Municipality of McDougall

Executive Summary & Introduction

Asset Management Plan 2014-2024

January 2014

INTRODUCTION

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INTRODUCTION

EXECUTIVE SUMMARY

The Municipality of McDougall is a geographically large Northern Municipality with a relatively low and seasonal population of 2,604 households. This means a low taxation base and a large number of roads, bridges and waterworks piping to service the area with limited Municipal Staff. Existing infrastructure is ageing; funding is being cut while demand is growing for better roads, bridges, water and waste water works. The solution to this expanding gap is how Municipalities manage assets now to ensure success for the future.

The Asset Management Plan (AM Plan) includes the non infrastructures solutions, maintenance, renewal, replacement and disposal activities of infrastructure used to provide services. Asset Management is a not new concept; it has always been a primary function of local government.

The AM Plan Process defines:

- What does McDougall own? (Inventory)
- What is it worth? (Valuation)
- The level of operation? (Desired Levels of Service)
- What condition is it in? (State of Local Infrastructure)
- What needs to be done? (Asset Management Strategy)
- How much will it cost and how will it be funded? (Financing Strategy)

McDougall currently has a family of six AM Plans including the road system, fleet and equipment, buildings, drinking water, waste water and leachate water. This series of AM Plans is expected to help:

- Council in making service level decisions and approving financial budgets.
- Municipal Staff with the planning, operating and managing of assets.

INTRODUCTION

1.0 Municipal Goals

The Municipality and its infrastructure exist to support the delivery of vital services to the residents of McDougall. The Municipality's goals focus on promoting health, safety, convenience and welfare for the inhabitants of McDougall. Obtaining these goals is dependent on how well the Municipality cares for its infrastructure. For instance, safe drinking water keeps residents healthy and improves their quality of life. While community buildings, beaches and parks enable residents to get out and enjoy living in McDougall. Lastly, roads, bridges and culverts allow residents and visitors to travel around the Municipality to work, visit and shop increasing economic activity. The Asset Management Plan (AM Plan) goal is to promote the provision of services at a level that balances Resident and Council expectations with cost and availability of resources.

2.0 The AM Plan's Impact on the Financial Budget

The AM Plan and the Financial Budget (the Budget) are linked together. There is increased pressure on the Budget with aging infrastructure, funding cuts for infrastructure, rising costs and rising customer expectations. The AM Plan optimizes processes for the creation, operation, renewal, maintenance and disposal of assets. The AM Plan requires the financial support of the Budget to turn planning into spending. The AM Plan positively impacts the Budget as it enables the Municipality to look at the 10 year capital expenditure forecast required and financially plan for those expenses today.

3.0 The AM Plan's Impact on the Official Plan

The Official Plan is based on the values and natural assets of the Municipality. It manages and directs physical changes and impacts McDougall's social, economic and natural environment. McDougall's Official Plan aims to preserve the high quality of life in the Municipality and enhance that quality through preserving the natural environment while encouraging sustainable growth in all sectors to attract new citizens and visitors to the community. The AM Plan seeks to put these goals into action by planning for the future development of the Municipality. The AM Plan is linked to the Official Plan as it acts as a reference guide for service levels, demand management and success measurement.

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4.0 Purpose of the AM Plan

The AM Plan is required in order to prepare the Municipality to meet future service delivery requirements. It sets out strategies and financing to address the capital needs of McDougall's assets.

These strategies include:

- Providing a defined level of service and measuring performance
- Assessing and managing the condition of all assets and related risks
- Taking a lifecycle approach to developing long term asset management strategies that meet or exceed levels of service within budgets
- Developing a long term financial plan to meet the level of service defined for all assets including what expenditures are required and how they will be financed

5.0 Core Services included in the AM Plan

McDougall is a single tier Municipality in Northern Ontario. The table below shows the core services included in this Plan.

