost / m	Cost / km	Notes
Camera Inspection	$25.00	$25,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$55.00	$55,000.00	
Structure Replacement	$274.63	$274,634.00	
Complete Replacement	$1,052.09	$1,052,085.00	

SANITARY COLLECTION SEWER (300-450mm ø)

Service Year	20th Year	40th Year	50th Year	60th Year	80th Year	
Operational Items	Camera Cleaning/Flushing Structure Inspection	Camera Inspections Cleaning/Flushing Structure Inspections	60% Structure Replacement	Camera Inspections Cleaning/Flushing Structure Inspections	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$86,000	$86,000	$173,780	$86,000	$1,127,085	**$1,558,865**

Asset Operational Ite	Cost / m	Cost / km	Notes
Camera Inspection	$25.00	$25,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$55.00	$55,000.00	
Structure Replacement	$289.63	$289,634.00	
Complete Replacement	$1,127.09	$1,127,085.00	

SANITARY TRUNK SEWER (500-750mm ø)

Service Year	20th Year	40th Year	50th Year	60th Year	80th Year	
Operational Items	Camera Cleaning/Flushing Structure Inspection	Camera Inspections Cleaning/Flushing Structure Inspections	60% Structure Replacement	Camera Inspections Cleaning/Flushing Structure Inspections	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$126,000	$126,000	$248,851	$126,000	$1,908,412	**$2,535,263**

Asset Operational Ite	Cost / m	Cost / km	Notes
Camera Inspection	$35.00	$35,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$85.00	$85,000.00	
Structure Replacement	$414.75	$414,752.00	
Complete Replacement	$1,908.41	$1,908,412.00	

Forcemain (200mm ø)

Service Year	20th Year	40th Year	50th Year	60th Year	80th Year	
Operational Items	Camera Cleaning/Flushing Structure Inspection	Camera Inspections Cleaning/Flushing Structure Inspections	60% Structure Replacement	Camera Inspections Cleaning/Flushing Structure Inspections	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$86,000	$86,000	$0	$86,000	$0	**$258,000**

Asset Operational Ite	Cost / m	Cost / km	Notes
Camera Inspection	$25.00	$25,000.00	
Structure Inspection	$6.00	$6,000.00	
Cleaning / Flushing	$55.00	$55,000.00	
Structure Replacement	$0.00	$0.00	
Complete Replacement	$0.00	$0.00	

WATER SUPPLY LIFECYCLE COSTING

URBAN DISTRIBUTION WATERMAINS

URBAN DISTRIBUTION (100mm ø PVC)

Service Year	**20th Year**	**40th Year**	**60th Year**	**80th Year**	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$128,182	$55,000	$631,110	**$869,292**

Asset Operational Item	**Cost / m**	**Cost / km**	**Notes**
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$113.18	$113,182.00	
Complete Main Replacement	$631.11	$631,110.00	

URBAN DISTRIBUTION (150mm ø PVC)

Service Year	**20th Year**	**40th Year**	**60th Year**	**80th Year**	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$128,182	$55,000	$671,110	**$909,292**

Asset Operational Item	**Cost / m**	**Cost / km**	**Notes**
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$113.18	$113,182.00	
Complete Main Replacement	$671.11	$671,110.00	

URBAN DISTRIBUTION (200mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$142,682	$55,000	$748,610	$1,001,292

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$127.68	$127,682.00	
Complete Main Replacement	$748.61	$748,610.00	

URBAN DISTRIBUTION (250mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$147,182	$55,000	$817,110	$1,074,292

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$132.18	$132,182.00	
Complete Main Replacement	$817.11	$817,110.00	

URBAN DISTRIBUTION (300mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$157,182	$55,000	$953,910	$1,221,092

Asset Operational Item	Cost / m	Cost / km	Notes

Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$142.18	$142,182.00	
Complete Main Replacement	$953.91	$953,910.00	

URBAN DISTRIBUTION (325mm ø PVC)

Service Year	**20th Year**	**40th Year**	**60th Year**	**80th Year**	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$161,182	$55,000	$977,410	**$1,248,592**

Asset Operational Item	**Cost / m**	**Cost / km**	**Notes**
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$146.18	$146,182.00	
Complete Main Replacement	$977.41	$977,410.00	

URBAN DISTRIBUTION (375mm ø PVC)

Service Year	**20th Year**	**40th Year**	**60th Year**	**80th Year**	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$168,182	$55,000	$1,022,910	**$1,301,092**

Asset Operational Item	**Cost / m**	**Cost / km**	**Notes**
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$153.18	$153,182.00	
Complete Main Replacement	$1,022.91	$1,022,910.00	

URBAN DISTRIBUTION (450mm ø PVC)

Service Year	**20th Year**	**40th Year**	**60th Year**	**80th Year**	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$75,000	$199,182	$75,000	$1,091,910	**$1,441,092**

Asset Operational Item	**Cost / m**	**Cost / km**	**Notes**
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$35.00	$35,000.00	
Appurtenance Replacement	$164.18	$164,182.00	

Complete Main Replacement	$1,091.91	$1,091,910.00

RURAL DISTRIBUTION WATERMAINS

RURAL DISTRIBUTION (150mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$91,682	$55,000	$506,860	$708,542

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$76.68	$76,682.00	
Complete Main Replacement	$506.86	$506,860.00	

RURAL DISTRIBUTION (200mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$104,432	$55,000	$582,940	$797,372

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$89.43	$89,432.00	
Complete Main Replacement	$582.94	$582,940.00	

RURAL DISTRIBUTION (250mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	TOTAL LIFECYCLE COST
Operation Cost / km	$55,000	$108,182	$55,000	$650,020	$868,202

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	

Appurtenance Replacement	$93.18	$93,182.00
Complete Main Replacement	$650.02	$650,020.00

RURAL DISTRIBUTION (300mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$75,000	$167,937	$75,000	$873,085	**$1,191,022**

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$35.00	$35,000.00	
Appurtenance Replacement	$132.94	$132,937.00	
Complete Main Replacement	$873.09	$873,085.00	

RURAL DISTRIBUTION (325mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$144,437	$55,000	$900,245	**$1,154,682**

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$129.44	$129,437.00	
Complete Main Replacement	$900.25	$900,245.00	

RURAL DISTRIBUTION (375mm ø PVC)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$55,000	$149,437	$55,000	$968,575	**$1,228,012**

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$2.00	$2,000.00	Annually
Swabbing/Chlorination	$15.00	$15,000.00	
Appurtenance Replacement	$134.44	$134,437.00	
Complete Main Replacement	$968.58	$968,575.00	

TRANSMISSION WATERMAINS

TRANSMISSION (450mm ø Pressure Pipe)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$145,000	$308,564	$145,000	$1,050,910	**$1,649,474**

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$4.00	$4,000.00	Annually
Swabbing/Chlorination	$65.00	$65,000.00	
Appurtenance Replacement	$243.56	$243,564.00	
Complete Main Replacement	$1,050.91	$1,050,910.00	

TRANSMISSION (600mm ø Pressure Pipe)

Service Year	20th Year	40th Year	60th Year	80th Year	
Operational Items	Valve Exercise Swabbing / Chlorination	Appurtenance Replacement Swabbing	Valve Exercise Swabbing / Chlorination	Complete Replacement	**TOTAL LIFECYCLE COST**
Operation Cost / km	$235,000	$414,874	$235,000	$1,460,685	**$2,345,559**

Asset Operational Item	Cost / m	Cost / km	Notes
Valve Exercise	$6.00	$6,000.00	Annually
Swabbing/Chlorination	$115.00	$115,000.00	
Appurtenance Replacement	$299.87	$299,874.00	
Complete Main Replacement	$1,460.69	$1,460,685.00	

KPMG
cutting through complexity

exp.