Core Service	Replacement Value
1.0 Leachate Water	$1,749,861
2.0 Drinking Water	$10,994,076
3.0 Waste Water	$641,315 (no auxiliary costs included)
Storm Water	*Included with Roads & Bridges*
4.0 Roads & Bridges	$18,414,396
5.0 Fleet & Equipment	$6,037,519
6.0 Buildings	$9,785,000

6.0 AM Plan Coverage & Updating Process

This AM Plan covers the next ten years (2014-2024). It is expected to be updated every four years in time for the first Council meeting after election. The Asset Inventory Register is expected to be updated annually as part of the Budget process.

7.0 AM Plan Development

The Municipality had never developed a comprehensive AM Plan. Instead McDougall maintained and renewed assets on an as needed basis. The tangible capital

asset registry required by PSAB 3150 in 2009 was developed mainly by the Audit Team and needed updating and upgrading to meet AM Plan requirements. McDougall recognized this gap in data and sought out a Municipal Finance Officers Association (M.F.O.A) Intern to develop the AM Plan in conjunction with Management Staff.

7.1 AM Plan Personnel

The AM Plan was a collaborative process for McDougall, it required staff from multiple departments to develop high quality data and strategies. The personnel involved in the creation of the AM Plan are detailed in the table below.

Personnel	Role in AM Plan
Council	• Set levels of service • Approve the AM Plan • Approve Data Verification Policy and Condition Assessment Policy • Ensure resources and funding are available to support the AM Plan • Approve capital purchases outlined in the AM Plan
C.A.O. & Management	• Provide strategic advice and leadership in the development of the AM Plan • Ensure community and stakeholders are included in the AM Plan • Assess level of service performance • Review AM Plan
Managers & Staff	• Develop, maintain and update Asset Inventory Registry • Develop, maintain, update and implement AM Plan • Implement and track AM Plan specified maintenance, renewal, rehabilitation and replacement • Deliver Council approved levels of service

7.2 AM Plan Resources

The Municipality does not have asset management software, nor did it engage any external consultation apart from mandated bridge inspections. The AM Plan was developed entirely in house by Municipal Staff. The major resources involved in the creation of the AM Plan are detailed in the next table.

Resource Category	Resource
Technical Resources	• Microsoft Excel • Microsoft Word • Geographic Information System (G.I.S.) mapping tool • Accounting Software
Internal Resources	• Contract Documents • Invoices • Engineering Reports • Past Financial Statements • Past Financial Budgets • PSAB Tangible Capital Asset Registry • Applicable By Laws • McDougall Official Plan • McDougall Drinking Water Quality Management System (D.W.Q.M.S)
External Resources	• Consumer Price Index (CPI) • Statistics Canada, 2011 Census • City of Hamilton, State of the Infrastructure Report on Public Works Assets 2009 (Road Network, Waste Water, Water System) • City of Cambridge, AM Plan 2013 • City of Cambridge, State of Infrastructure Life-Cycle Analysis Report 2007 • City of Powell River, AM Plan 2013 (Water Supply, Waste Water, Road Network, Buildings, Fleet & Equipment) • Town of Gananoque, Road Needs Study 2009 • Electric Safety Authority, Guidelines for the Design, Installation, Operation & Maintenance of Street Lighting Assets 2011 • Municipal Act, 2001 Ontario Regulation 239/02 (Highway Maintenance Standards) • Saskatchewan Ministry of Municipal Affairs, Asset Management Condition Grading System • Ontario Good Roads Assoc. (O.R.G.A). Guide for Road and Bridge AM Plan Development • M.F.O.A., How to Develop a Municipal Asset Management Plan

7.3 AM Plan Limitations

McDougall is a geographically large Northern Municipality with a relatively low and seasonal population of 2,604 households. This means a low taxation base and a large number of roads, bridges and waterworks piping to service the area with limited Municipal Staff. The major challenges McDougall faced are included in the table below.

Challenge	Strategy
No Engineering Department to provide condition assessments and assessment criteria.	McDougall relied on Roads, Water and Building Managers to provide assessments in conjunction with Engineering reports when available.
No Asset Management Department or software.	The Municipality relied on M.F.O.A. Intern to collect and manage data in Microsoft Excel.

8.0 AM Plan Evaluation

The AM Plan will be evaluated by Council.

9.0 AM Plan Improvement & Implementation Plan

This AM Plan is the first of its kind in McDougall and is expected to be refined through further iterations of the AM Plan. The major improvement plans are detailed below.

Item	Expected Implementation
Approve Data Verification & Condition Assessment Policies	March 2014
Equipment, Building & Land AM Plan	January 2014
AM Plan 4 year updating Guide Book	June 2014
Further integration of McDougall assets with G.I.S database with the AM Plan	24 month period
Further G.I.S. mapping of assets	24 month period
Performance Measurement	Continual

10.0 Future demand

The levels of service discussed individually in the six AM Plans outline the performance measures, and targets Council has approved. These identified targets are impacted by service demand increases and decreases. These impacts are explored in the table below.

Demand Driver	Present Position	Projection	Impact on Services
Population	2,844 people	2006-2011 population increase 4.7%*. Projecting a 4.7% increase 2012-2017.	Small increase in demand for all services.
Housing Density	Majority of residential properties are single dwelling 1,035.	No major (50+) subdivisions or multiple dwellings anticipated.	No major increase in service demand from new major subdivisions or multiple dwellings.
Demographic	60% of residents are permanent, the rest are seasonal. Median age of population 42.2.	No change. Median age increase.	Continued increased demand for services in the summer. Slight reduction in individual household water usage.
Climate Change	Sufficient rainfall to replenish water source lakes. Rainfall contributions to wastewater mains. Rainfall contributions to roadways and buildings.	Slight increase in rainfall. Increase to waste water inflow mains and treatment facilities in summer. Increased rainfall raises probability for flash flooding.	Increased amount of treatable drinking water. Increased strain on waste water intake valves. Increased demand on roadway drainage, and snow removal.
Social Pressure	Unlimited Use. Some concern over building emissions. Some concern over vehicle emissions.	Introduction of residential water meters where Municipal water facilities exist. Introduction of energy reduction policies in buildings. Increased bicycle usage.	Reduction in residential water use and wastewater contributions. Reduction in energy use. Increased demand for bicycle lanes.

**Statistic Canada Census 2011*

10.1 Asset Demand Management Strategies

Demand for new or increased services will be managed by acquiring new, efficient and effective assets. To ease capital budget constraints, the Municipality will consider alternative financing agreements and options outside asset ownership (e.g. capital leases, contracted services, etc.). Existing service demand will be managed by upgrading and maintaining assets to meet increased demand and reduce the potential for failure. This strategy may also include reducing levels of service and allowing some assets to deteriorate beyond current condition.

10.2 Non Asset Demand Management Strategies include:

- Insuring against risk.
- Educating customers about conservation (home conservation kits).
- Effectively managing risk.
- Looking for opportunities to become more efficient service providers.
- Introducing supply controls (metering, water level signage).

Municipality of McDougall

1.0 Leachate Water System

Asset Management Plan

December 2013

1.0 LEACHATE WATER SYSTEM

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1.0 LEACHATE WATER SYSTEM

STATE OF INFRASTRUCTURE

1.1 Inventory

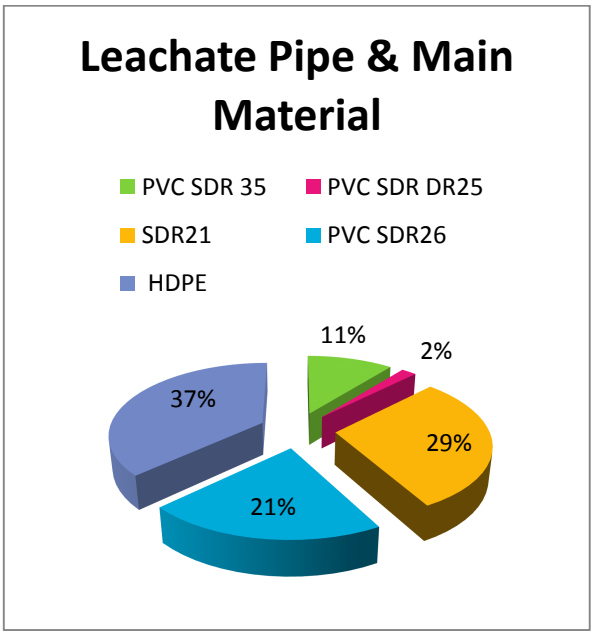
The Municipality's leachate water system consists of a network of force mains, pipes, maintenance holes, chambers, pumping station and a leachate water treatment plant.