Asset Management Planning
for the Township of Moonbeam

Appendix H
Costing Estimates for Life Cycle Activities

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

User Data Input Cells
End of Sheet Section

ROAD CONSTRUCTION UNIT RATES

Item	$ / tonne	$ / m^3	Conv.	Notes
Excavation & Disposal	$18.92	$35.00	1.85	Haul length, and unit conversion should be considered
Earth Cut	$5.41	$10.00	1.85	Haul length, and unit conversion should be considered
Digouts		$65.00		Includes replacement granulars
Rock Excavation		$75.00	2.70	Haul length, and unit conversion should be considered
Imported Earth Fill	$17.95	$35.00	1.95	Haul length, and unit conversion should be considered
Engineered Fill	$25.00	$50.00	2.10	Haul length, engineering requirements for fill and unit conversion should be considered
Granular C	$12.00	$24.00	2.00	Haul Length should be considered
Granular B	$14.00	$28.00	2.00	Haul Length should be considered
Granular B Type II	$16.50	$36.30	2.20	Haul Length should be considered
Granular A	$18.50	$44.40	2.40	Haul Length should be considered
HL3 Asphalt	$170.00	$416.50	2.45	Haul Length should be considered
HL4 Asphalt	$165.00	$404.25	2.45	Haul Length should be considered
HL8 Asphalt	$150.00	$367.50	2.45	Haul Length should be considered

	$ / m^2	Notes
Single Surface Treatement	$8.50	Availability, haul length should be considered
Double Surface Treatment	$17.00	Availability, haul length should be considered
Pulverize	$2.25	
Mill Wear Surface	$3.50	
Prep Surface for Asphalt	$1.25	

	$ / m	Notes
Curb & Gutter	$145.00	
Sidewalk	$125.00	
Brushing	$17.50	
Ditching	$11.50	
Crack Sealing	$15.00	

General Notes

Contract size should always be considered, the rates notes above are an average of many executed project tenders

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

RURAL SECTIONS

RURAL - RECONSTRUCTION

Type/Description	Length (m)	Width (m)	Depth (m)	Area (m^2)	Volume (m^3)	Unit Rate	Cost / lane km	Cost / lane m
Granular - 3.25m lane								
450mm Excavation & Disposal	1,000	4.650	0.45		2092.5	$35.00	$73,238	$73.24
300mm Granular B	1,000	4.350	0.3		1305	$28.00	$36,540	$36.54
150mm Granular A	1,000	3.900	0.15		585	$44.40	$25,974	$25.97
Digouts	150	5.000	1		750	$65.00	$48,750	$48.75
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$10,000	$10.00
					Total (3.25m lane)		**$277,502**	**$277.50**
					Total (6.50m road)		**$555,003**	**$555.00**
Rural Light SST - 3.25m lane								
475mm Excavation & Disposal	1,000	4.650	0.475		2208.75	$35.00	$77,306	$77.31
300mm Granular B	1,000	4.350	0.3		1305	$28.00	$36,540	$36.54
150mm Granular A	1,000	3.900	0.15		585	$44.40	$25,974	$25.97
Single Surface Treatment	1,000	3.250		3250		$8.50	$27,625	$27.63
Digouts	150	5.000	1		750	$65.00	$48,750	$48.75
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$25,000	$25.00
					Total (3.25m lane)		**$324,195**	**$324.20**
					Total (6.50m road)		**$648,391**	**$648.39**
Rural Light DST - 3.25m lane								
475mm Excavation & Disposal	1,000	4.650	0.475		2208.75	$35.00	$77,306	$77.31
300mm Granular B	1,000	4.350	0.3	4350	1305	$28.00	$36,540	$36.54
150mm Granular A	1,000	3.900	0.15	3900	585	$44.40	$25,974	$25.97
Double Surface Treatment	1,000	3.250		3250		$17.00	$55,250	$55.25
Digouts	150	5.000	1		750	$65.00	$48,750	$48.75
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$25,000	$25.00
					Total (3.25m lane)		**$351,820**	**$351.82**

ROAD CONSTRUCTION COSTING

ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

					Total (6.50m road)		**$703,641**	**$703.64**
Rural Light Paved - 3.25m lane								
500mm Excavation & Disposal	1,000	4.650	0.455		2115.75	$35.00	$74,051	$74.05
300mm Granular B	1,000	4.350	0.3	4350	1305	$28.00	$36,540	$36.54
150mm Granular A	1,000	3.900	0.15	3900	585	$44.40	$25,974	$25.97
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72
Digouts	150	5.000	1		750	$65.00	$48,750	$48.75
Drainage / Culverts							$45,000	$45.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$35,000	$35.00
					Total (3.25m lane)		**$383,034**	**$383.03**
					Total (6.50m road)		**$766,068**	**$766.07**
Rural Medium Paved - 3.5m lane (Collector)								
540mm Excavation & Disposal	1,000	4.900	0.54		2646	$35.00	$92,610	$92.61
300mm Granular B	1,000	4.600	0.3	4600	1380	$28.00	$38,640	$38.64
150mm Granular A	1,000	4.150	0.15	4150	622.5	$44.40	$27,639	$27.64
50mm HL8	1,000	3.500	0.05	3500	175	$367.50	$64,313	$64.31
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Digouts	150	6.000	1		900	$65.00	$58,500	$58.50
Drainage / Culverts							$150,000	$150.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$45,000	$45.00
					Total (3.50m lane)		**$593,012**	**$593.01**
					Total (7.0m road)		**$1,186,023**	**$1,186.02**
Rural Heavy Paved - 3.75m lane (Arterial)								
740mm Excavation & Disposal	1,000	5.450	0.74		4033	$35.00	$141,155	$141.16
450mm Granular B	1,000	5.000	0.45	5000	2250	$28.00	$63,000	$63.00
150mm Granular A	1,000	4.400	0.15	4400	660	$44.40	$29,304	$29.30
50mm HL8	1,000	3.750	0.05	3750	187.5	$367.50	$68,906	$68.91
50mm HL8	1,000	3.750	0.05	3750	187.5	$367.50	$68,906	$68.91
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Digouts	150	6.000	1		900	$65.00	$58,500	$58.50
Drainage / Culverts							$225,000	$225.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$55,000	$55.00
					Total (3.75m lane)		**$830,247**	**$830.25**
					Total (7.5m road)		**$1,660,493**	**$1,660.49**

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

RURAL - REHABILITATION								
Type/Description	**Length (m)**	**Width (m)**	**Depth (m)**	**Area (m^2)**	**Volume (m^3)**	**Unit Rate**	**Cost / lane km**	**Cost / lane m**
Granular - 3.25m lane								
150mm Excavation & Disposal	1,000	4.050	0.15		607.5	$35.00	$21,263	$21.26
150mm Granular A	1,000	3.900	0.15	3900	585	$44.40	$25,974	$25.97
Digouts	50	5.000	1		250	$65.00	$16,250	$16.25
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$10,000	$10.00
					Total (3.25m lane)		**$156,487**	**$156.49**
					Total (6.50m road)		**$312,973**	**$312.97**
Rural Light SST - 3.25m lane								
75mm Excavation & Disposal	1,000	3.850	0.075		288.75	$35.00	$10,106	$10.11
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
Single Surface Treatment	1,000	3.250		3250		$8.50	$27,625	$27.63
Digouts	50	5.000	1		250	$65.00	$16,250	$16.25
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$25,000	$25.00
					Total (3.25m lane)		**$170,417**	**$170.42**
					Total (6.50m road)		**$340,835**	**$340.83**
Rural Light DST - 3.25m lane								
75mm Excavation & Disposal	1,000	3.850	0.075		288.75	$35.00	$10,106	$10.11
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
Double Surface Treatment	1,000	3.250		3250		$17.00	$55,250	$55.25
Digouts	50	5.000	1		250	$65.00	$16,250	$16.25
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$25,000	$25.00
					Total (3.25m lane)		**$198,042**	**$198.04**
					Total (6.50m road)		**$396,085**	**$396.08**
Rural Light Paved - 3.25m lane								
100mm Excavation & Disposal	1,000	3.850	0.1		385	$35.00	$13,475	$13.48
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72