The current inventory is broken down in Figure 1.1. The source of the information is the Asset Inventory Registry.

For analysis, the Municipality relied on internal knowledge of the system, contract documents, and Engineering reports.

Figure 1.1: Leachate Water Inventory Summary

Asset Type	Asset Component	2012 Inventory
Linear	**Force mains** 75mm	163m
	Local Sewers 450mm 200mm 150mm	73m 2,553m 400m
	Maintenance Holes	16
	Valves & Chambers	6
Facilities	Pumping Station Structures	1
	Storage Tanks	4
	Wastewater Treatment Plants	1
	Wastewater Treatment Equipment	93
	Pumping Station Equipment	14



1.0 LEACHATE WATER SYSTEM

1.2 Valuation

The historical cost of the leachate water system is shown at 2007 values. This is the year when the collection system was upgraded to a waste water processing facility. The historical cost is shown without inflation apart from leachate collection assets that were part of the 1991 Landfill acquisition and upgrade project; these assets have been inflated using CPI figures to 2007 values.

The estimated replacement value of the system is based on 2007 values, inflated using CPI figures to 2012 values. The estimated current replacement value (2012) of the leachate system is $1,749,862 or $672 per household in McDougall. The replacement cost is lower than the historical value of the system because it contains assets no longer used by the Municipality for leachate collection as the leachate water is now treated; these assets will not be replaced.

Figure 1. 2 below shows the breakdown of historical and replacement costs.

Figure 1.2: Leachate Water System Historical & Replacement Value

Asset Type	Asset Component	Historical Cost 2007	Replacement Value 2012	Percent of Replacement
Linear	**Force mains** 75mm	$2,854	$3,105	0.2%
	Local Sewers 450mm 200mm 150mm	 $26,974 $170,518 $42,805	 $29,348 $185,524 $46,572	 1.7% 10.6% 2.7%
	Maintenance Holes	$109,051	$32,109	1.8%
	Valves & Chambers	$21,008	$22,857	1.3%
	Value Sub Total	***$373,211***	***$319,515***	***18.3%***
Facilities	Pumping Station Structures	$29,361	$13,822	0.8%
	Storage Tanks	$92,213	*not being replaced*	0.0%
	Wastewater Treatment Plants	$987,000	$1,073,856	61.4%
	Wastewater Treatment Equipment	$259,224	$284,283	16.2%
	Pumping Station Equipment	$81,757	$58,384	3.3%
	Value Sub Total	***$1,449,554***	***$1,430,346***	**81.7%**
Total Value		***$1,822,765***	***$1,749,861***	***100%***

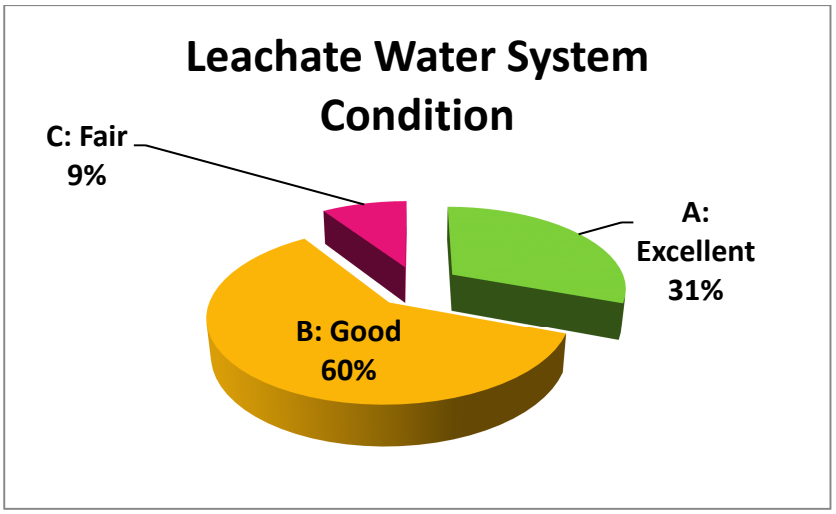
1.0 LEACHATE WATER SYSTEM

1.3 Condition Assessment

The condition report in Figure 1.3 was developed by Municipal Staff with consideration of current legislative requirements, and Engineering reports. The Municipality chose to rely on Municipal Staff and Engineering reports in determining the condition of the system due to the number of external variables and high degree of internal knowledge of the system. Condition assessment criteria are available in the Appendix 1.0. Assets rated C in the pie chart below include minor leachate equipment that is scheduled for renewal in the next 10 years.

Figure 1.3: Leachate Water System High Level Condition Assessment

Asset Type	Asset Component	Condition
Linear	**Force mains** 75mm	B
	Local Sewers 450mm 200mm 150mm	A B A
	Maintenance Holes	B
	Valves & Chambers	A
Facilities	Pumping Station Structures	A
	Storage Tanks	A
	Wastewater Treatment Plants	B
	Wastewater Treatment Equipment	B
	Pumping Station Equipment	A



1.0 LEACHATE WATER SYSTEM

1.4 Lifecycle Activities

The leachate assets can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 1.4.

Figure 1.4: Leachate Water System Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: inspections, monitoring, cleaning, flushing, testing, etc.	75-100%
Major Maintenance	Unplanned maintenance & repair: repairing water main breaks, repairing valves, replacing pipes, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: lining pipes, refurbishing equipment, etc.	25 - 50%
Replacement	End of asset life: decommission, remove old asset and install a new asset that does the same job	0 -25 %

1.5 Life Expectancy

There are numerous direct and indirect variables that affect the useful lives of water assets such as climate, soil condition, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff and Engineering reports in gauging useful life and life remaining for McDougall's leachate water system.

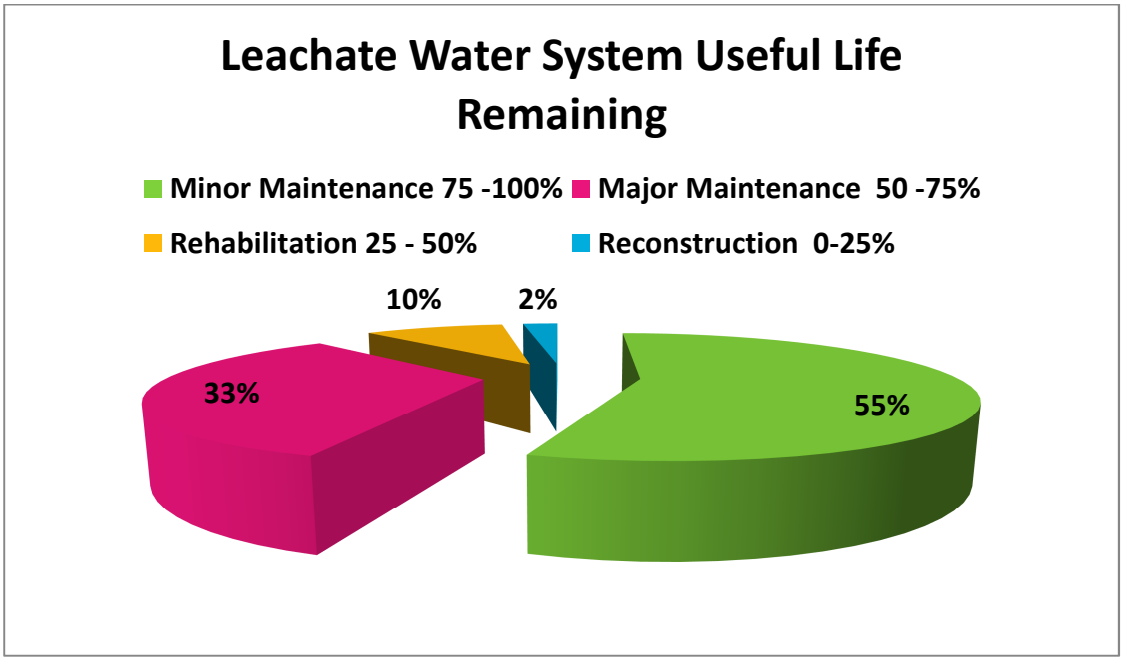
The system is still relatively new and data about life expectancy will be refined with further iterations of the plan as more data about asset performance becomes available. Figure 1.5 shows the useful life of the leachate assets; Figure 1.6 shows the remaining lives and the lifecycle activities that are being applied.