ROAD CONSTRUCTION COSTING

ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

Digouts	50	5.000	1		250	$65.00	$16,250	$16.25
Drainage / Culverts							$45,000	$45.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$35,000	$35.00
					Total (3.25m lane)		**$235,880**	**$235.88**
					Total (6.50m road)		**$471,760**	**$471.76**
Rural Medium Paved - 3.5m lane (Collector)								
140mm Excavation & Disposal	1,000	3.850	0.14		539	$35.00	$18,865	$18.87
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
50mm HL8	1,000	3.500	0.05	3500	175	$367.50	$64,313	$64.31
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Digouts	50	6.000	1		300	$65.00	$19,500	$19.50
Drainage / Culverts							$150,000	$150.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$45,000	$45.00
					Total (3.50m lane)		**$422,424**	**$422.42**
					Total (7.0m road)		**$844,847**	**$844.85**
Rural Heavy Paved - 3.75m lane (Arterial)								
190mm Excavation & Disposal	1,000	3.850	0.19		731.5	$35.00	$25,603	$25.60
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
50mm HL8	1,000	3.750	0.05	3750	187.5	$367.50	$68,906	$68.91
50mm HL8	1,000	3.750	0.04	3750	150	$367.50	$55,125	$55.13
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Digouts	50	6.000	1		300	$65.00	$19,500	$19.50
Drainage / Culverts							$225,000	$225.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$55,000	$55.00
					Total (3.75m lane)		**$578,045**	**$578.04**
					Total (7.5m road)		**$1,156,090**	**$1,156.09**

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

RURAL - RESURFACING								
Type/Description	**Length (m)**	**Width (m)**	**Depth (m)**	**Area (m^2)**	**Volume (m^3)**	**Unit Rate**	**Cost / lane km**	**Cost / lane m**
Granular - 3.25m lane								
150mm Granular A	1,000	3.325	0.15	3325	498.75	$44.40	$22,145	$22.14
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$7,500	$7.50
					Total (3.25m lane)		**$87,645**	**$87.64**
					Total (6.50m road)		**$175,289**	**$175.29**
Rural Light SST - 3.25m lane								
Pulverize Existing	1,000	3.250		3250		$2.25	$7,313	$7.31
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
Single Surface Treatment	1,000	3.250		3250		$8.50	$27,625	$27.63
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$15,000	$15.00
					Total (3.25m lane)		**$137,000**	**$137.00**
					Total (6.50m road)		**$274,000**	**$274.00**
Rural Light DST - 3.25m lane								
Pulverize Existing	1,000	3.250		3250		$2.25	$7,313	$7.31
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
Double Surface Treatment	1,000	3.250		3250		$17.00	$55,250	$55.25
Drainage / Culverts							$25,000	$25.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$15,000	$15.00
					Total (3.25m lane)		**$164,625**	**$164.63**
					Total (6.50m road)		**$329,250**	**$329.25**
Rural Light Paved - 3.25m lane								
Pulverize Existing	1,000	3.250		3250		$2.25	$7,313	$7.31
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72
Drainage / Culverts							$35,000	$35.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$15,000	$15.00
					Total (3.25m lane)		**$179,094**	**$179.09**

ROAD CONSTRUCTION COSTING

ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

					Total (6.50m road)		**$358,188**	**$358.19**
Rural Medium Paved - 3.5m lane (Collector)								
Mill Wear Surface	1,000	3.500		3500		$3.50	$12,250	$12.25
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Drainage / Culverts							$50,000	$50.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$25,000	$25.00
					Total (3.50m lane)		**$207,623**	**$207.62**
					Total (7.0m road)		**$415,245**	**$415.25**
Rural Heavy Paved - 3.75m lane (Arterial)								
Mill Wear Surface	1,000	3.750		3750		$3.50	$13,125	$13.13
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
50mm HL8	1,000	3.750	0.04	3750	150	$367.50	$55,125	$55.13
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Drainage / Culverts							$50,000	$50.00
Brushing	2,000					$17.50	$35,000	$35.00
Ditching	2,000					$11.50	$23,000	$23.00
Contingency for Minor Contract Items							$35,000	$35.00
					Total (3.75m lane)		**$277,788**	**$277.79**
					Total (7.5m road)		**$555,575**	**$555.58**

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

URBAN SECTIONS

URBAN - RECONSTRUCTION

Type/Description	Length (m)	Width (m)	Depth (m)	Area (m2)	Volume (m3)	Unit Rate	Cost / lane km	Cost / lane m
Urban Light Paved - 3.25m lane								
500mmExcavation & Disposal	1,000	4.650	0.5		2325	$35.00	$81,375	$81.38
300mm Granular B	1,000	4.350	0.3	4350	1305	$28.00	$36,540	$36.54
150mm Granular A	1,000	3.900	0.15	3900	585	$44.40	$25,974	$25.97
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (one side)	1,000					$125.00	$125,000	$125.00
Contingency for Minor Contract Items							$45,000	$45.00
					Total (3.25m lane)		**$663,608**	**$663.61**
					Total (6.50m road)		**$1,327,216**	**$1,327.22**
Urban Medium Paved - 3.50m lane (Collector)								
540mm Excavation & Disposal	1,000	4.900	0.54		2646	$35.00	$92,610	$92.61
300mm Granular B	1,000	4.600	0.3	4600	1380	$28.00	$38,640	$38.64
150mm Granular A	1,000	4.150	0.15	4150	622.5	$44.40	$27,639	$27.64
50mm HL8	1,000	3.500	0.05	3500	175	$367.50	$64,313	$64.31
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (one side)	1,000					$125.00	$125,000	$125.00
Contingency for Minor Contract Items							$70,000	$70.00
					Total (3.50m lane)		**$766,512**	**$766.51**
					Total (7.0m road)		**$1,533,023**	**$1,533.02**
					Total (10.0m road)		**$2,189,923**	**$2,189.92**
Urban Heavy Paved - 3.75m lane (Arterial)								
740mm Excavation & Disposal	1,000	5.200	0.74		3848	$35.00	$134,680	$134.68
450mm Granular B	1,000	4.750	0.45	4750	2137.5	$28.00	$59,850	$59.85
150mm Granular A	1,000	4.150	0.15	4150	622.5	$44.40	$27,639	$27.64
50mm HL8	1,000	3.750	0.05	3750	187.5	$367.50	$68,906	$68.91
50mm HL8	1,000	3.750	0.04	3750	150	$367.50	$55,125	$55.13
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (both sides)	2,000					$125.00	$250,000	$250.00
Contingency for Minor Contract Items							$90,000	$90.00
					Total (3.75m lane)		**$1,038,675**	**$1,038.68**
					Total (7.5m road)		**$2,077,351**	**$2,077.35**

ROAD CONSTRUCTION COSTING

ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

						Total (11.0m road)	**$3,046,435**	**$3,046.43**

URBAN - REHABILITATION

Type/Description	Length (m)	Width (m)	Depth (m)	Area (m2)	Volume (m3)	Unit Rate	Cost / lane km	Cost / lane m
Urban Light Paved - 3.25m lane								
155mm Excavation & Disposal	1,000	3.850	0.155		596.75	$35.00	$20,886	$20.89
50mm Granular A	1,000	3.800	0.05	3800	190	$44.40	$8,436	$8.44
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (one side)	1,000					$125.00	$125,000	$125.00
Contingency for Minor Contract Items							$50,000	$50.00
						Total (3.25m lane)	**$554,041**	**$554.04**
						Total (6.50m road)	**$1,108,082**	**$1,108.08**
Urban Medium Paved - 3.50m lane (Collector)								
240mm Excavation & Disposal	1,000	4.100	0.24		984	$35.00	$34,440	$34.44
50mm Granular A	1,000	4.050	0.05	4050	202.5	$44.40	$8,991	$8.99
50mm HL8	1,000	3.500	0.05	3500	175	$367.50	$64,313	$64.31
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (one side)	1,000					$125.00	$125,000	$125.00
Contingency for Minor Contract Items							$50,000	$50.00
						Total (3.50m lane)	**$631,054**	**$631.05**
						Total (7.0m road)	**$1,262,107**	**$1,262.11**
						Total (10.0m road)	**$1,802,920**	**$1,802.92**
Urban Heavy Paved - 3.75m lane (Arterial)								
290mm Excavation & Disposal	1,000	4.350	0.29	4350	1261.5	$35.00	$44,153	$44.15
50mm Granular A	1,000	4.300	0.05	4300	215	$44.40	$9,546	$9.55
50mm HL8	1,000	3.750	0.05	3750	187.5	$367.50	$68,906	$68.91
50mm HL8	1,000	3.750	0.04	3750	150	$367.50	$55,125	$55.13
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Curb & Gutter	2,000					$145.00	$290,000	$290.00
Sidewalk (both sides)	2,000					$125.00	$250,000	$250.00
Contingency for Minor Contract Items							$75,000	$75.00
						Total (3.75m lane)	**$855,205**	**$855.20**
						Total (7.5m road)	**$1,710,410**	**$1,710.41**
						Total (11.0m road)	**$2,508,572**	**$2,508.57**