1.0 LEACHATE WATER SYSTEM

Figure 1.5: Leachate Water System Useful Life

Asset Type	Asset Component	Useful Life
Linear	**Force mains** 75mm	75
	Local Sewers 450mm 200mm 150mm	75 75 75
	Maintenance Holes	75
	Valves & Chambers	75
Facilities	Pumping Station Structures	75
	Storage Tanks	100
	Wastewater Treatment Plants	35
	Wastewater Treatment Equipment	21
	Pumping Station Equipment	50

Figure 1.6: Leachate Water System Remaining Useful Life



1.0 LEACHATE WATER SYSTEM

DESIRED LEVEL OF SERVICE

1.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 1.7 and 1.8 cover both leachate and sanitary waste (waste water). These Figures identify target levels of service, and current performance relative to the measures identified. Future demand drivers, forecasts and effects were discussed in the Asset Management Plan Introduction Section 8.0 which includes all assets covered in the plan. Levels of service definitions are available in the Appendix 2.0.

1.0 LEACHATE WATER SYSTEM

Figure 1.7: Waste Water Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	Waste and leachate water is collected, treated and disposed of in accordance with all applicable legislation.	Number of contamination cases.	0 Contamination cases.	0 Contamination cases.
Reliability	Minimize equipment failure and blockages in piping.	Number of equipment failures Number of blockages.	0 Equipment failures. 0 Blockages.	0 Equipment failures. 0 Blockages.
Safety	Provide users with a safe collection of waste and leachate water.	Number of pipe line breaks per 100km. Repair time after pipe breaks. Customer service request response time.	0 Pipe line breaks per 100km. No breaks. Completed within 24 hours in 2012	0 Pipe line breaks per 100km. 12 hour repair time after pipe breaks. 12 hour response time.
Quality	Waste and leachate water system is operating effectively.	Number of customer service requests regarding quality of collection.	0 Customer service requests regarding quality of collection.	1 Customer service requests regarding quality collection.
Capacity	Supply enough piping and mains for collecting and expelling leachate and waste water.	Occurrences of inflow and filtration volumes surpassing limits. Number of backups.	0 Inflow and filtration incidents. 0 Backups.	0 Inflow and filtration incidents. 0 Backups.

1.0 LEACHATE WATER SYSTEM

Figure 1.8: Waste Water Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Waste and leachate water is treated in accordance with legislated standards.	Number of inspections. Waste and leachate water flushing and cleanings.	All inspections and sampling completed daily. 2012 flushing and cleanings completed.	Daily inspections and samplings (M.O.E. regulation). Annual flushing and cleaning (M.O.E. regulation).
Maintenance	Respond to customer service requests and provide scheduled maintenance.	Work related to customer requests and scheduled maintenance completion times.	All maintenance completed within 24 hours of beginning/notice.	All maintenance completed within 12 hours of beginning/notice.
Renewal	Useful lives of infrastructure should be increasing with the replacement of components.	Infrastructure useful lives.	Average useful life is increasing with renewals. Average Asset Life: Waste Water: 54% Leachate Water: 67%	Infrastructure components are replaced before the end of the assets' lifecycle.
Upgrade/New	MOE does not permit McDougall to add any users to the Septic System; deemed at capacity. Wastewater treatment assets at the landfill meet solid waste inflow.	Capacity of the Leachate collection assets.	Leachate collection assets exceed inflow.	Wastewater treatment infrastructure at the landfill is sufficient for amount of solid waste.