ROAD CONSTRUCTION COSTING
ROAD RECONSTRUCTION, REHABILITATION & RESURFACING COSTING

URBAN - RESURFACING								
Type/Description	**Length (m)**	**Width (m)**	**Depth (m)**	**Area (m^2)**	**Volume (m^3)**	**Unit Rate**	**Cost / lane km**	**Cost / lane m**
Urban Light Paved - 3.25m lane								
Pulverize Existing	1,000	3.250		3250		$2.25	$7,313	$7.31
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
50mm HL8	1,000	3.250	0.05	3250	162.5	$367.50	$59,719	$59.72
Contingency for Minor Contract Items							$50,000	$50.00
						Total (3.25m lane)	**$121,094**	**$121.09**
						Total (6.50m road)	**$242,188**	**$242**
Urban Medium Paved - 3.50m lane (Collector)								
Mill Wear Surface	1,000	3.500		3500		$3.50	$12,250	$12.25
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
40mm HL3	1,000	3.500	0.04	3500	140	$416.50	$58,310	$58.31
Contingency for Minor Contract Items							$50,000	$50.00
						Total (3.50m lane)	**$124,623**	**$124.62**
						Total (7.0m road)	**$249,245**	**$249**
						Total (10.0m road)	**$356,046**	**$356.05**
Urban Heavy Paved - 3.75m lane (Arterial)								
Mill Wear Surface	1,000	3.750		3750		$3.50	$13,125	$13.13
Mill Wear Surface (Binder)	1,000	3.750		3750		$3.50	$13,125	$13.13
Prepare Surface	1,000	3.250		3250		$1.25	$4,063	$4.06
50mm HL8	1,000	3.750	0.04	3750	150	$367.50	$55,125	$55.13
40mm HL3	1,000	3.750	0.04	3750	150	$416.50	$62,475	$62.48
Contingency for Minor Contract Items							$75,000	$75.00
						Total (3.75m lane)	**$222,913**	**$222.91**
						Total (7.5m road)	**$445,825**	**$445.83**
						Total (11.0m road)	**$653,869**	**$654**

STORM SEWER COSTING

STORM SEWER SERVICING - CONSTRUCTION UNIT RATES

ITEMS	$ / m	each	Notes
Concrete Pipe/Culverts			
300mm Concrete Pipe	$175.00		
600mm Concrete Pipe	$365.00		
900mm Concrete Pipe	$555.00		
1200mm Concrete Pipe	$765.00		
1500mm Concrete Pipe	$1,150.00		
1.8 x 1.8m Box Culvert	$2,200.00		
3.0 x 3.0m Box Culvert	$4,500.00		
Storm Sewer Appurtenances			
1200mm Manhole		$3,500.00	
1500mm Manhole		$4,100.00	
1800mm Manhole		$4,500.00	
2100mm Manhole		$6,300.00	
2400mm Manhole		$7,500.00	
Small Custom Struture		$25,000.00	
Large Custom Structure		$38,000.00	
Single Catch Basin		$2,500.00	
Double Catch Basin		$3,500.00	
Ditch Inlet Catch Basin		$3,500.00	
Ditch Inlet Catch Basin Manhole		$7,500.00	
Storm Services			
100mm Residential	$135.00		
150mm Residential	$195.00		
150mm Commercial	$235.00		
200mm Commercial/Industrial	$275.00		
300mm Industrial	$375.00		

URBAN SECTIONS

URBAN - COLLECTION SYSTEMS

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
Residential Storm Water Collection					
300mm Concrete Storm Sewer	300		$175.00	$52,500	$52.50
600mm Concrete Storm Sewer	400		$365.00	$146,000	$146.00
900mm Concrete Storm Sewer	300		$555.00	$166,500	$166.50
1200mm Manholes		6	$3,500.00	$21,000	$21.00
1500mm Manholes		2	$4,100.00	$8,200	$8.20
1800mm Manholes		3	$4,500.00	$13,500	$13.50
Single Catch Basin		10	$2,500.00	$25,000	$25.00
Double Catch Basin		6	$3,500.00	$21,000	$21.00
Residential Services	1,000	100	$135.00	$135,000	$135.00
Commercial Services	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	20	2	$375.00	$7,500	$7.50
Road Reinstatement	1,000		$317.99	$317,990	$317.99
Contingency for Minor Contract Items				$25,000	$25.00
			Total Cost	**$943,890**	**$943.89**
	Total Structures Only (+ 40% Contingency & Road Reinstatement)			**$225,896**	**$226**

Trunk Storm Water Collection					
900mm Concrete Storm Sewer	300		$555.00	$166,500	$166.50
1200mm Concrete Storm Sewer	400		$765.00	$306,000	$306.00
1500mm Concrete Storm Sewer	300		$1,150.00	$345,000	$345.00
1800mm Manholes		6	$4,500.00	$27,000	$27.00
2100mm Manholes		2	$6,300.00	$12,600	$12.60
2400mm Manholes		3	$7,500.00	$22,500	$22.50
Single Catch Basin		10	$2,500.00	$25,000	$25.00
Double Catch Basin		6	$3,500.00	$21,000	$21.00
Residential Services	600	60	$135.00	$81,000	$81.00
Commercial Services	60	6	$235.00	$14,100	$14.10
Industrial Services	60	6	$375.00	$22,500	$22.50
Road Reinstatement	1,000		$444.49	$444,485	$444.49
Contingency for Minor Contract Items				$75,000	$75.00
			Total Cost	**$1,562,685**	**$1,562.69**
	Total Structures Only (+ 40% Contingency & Road Reinstatement)			**$315,894**	**$316**

Large Trunk Storm Water Collection

1500mm Concrete Storm Sewer	300		$1,150.00	$345,000	$345.00
1.8m x 1.8m Box Culvert	400		$2,200.00	$880,000	$880.00
3.0m x 3.0m Box Culvert	300		$4,500.00	$1,350,000	$1,350.00
2400mm Manholes		3	$7,500.00	$22,500	$22.50
Sm. Custom Structure for Box Culvert		4	$25,000.00	$100,000	$100.00
Lg. Custom Structure for Box Culvert		3	$38,000.00	$114,000	$114.00
Single Catch Basin		10	$2,500.00	$25,000	$25.00
Double Catch Basin		6	$3,500.00	$21,000	$21.00
Residential Services	400	40	$135.00	$54,000	$54.00
Commercial Services	100	10	$235.00	$23,500	$23.50
Industrial Services	60	6	$375.00	$22,500	$22.50
Road Reinstatement	1,000		$657.38	$657,380	$657.38
Contingency for Minor Contract Items				$145,000	$145.00
			Total Cost	**$3,759,880**	**$3,759.88**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$603,452**	**$603**

RURAL SECTIONS

RURAL - COLLECTION SYSTEMS

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m

Residential Storm Water Collection

300mm Concrete Storm Sewer	300		$175.00	$52,500	$52.50
600mm Concrete Storm Sewer	400		$365.00	$146,000	$146.00
900mm Concrete Storm Sewer	300		$555.00	$166,500	$166.50
1200mm Manholes		5	$3,500.00	$17,500	$17.50
1500mm Manholes		2	$4,100.00	$8,200	$8.20
1800mm Manholes		3	$4,500.00	$13,500	$13.50
Single Catch Basin		3	$2,500.00	$7,500	$7.50
Ditch Inlet Catch Basin		7	$3,500.00	$24,500	$24.50
Road Reinstatement	1,000		$444.49	$444,485	$444.49
Contingency for Minor Contract Items				$22,500	$22.50
			Total Cost	**$903,185**	**$903.19**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$257,994**	**$258**