1.0 LEACHATE WATER SYSTEM

ASSET MANAGEMENT STRATEGY

1.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Figure 1.9 identifies critical assets in the leachate system.

Figure 1.9: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Treatment Plant	Treat leachate water to legislated levels.	Untreated leachate water discharge.
2	Pump Station	Continuously pump leachate water.	Untreated leachate water discharge.
3	Collection Network	Collect and move leachate water through the system.	Leachate water back up & environmental contamination.

1.8 Maintenance & Operations Plan

Maintenance Activities: includes all actions necessary for keeping assets at their operable capacity. These actions were previous discussed in Figure 1.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities: affect service levels by determining day to day servicing of the leachate system. These activities determine leachate water quality, life of equipment, etc.

1.0 LEACHATE WATER SYSTEM

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Environment Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Maintaining service risk and mitigation strategy database.
- Undertaking capital activities through a planned replacement and renewal system**.**

1.9 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 1.10 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 1.10: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Total value represents the highest net value to Municipality	10%
Has highest age relative to assets in group	10%
Has high operational or maintenance costs	10%
Replacement cost is less than maintenance and/or operating cost	10%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

1.0 LEACHATE WATER SYSTEM

1.10 Disposal Plan

Disposal includes any activity associated with removing a decommissioned asset from the Municipality. These activities include sale, demolition or relocation to another department. Only leachate equipment assets have been identified in this Plan as requiring disposal. The following procedures are followed by the Municipality when disposing of assets.

Surplus capital assets will be disposed of in the following manner:

- Disposals will be authorized by C.A.O and Management Staff
- Competitive bid process through a Request for Quotations
- Public auction
- Trade-In

Invitations to bid on capital assets offered for sale by the Municipality will be:

- Posted on the Municipality's website for at least 14 days before the closing date of the invitation to bid
- Published in at least one edition of the local newspapers

1.11 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

1.12 Risks Involved with the Plan

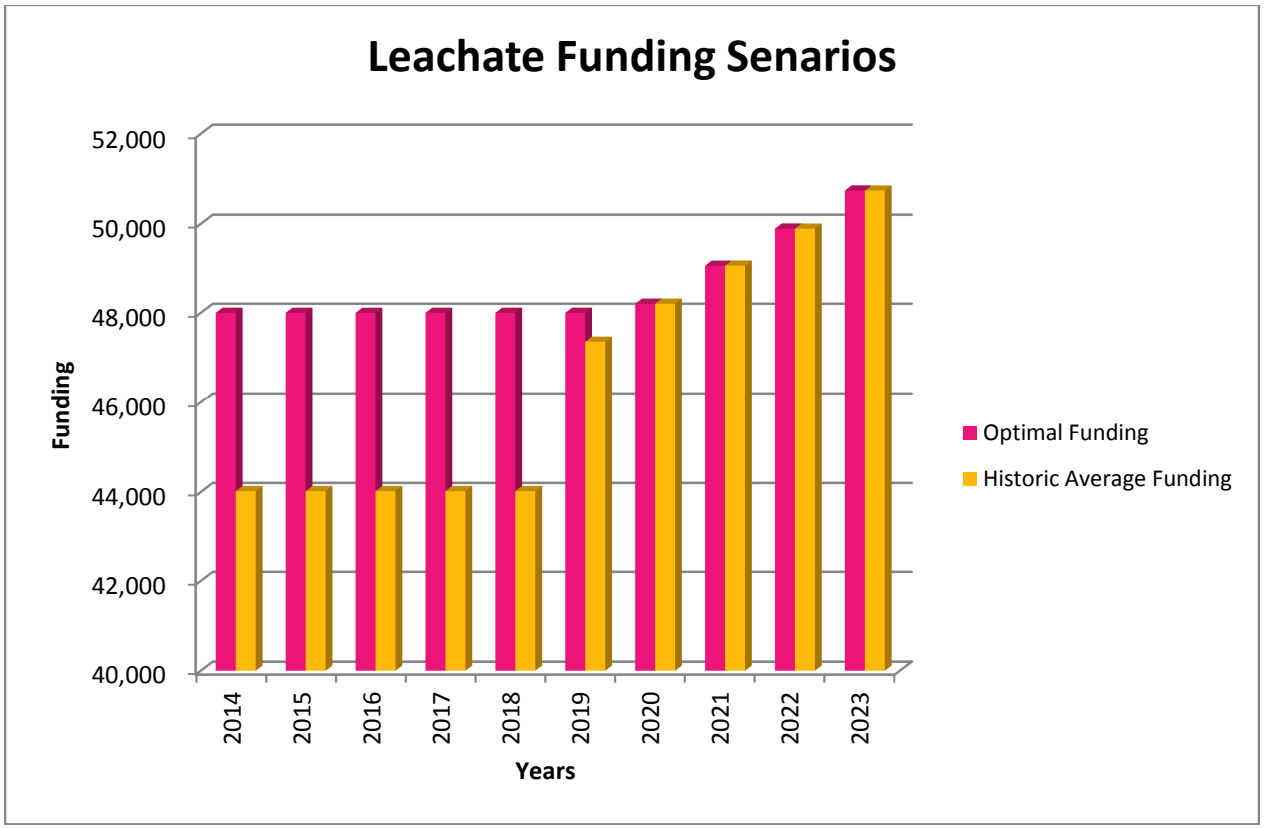
Optimal Capital Funding vs. Budgeted Capital Funding