Trunk Storm Water Collection

900mm Concrete Storm Sewer	300		$555.00	$166,500	$166.50
1200mm Concrete Storm Sewer	400		$765.00	$306,000	$306.00
1500mm Concrete Storm Sewer	300		$1,150.00	$345,000	$345.00
1800mm Manholes		5	$4,500.00	$22,500	$22.50
2100mm Manholes		2	$6,300.00	$12,600	$12.60
2400mm Manholes		3	$7,500.00	$22,500	$22.50
Ditch Inlet Catch Basin		4	$3,500.00	$14,000	$14.00
Road Reinstatement	1,000		$657.38	$657,380	$657.38
Contingency for Minor Contract Items				$35,000	$35.00
			Total Cost	**$1,581,480**	**$1,581.48**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$348,552**	**$349**

SANITARY SEWER COSTING

SANITARY SEWER SERVICING - CONSTRUCTION UNIT RATES

ITEMS	$ / m	each	Notes
PVC Sanitary Sewer			
150mm PVC Pipe	$215.00		
225mm PVC Pipe	$250.00		
300mm PVC Pipe	$285.00		
375mm PVC Pipe	$310.00		
450mm PVC Pipe	$335.00		
500mm PVC Pipe	$368.33		
525mm PVC Pipe	$385.00		
Concrete Sanitary Sewer			
600mm Concrete Pipe	$385.00		
750mm Concrete Pipe	$735.00		
825mm Concrete Pipe	$900.00		
975mm Concrete Pipe	$1,200.00		
Sanitary Sewer Appurtenances			
1200mm Manhole		$3,500.00	
1500mm Manhole		$4,100.00	
1800mm Manhole		$5,500.00	
Sanitary Services			
100mm Residential	$155.00		
150mm Residential	$215.00		
150mm Commercial	$255.00		
200mm Commercial/Industri	$295.00		
300mm Industrial	$395.00		
Valves			
150mm Valves		$2,500.00	
200mm Valves		$3,250.00	
250mm Valves		$4,000.00	
300mm Valves		$5,000.00	
375mm Vavles		$6,500.00	
450mm Valves		$8,000.00	
600mm Valves		$9,500.00	
ForceMains			
38mm HDPE	$75.00		
50mm HDPE	$115.00		
60mm HDPE	$135.00		
75mm HDPE	$150.00		
100mm HDPE	$165.00		
150mm HDPE	$205.00		
200mm HDPE	$245.00		
300mm HDPE	$325.00		
375mm HDPE			

URBAN & RURAL SECTIONS

SANITARY COLLECTION SYSTEMS

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
Sanitary Collection Sewer (150mm - 300mm ø)					
150mm PVC Pipe	500		$215.00	$107,500	$107.50
300mm PVC Pipe	500		$285.00	$142,500	$142.50
1200mm Manholes		10	$3,500.00	$35,000	$35.00
Residential Services	1,000	100	$155.00	$155,000	$155.00
Commercial Services	20	2	$255.00	$5,100	$5.10
Industrial Services to Proper	20	2	$395.00	$7,900	$7.90
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$1,052,085**	**$1,052.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$274,634**	**$275**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
Sanitary Collection Sewer (300mm - 450mm ø)					
300mm PVC Pipe	500		$285.00	$142,500	$142.50
450mm PVC Pipe	500		$335.00	$167,500	$167.50
1200mm Manholes		10	$5,000.00	$50,000	$50.00
Residential Services	1,000	100	$155.00	$155,000	$155.00
Commercial Services	20	2	$255.00	$5,100	$5.10
Industrial Services to Proper	20	2	$395.00	$7,900	$7.90
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$1,127,085**	**$1,127.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$289,634**	**$290**
Sanitary Collection Sewer (500mm - 750mm ø)					
500mm PVC	600		$368.33	$220,998	$221.00
750mm Concrete Pipe	400		$735.00	$294,000	$294.00
1200mm Manholes		3	$3,500.00	$10,500	$10.50
1500mm Manholes		4	$4,100.00	$16,400	$16.40
1800mm Manholes		3	$5,500.00	$16,500	$16.50
Residential Services	600	60	$155.00	$93,000	$93.00
Commercial Services	60	6	$255.00	$15,300	$15.30
Industrial Services	60	6	$395.00	$23,700	$23.70
Road Reinstatement	1,000		$873.38	$873,380	$873.38
Contingency for Minor Contract Items				$55,000	$55.00
			Total cost per km	**$1,908,412**	**$1,908.41**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$414,752**	**$415**
Forcemains (38mm ø)					
38mm HDPE	1,000		$75.00	$75,000	$75.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$674,085**	**$674.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (50mm ø)

50mm HDPE	1,000		$115.00	$115,000	$115.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$714,085**	**$714.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (60mm ø)

60mm HDPE	1,000		$135.00	$135,000	$135.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$734,085**	**$734.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (75mm ø)

75mm HDPE	1,000		$150.00	$150,000	$150.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$749,085**	**$749.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (100mm ø)

100mm HDPE	1,000		$165.00	$165,000	$165.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$764,085**	**$764.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (150mm ø)

100mm HDPE	1,000		$205.00	$205,000	$205.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$804,085**	**$804.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (200mm ø)

200mm HDPE	1,000		$245.00	$245,000	$245.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$844,085**	**$844.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (300mm ø)

300mm HDPE	1,000		$325.00	$325,000	$325.00
Road Reinstatement	1,000		$574.09	$574,085	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$924,085**	**$924.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,634**	**$240**

Forcemains (300mm ø)

300mm HDPE	1,000		$450.00	$450,000	$450.00
Road Reinstatement	1,000		$574.09	$574,090	$574.09
Contingency for Minor Contract Items				$25,000	$25.00
			Total cost per km	**$1,049,090**	**$1,049.09**
			Total Structures Only (+ 40% Contingency & Road Reinstatement)	**$239,636**	**$240**

*Reduce residential services cost by 60%; commercial services by 20% and industrial services by 80% for rural sections.

WATER SUPPLY COSTING

WATER SUPPLY SERVICING - CONSTRUCTION UNIT RATES

ITEMS	$ / m	each	Notes
Watermain Pipe			
100mm PVC Watermain	$135.00		
150mm PVC Watermain	$175.00		Includes minor fittings, granulars
200mm PVC Watermain	$238.00		Includes minor fittings, granulars
250mm PVC Watermain	$302.00		Includes minor fittings, granulars
300mm PVC Watermain	$365.00		Includes minor fittings, granulars
325mm PVC Watermain	$383.00		Includes minor fittings, granulars
375mm PVC Watermain	$420.00		Includes minor fittings, granulars
450mm PVC Watermain	$475.00		Includes minor fittings, granulars
450mm Pressure Pipe Watermain	$555.00		Includes minor fittings, granulars
600mm Pressure Pipe Watermain	$765.00		Includes minor fittings, granulars
Watermain Appurtenances			
150mm - 450mm Connection to Existing		$8,000.00	
600mm - 1200mm Connection to Existing		$18,000.00	
150mm Hydrants		$4,500.00	
150mm Valves		$2,500.00	
200mm Hydrants		$5,500.00	
200mm Valves		$3,250.00	
250mm Hydrants		$6,000.00	
250mm Valves		$4,000.00	
300mm Hydrants		$6,500.00	
300mm Valves		$5,000.00	
325mm Vavles		$5,500.00	
375mm Vavles		$6,500.00	
450mm Valve Chamber		$21,000.00	
450mm Valves		$8,000.00	
600mm Valve Chamber		$28,000.00	
600mm Valves		$9,500.00	
450mm Connection to distribution		$20,000.00	
600mm Connection to distribution		$30,000.00	
Watermain Services			
19mm Residential	$165.00		Includes valve box at property line
25mm Residential	$195.00		Includes valve box at property line
32mm Commercial	$235.00		Includes valve box at property line
40mm Commercial/Industrial	$275.00		Includes valve box at property line
100mm Industrial	$375.00		Includes valve box at property line

General Notes

Contract size should always be considered, the rates notes above are an average of many executed project tenders

URBAN SECTIONS

URBAN - DISTRIBUTION MAINS

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
100mm PVC					
100mm Watermain	1,000		$135.00	$135,000	$135.00
Hydrants		10	$4,500.00	$45,000	$45.00
Valves		6	$2,500.00	$15,000	$15.00
Residential Services to Property Line	1,000	100	$165.00	$165,000	$165.00
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	20	2	$375.00	$7,500	$7.50
Connection to Existing System`		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$15,000	$15.00
			Total Cost	**$631,110**	**$631.11**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$113,182**	**$113.18**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m

150mm PVC

150mm Watermain	1,000		$175.00	$175,000	$175.00
Hydrants		10	$4,500.00	$45,000	$45.00
Valves		6	$2,500.00	$15,000	$15.00
Residential Services to Property Line	1,000	100	$165.00	$165,000	$165.00
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	20	2	$375.00	$7,500	$7.50
Connection to Existing System`		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$15,000	$15.00
			Total Cost	**$671,110**	**$671.11**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$113,182**	**$113.18**

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**

200mm PVC

200mm Watermain	1,000		$238.00	$238,000	$238.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$3,250.00	$19,500	$19.50
Residential Services to Property Line	1,000	100	$165.00	$165,000	$165.00
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	20	2	$375.00	$7,500	$7.50
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$15,000	$15.00
			Total Cost	**$748,610**	**$748.61**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$127,682**	**$127.68**

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**

250mm PVC

250mm Watermain	1,000		$302.00	$302,000	$302.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$4,000.00	$24,000	$24.00
Residential Services to Property Line	1,000	100	$165.00	$165,000	$165.00
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	20	2	$375.00	$7,500	$7.50
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$15,000	$15.00
			Total Cost	**$817,110**	**$817.11**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$132,182**	**$132.18**

300mm PVC

300mm Watermain	1,000		$365.00	$365,000	$365.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$5,000.00	$30,000	$30.00
Residential Services to Property Line	400	40	$165.00	$66,000	$66.00
Commerical Services to propoerty Line	400	40	$235.00	$94,000	$94.00
Industrial Services to Property Line	200	20	$375.00	$75,000	$75.00
Connection to Existing System`		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$25,000	$25.00
			Total Cost	**$953,910**	**$953.91**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$142,182**	**$142.18**

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**

325mm PVC

325mm Watermain	1,000		$383.00	$383,000	$383.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$5,500.00	$33,000	$33.00
Residential Services to Property Line	400	40	$165.00	$66,000	$66.00
Commercial Services to Property Line	400	40	$235.00	$94,000	$94.00
Industrial Services to Property Line	200	20	$375.00	$75,000	$75.00
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$27,500	$27.50
			Total Cost	**$977,410**	**$977.41**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$146,182**	**$146.18**

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**

375mm PVC

375mm Watermain	1,000		$420.00	$420,000	$420.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$6,500.00	$39,000	$39.00
Residential Services to Property Line	400	40	$165.00	$66,000	$66.00
Commercial Services to Property Line	400	40	$235.00	$94,000	$94.00
Industrial Services to Property Line	200	20	$375.00	$75,000	$75.00
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$30,000	$30.00
			Total Cost	**$1,022,910**	**$1,022.91**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$153,182**	**$153.18**

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**
450mm PVC					
450mm Watermain	1,000		$475.00	$475,000	$475.00
Hydrants		10	$5,500.00	$55,000	$55.00
Valves		6	$8,000.00	$48,000	$48.00
Residential Services to Property Line	400	40	$165.00	$66,000	$66.00
Commercial Services to Property Line	400	40	$235.00	$94,000	$94.00
Industrial Services to Property Line	200	20	$375.00	$75,000	$75.00
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$35,000	$35.00
			Total Cost	**$1,091,910**	**$1,091.91**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$164,182**	**$164.18**

URBAN - TRANSMISSION MAINS

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**
450mm Concrete Pressure Pipe					
450mm Watermain	1,000		$555.00	$555,000	$555.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valve Chamber		4	$21,000.00	$84,000	$84.00
Valves		4	$8,000.00	$32,000	$32.00
Connection to Existing System`		1	$8,000.00	$8,000	$8.00
Connections to Distribution System		4	$20,000.00	$80,000	$80.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$38,000	$38.00
			Total Cost	**$1,054,910**	**$1,054.91**
Appurtenances Replacement Only (+40% Contingency & Road Reinstatement)				**$247,564**	**$247.56**

600mm Concrete Pressure Pipe					
600 Watermain	1,000		$765.00	$765,000	$765.00
Valve Chambers		4	$28,000.00	$112,000	$112.00
Valves		4	$9,500.00	$38,000	$38.00
Connection to Existing System		1	$18,000.00	$18,000	$18.00
Connections to Distribution System		4	$30,000.00	$120,000	$120.00
Road Reinstatement	1,000		$379.69	$379,685	$379.69
Contingency for Minor Contract Items				$50,000	$50.00
			Total Cost	**$1,482,685**	**$1,482.69**
Appurtenances Replacement Only (+40% Contingency & Road Reinstatement)				**$321,874**	**$321.87**

RURAL SECTIONS

RURAL - DISTRIBUTION MAINS

Type/Description	**Length (m)**	**Each**	**Unit Rate**	**Cost / km**	**Cost / m**
150mm PVC					
150mm Watermain	1,000		$175.00	$175,000	$175.00
Hydrants		4	$4,500.00	$18,000	$18.00
Valves		5	$2,500.00	$12,500	$12.50
Residential Services to Property Line	150	15	$165.00	$24,750	$24.75
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	40	4	$375.00	$15,000	$15.00
Connection to Existing System		2	$8,000.00	$16,000	$16.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$10,000	$10.00
			Total Cost	**$511,860**	**$511.86**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$81,682**	**$81.68**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
200mm PVC					
200mm Watermain	1,000		$238.00	$238,000	$238.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valves		5	$3,250.00	$16,250	$16.25
Residential Services to Property Line	150	15	$165.00	$24,750	$24.75
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	40	4	$375.00	$15,000	$15.00
Connection to Existing System		2	$8,000.00	$16,000	$16.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$10,000	$10.00
			Total Cost	**$582,610**	**$582.61**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$89,432**	**$89.43**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
250mm PVC					
250mm Watermain	1,000		$302.00	$302,000	$302.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valves		5	$4,000.00	$20,000	$20.00
Residential Services to Property Line	150	15	$165.00	$24,750	$24.75
Commercial Services to Property Line	20	2	$235.00	$4,700	$4.70
Industrial Services to Property Line	40	4	$375.00	$15,000	$15.00
Connection to Existing System		2	$8,000.00	$16,000	$16.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$10,000	$10.00
			Total Cost	**$650,360**	**$650.36**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$93,182**	**$93.18**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
300mm PVC					
300mm Watermain	1,000		$365.00	$365,000	$365.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valves		5	$5,000.00	$25,000	$25.00
Residential Services to Property Line	100	10	$165.00	$16,500	$16.50
Commercial Services to Property Line	40	4	$235.00	$9,400	$9.40
Industrial Services to Property Line	60	6	$375.00	$22,500	$22.50
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Road Reinstatement	1,000		$379.69	$379,685	$379.69
Contingency for Minor Contract Items				$25,000	$25.00
			Total Cost	**$873,085**	**$873.09**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$132,937**	**$132.94**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
325mm PVC					
325mm Watermain	1,000		$383.00	$383,000	$383.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valves		5	$5,500.00	$27,500	$27.50
Residential Services to Property Line	100	15	$165.00	$16,500	$16.50
Commercial Services to Property Line	40	2	$235.00	$9,400	$9.40
Industrial Services to Property Line	60	4	$375.00	$22,500	$22.50
Connection to Existing System		2	$8,000.00	$16,000	$16.00
Road Reinstatement	1,000		$379.69	$379,685	$379.69
Contingency for Minor Contract Items				$10,000	$10.00
			Total Cost	**$886,585**	**$886.59**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$129,437**	**$129.44**

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
375mm PVC					
375mm Watermain	1,000		$420.00	$420,000	$420.00
Hydrants		4	$5,500.00	$22,000	$22.00
Valves		5	$6,500.00	$32,500	$32.50
Residential Services to Property Line	100	15	$165.00	$16,500	$16.50
Commercial Services to Property Line	40	2	$235.00	$9,400	$9.40
Industrial Services to Property Line	60	4	$375.00	$22,500	$22.50
Connection to Existing System		2	$8,000.00	$16,000	$16.00

Road Reinstatement	1,000		$379.69	$379,685	$379.69
Contingency for Minor Contract Items				$10,000	$10.00
			Total Cost	**$928,585**	**$928.59**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$134,437**	**$134.44**

RURAL - TRANSMISSION MAINS

Type/Description	Length (m)	Each	Unit Rate	Cost / km	Cost / m
450mm Concrete Pressure Pipe					
450mm Watermain	1,000		$555.00	$555,000	$555.00
Hydrants		2	$5,500.00	$11,000	$11.00
Valve Chamber		2	$21,000.00	$42,000	$42.00
Valves		2	$8,000.00	$16,000	$16.00
Connection to Existing System		1	$8,000.00	$8,000	$8.00
Connections to Distribution System		4	$20,000.00	$80,000	$80.00
Road Reinstatement	1,000		$235.91	$235,910	$235.91
Contingency for Minor Contract Items				$45,000	$45.00
			Total Cost	**$992,910**	**$992.91**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$134,182**	**$134.18**
600mm Concrete Pressure Pipe					
600 Watermain	1,000		$765.00	$765,000	$765.00
Valve Chambers		2	$28,000.00	$56,000	$56.00
Valves		2	$9,500.00	$19,000	$19.00
Connection to Existing System		1	$18,000.00	$18,000	$18.00
Connections to Distribution System		4	$30,000.00	$120,000	$120.00
Road Reinstatement	1,000		$379.69	$379,685	$379.69
Contingency for Minor Contract Items				$65,000	$65.00
			Total Cost	**$1,422,685**	**$1,422.69**
Appurtenances Replacement Only (+40% Contingency & 20% Road Reinstatement)				**$176,937**	**$176.94**

KPMG
cutting through complexity

exp.

Asset Management Planning
for the Township of Moonbeam

Appendix I
Infrastructure Priority Classifications

CORPORATION OF THE TOWNSHIP OF FAUQUIER-STRICKLAND

Asset Management Plan
Infrastructure Requirements by Priority Category

Infrastructure Component	Asset Description	Length in km	From	To	Category	Ten Year Investment Requirement Priority 1	Priority 2
Roads	Myllymaa Road	1.5	Felix Rd.	To End	Priority 1	$ 262,933.50	$ -
	Cloutier Road	3.5	Trans Canada Hwy.	To end	Priority 1	$ 613,511.50	$ -
	Thomas Road	0.65	Trans Canada Hwy.	Leveque Rd.	Priority 1	$ 113,937.85	$ -
	Thomas Road	1.2	Leveque Rd.	Felix Rd.	Priority 1	$ 210,346.80	$ -
	St. Amour Road	5.7	Ste. Marie Rd.	To End	Priority 1	$ 999,147.30	$ -
	Felix Road	2.2	Thomas Rd.	To End	Priority 1	$ 385,635.80	$ -
	Blais Road	1.4	Spruce Falls Rd.	To end	Priority 2	$ -	$ 245,404.60
	Lac Gerard Road	1.3	Spruce Falls Rd.	To end	Priority 2	$ -	$ 227,875.70
	St. Amour Road	0.95	Trans Canada Hwy.	Ste. Marie Rd.	Priority 2	$ -	$ 166,524.55
	Sauve Road	1	West End	Spruce Falls Rd.	Priority 2	$ -	$ 175,289.00
	Sauve Road	1.5	Spruce Falls Rd.	Du Depotoir Rd.	Priority 2	$ -	$ 262,933.50
	Sauve Road	1.7	Du Depotoir Rd.	To End	Priority 2	$ -	$ 297,991.30
	Jacques Avenue South	0.11	Gauthier St.	Doyon St.	Priority 3	$ -	$ -
	Filion Street	0.17	Decarie Ave.	Grzela Rd.	Priority 3	$ -	$ -
	Gravel Avenue South	0.05	Guevremont St.	To end	Priority 3	$ -	$ -
	Tremblay Avenue South	0.17	Gauthier St.	Doyon St.	Priority 3	$ -	$ -
	Gauthier Street	0.17	Gravel Ave. S	Tremblay Ave. S	Priority 3	$ -	$ -
	Decarie Avenue	0.16	Doyon St.	Filion St.	Priority 3	$ -	$ -
	Tremblay Avenue North	0.12	Trans Canada Hwy.	Guevremont St.	Priority 3	$ -	$ -
	Belanger Street	0.12	Spruce Falls Rd.	To end	Priority 3	$ -	$ -
	Doyon Street	0.1	Tremblay Ave. S	Grzela Rd.	Priority 3	$ -	$ -
	Doyon Street	0.096	Grzela Rd.	Boily Ave.	Priority 3	$ -	$ -
	Doyon Street	0.18	Boily Ave.	To end	Priority 3	$ -	$ -
	Guevremont Street	0.13	West End	Gravel Ave.	Priority 3	$ -	$ -
	Laferriere Street	0.18	Gravel Ave. S	Tremblay Ave. S	Priority 3	$ -	$ -
	Laferriere Street	0.17	Termblay Ave. S	Jacques Ave.	Priority 3	$ -	$ -
	Laferriere Street	0.16	Jacques Ave.	Descheneaux Ave. S	Priority 3	$ -	$ -
	Laferriere Street	0.14	Descheneaux Ave. S	Dufour Ave. N	Priority 3	$ -	$ -
	Descheneaux Avenue North	0.055	Trans Canada Hwy.	To End	Priority 3	$ -	$ -
	Dufour Avenue	0.11	Laferriere St.	Gauthier St.	Priority 3	$ -	$ -
	Habel Street	0.18	Gravel Ave. S	Tremblay Ave. S	Priority 3	$ -	$ -
	Descheneaux Avenue South	0.12	Laferriere St.	Gauthier St.	Priority 3	$ -	$ -
	Descheneaux Avenue South	0.058	Gauthier St.	Doyon St.	Priority 3	$ -	$ -
	Jacques Avenue South	0.12	Laferriere St.	Gauthier St.	Priority 3	$ -	$ -
	Jacques Avenue North	0.028	Trans Canada Hwy.	To End	Priority 3	$ -	$ -
	Boily Avenue	0.19	Doyon St.	Belanger St.	Priority 3	$ -	$ -
	Tremblay Avenue South	0.08	Trans Canada Hwy.	Laferriere St.	Priority 3	$ -	$ -
	Tremblay Avenue South	0.12	Laferriere St.	Gauthier St.	Priority 3	$ -	$ -
	Gauthier Street	0.17	Tremblay Ave. S	Jacques Ave.	Priority 3	$ -	$ -
	Gauthier Street	0.16	Jacques Ave.	Descheneaux Ave. S	Priority 3	$ -	$ -
	Gauthier Street	0.15	Descheneaux Ave. S	Dufour Ave. N	Priority 3	$ -	$ -
	Grzela Road	0.18	Doyon St.	Bilanger St.	Priority 3	$ -	$ -
	Doyon Street	0.18	Gravel Ave. S	Tremblay Ave. S	Priority 3	$ -	$ -
	Guevremont Street	0.17	Gravel Ave.	Tremblay Ave. N	Priority 3	$ -	$ -
	Guevremont Street	0.11	Tremblay Ave. N	To end	Priority 3	$ -	$ -
Water	All watermains are classified as Priority 3						
Wastewater	All wastewater mains are classified as Priority 3						
Stormsewer	All stormsewer mains are classified as Priority 3						
Facilities	Community Hall / Municipal Admin / Library				Priority 1	$ 25,000.00	$ 107,000.00
	Medical Clinic and Apartment				Priority 2	$ 10,000.00	$ 65,000.00
	Equipment Depot / Fire Hall, Fauquier				Priority 1	$ 51,000.00	$ 61,000.00
	Fire Hall (Strickland)				Priority 2	$ -	$ 5,000.00

CORPORATION OF THE TOWNSHIP OF FAUQUIER-STRICKLAND

Asset Management Plan
Infrastructure Requirements by Priority Category

Infrastructure Component	Asset Description	Length in km	From	To	Category	Ten Year Investment Requirement Priority 1	Priority 2
	Vehicle Storage Building				Priority 1	$ 36,000.00	$ -
	Quonset Storage Building				Priority 3	$ -	$ -
	Storage Shed #1				Priority 3	$ -	$ -
	Storage Shed #2				Priority 3	$ -	$ -
	Sportsplex				Priority 1	$ 137,000.00	$ 115,000.00
	Storage Shed (Health Center)				Priority 2	$ 1,000.00	$ 1,500.00
	Gazebo				Priority 2	$ 3,000.00	$ -
	Tool Shed				Priority 3	$ -	$ -
	Water Treatment Plant				Priority 1	$ 223,000.00	$ 193,000.00
	Pumping Station				Priority 2	$ -	$ 11,000.00
	Cemetary - Vault				Priority 2	$ 2,500.00	$ 3,500.00
	Shed (Landfill)				Priority 2	$ 1,500.00	$ -
	Public Washrooms				Priority 2	$ -	$ -
	Pavillion				Priority 2	$ 5,000.00	$ -
	Lift Station #1				Priority 3	$ -	$ -
	Lift Station #2				Priority 3	$ -	$ -
	Lagoon				Priority 1	$ 50,000.00	$ -
Fleet	Champion 740 motor grader				Priority 1	$ 250,000.00	$ -
	JD 47 Snowblower for M1435"				Priority 2	$ -	$ 15,000.00
	Freightliner Garbage Truck - 1993				Priority 1	$ 80,000.00	$ -
	GMC Pumper - 1975				Priority 1	$ 250,000.00	$ -
	Chevrolet Cube van - 1988				Priority 1	$ 65,000.00	$ -
	4000 Gallons water tanker - 1986				Priority 1	$ 75,000.00	$ -
	3000 Gallons water tanker - 1986				Priority 1	$ 75,000.00	$ -
	Yamaha Rhino ATV				Priority 1	$ 15,000.00	$ -
	Northway Trailer				Priority 3	$ -	$ -
	John Deere 410 4x4 back-hoe				Priority 1	$ 150,000.00	$ -
	Sterling tandem snow plow/sander				Priority 3	$ -	$ -
	John Deere bulldozer 450G				Priority 1	$ 100,000.00	$ -
	Tandem Float Trailer				Priority 1	$ 15,000.00	$ -
	Ford 4x4 pick-up - 2008				Priority 1	$ 35,000.00	$ -
	International 5 ton snow plow/sander				Priority 1	$ 175,000.00	$ -
	GMC 4x4 pick-up				Priority 1	$ 35,000.00	$ -
	John Deere Front Mower M/1435				Priority 1	$ 25,000.00	$ -
Total						**$ 4,475,512.75**	**$ 1,953,018.65**

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Appendix J
Suggested Capital Financing Policy

PURPOSE

The goal of the Municipality's capital financing policy shall be to set out the guiding principles for the financing of future capital expenditures in a manner that considers the infrastructure investment requirements of the Municipality as well as affordability issues for taxpayers.

GLOSSARY

Capital Levy – The amount of money raised through taxation that is transferred to the capital fund or reserves to be used to help pay for the cost of capital projects.

Debt – Any obligation for the payment of money. The Municipality considers debt to consist of debentures, cash loans from financial institutions, capital leases, debenture financing approved through bylaw for which no debt has yet been issued, debenture financing approved through the capital budget for which no bylaw has yet been established, outstanding financial commitments, loan guarantees and any debt issue by, or on behalf of the Municipality, including mortgages, debentures or demand loans.

Long-term Debt – Any Debt for which the repayment of any portion of the principal is due beyond one year.

Municipal Levy – The amount of money raised through taxation by the Municipality for the purposes of funding operating costs as well as the Capital Levy.

POLICY STATEMENTS

1. The Municipality shall increase the Municipal Levy by a minimum of 2% per year for each of the next five years (2014 to 2018 inclusive), with the 2% increase being added to the Capital Levy.

2. The increase in the Capital Levy shall only be used for the following purposes:

    a. To fund capital expenditures;

    b. To increase reserve balances in order to finance future capital expenditures; or

    c. To finance the annual costs associated with Long-term Debt issued in connection with capital projects.

3. Subsequent to the five year phase-in period for increases to the Municipal Levy, the Municipality shall increase the Capital Levy by at least the Consumer Price Index, as published by Statistics Canada.

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Appendix K
Suggested Borrowing Policy

PURPOSE

The goal of the Municipality's debt policy shall be to set out the guiding principles for the approval, issuance and administration of any Municipality debt, which shall adhere to all statutory requirements.

GLOSSARY

Debt – Any obligation for the payment of money. The Municipality considers debt to consist of debentures, cash loans from financial institutions, capital leases, debenture financing approved through bylaw for which no debt has yet been issued, debenture financing approved through the capital budget for which no bylaw has yet been established, outstanding financial commitments, loan guarantees and any debt issue by, or on behalf of the Municipality, including mortgages, debentures or demand loans.

Debt and Financial Obligation Limit – The maximum amount of annual debt servicing costs that a municipality can undertake or guarantee without seeking the approval of the Ontario Municipal Board. The Debt and Financial Obligation Limit is calculated pursuant to *Ontario Regulation 403/02 – Debt and Financial Obligation Limits*.

Lease Financial Agreements – A financial agreement, in accordance with *Ontario Regulation 653/05 – Debt Related Financial Instruments and Financial Agreements*, that a municipality may enter into for the purpose of obtaining long-term financing of a capital undertaking of the municipality.

Long-term Debt – Any Debt for which the repayment of any portion of the principal is due beyond one year.

Material Impact – Under *Ontario Regulation 653/05 – Debt Related Financial Instruments and Financial Agreements*, a Lease Financing Agreement has a material impact on a municipality if the costs or risks associated with the agreement significantly affect the municipality's Debt and Financial Obligation Limit, or would reasonably be expected to have a significant effect on that limit.

POLICY STATEMENTS

1. The Municipality shall only enter into Long-term Debt, including Lease Financing Agreements, where the following conditions are met:

    a. The Long-term Debt will be managed in a manner consistent with other long-term planning, financial and management objectives.

    b. Consideration will be given to the impact on future taxpayers.

    c. Long-term Debt will be managed in a manner to limit financial risk exposure.

    d. The timing, type and term of Long-term Debt will be determined with a view of minimizing long-term cost to the extent possible.

e. The term of Long-term Debt will not exceed the useful life of the particular asset.

f. The issuance of Long-term Debt will not result in the Municipality exceeding its Debt and Financial Obligation Limit.

g. A category of Lease Financing Agreements may be relied upon for non-material or operational leases where the agreements will not, in the opinion of the Treasurer as delegated by Council through this policy, result in a Material Impact for the Municipality.

2. All Debt shall be issued in Canadian dollars.

3. It shall be the general practice to issue Debt where the interest rates will be fixed over its term. The Municipality may issue Debt in which the interest rate will vary where, in the opinion of the Treasurer, it is in the Municipality's best interest to allow the rate to float provided such Debt, in addition to any other Debt, does not exceed fifteen percent (15%) of the total outstanding Debt of the Municipality in accordance with *Ontario Regulation 276/02 – Bank Loans*.

4. Upon the repayment of Long-term Debt, the amounts previously committed to annual debt servicing shall not be removed from the Municipality's budget but rather will be reallocated towards:

    a. Debt servicing costs for new Debt issued by the Municipality; and/or

    b. Contributions to reserves for capital purposes.

5. The awarding of any contract under this Policy, unless otherwise authorized by Council, shall follow the requirements as set out in the Municipality's procurement policy.

6. Council, in conjunction with staff, shall review the Municipality's outstanding Debt in conjunction with the annual budget process.

RELEVANT LEGISLATION

- Municipal Act, 2001
- Ontario Regulation 247/01 – Variable Interest Rate Debentures and Foreign Currency Borrowing
- Ontario Regulation 276/02 – Bank Loans
- Ontario Regulation 278/02 – Construction Financing
- Ontario Regulation 403/02 – Debt and Financial Obligation Limits
- Ontario Regulation 653/05 – Debt Related Financial Instruments and Financial Agreements

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