The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the following two scenarios in Figure 1.11.

Scenario 1: Optimal funding for capital renewals, maintenance and operation activities required by the leachate assets over the next 10 years is $485,881Based on 10 years, a budget of $48,588 would be required annually for optimal leachate funding and capital reserve building.

Scenario 2: Over the last three years the Municipality has spent an annual average of $44,018 or $132,054 total operating, maintaining and renewing the system. Based on this average, McDougall projects an average budget of $46,532 annually with inflation or $465,325 total over the 11 years. This projection provides enough funding to replace assets up for renewal. In this scenario McDougall relies on reserves contributed from 2014-2019 to fund renewals from 2019 onwards. It does not allow the Municipality to contribute to reserves to prepare for the renewals needed 15-20 years from now.

Figure 1.11: Optimal vs. Budgeted Funding Strategies



What McDougall Cannot Do

The Municipality is able to allocate the additional ~$2,000 annually to the leachate system for renewals and capital reserve building (Scenario 1). McDougall is able to fund the system and there are no gaps.

Service Consequences

Consequences occur when the Municipality decides not to undertake asset lifecycle activities after considering the strategies above. These consequences may impact users' service experience and are explored in Figure 1.12.

Figure 1.12: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o More minor repair work for Municipal Staff o Stress on resources o Reactive maintenance	o Regular inspections of minor assets
The Municipality will only stock basic replacement parts for critical assets.	o Long wait times for replacement parts o Service interruptions	o Routine, scheduled preventative maintenance on minor assets in poor condition and intensive monitoring

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous subsections. The leachate collection system became fully operational in 2010, future financial projections will be improved as more reliable expenditure and asset performance information becomes available. For data confidence information see Appendix 3.0.

1.13 Ten year Leachate System Expenditure Projections

The optimal expenditure forecast for the next 10 years is shown in Figure 1.13. It includes projections for reserve building, operating, renewal, and maintenance activities. Note that all costs are shown with 2% annual inflation on 2010 - 2012 values.

The total renewal and maintenance expenditure excluding asset replacement reserve contributions is $334,708 or $129 per McDougall household over the next 11 years. If modest reserve contributions of are included the total, it rises to $382,395 or $147 over 11 years. Note neither of these totals includes operating expense which is projected to be between $9,000 and $11,000 annually.

For comparative purposes Figure 1.14 shows leachate expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure1.13: Projected Operating & Capital Expenditure

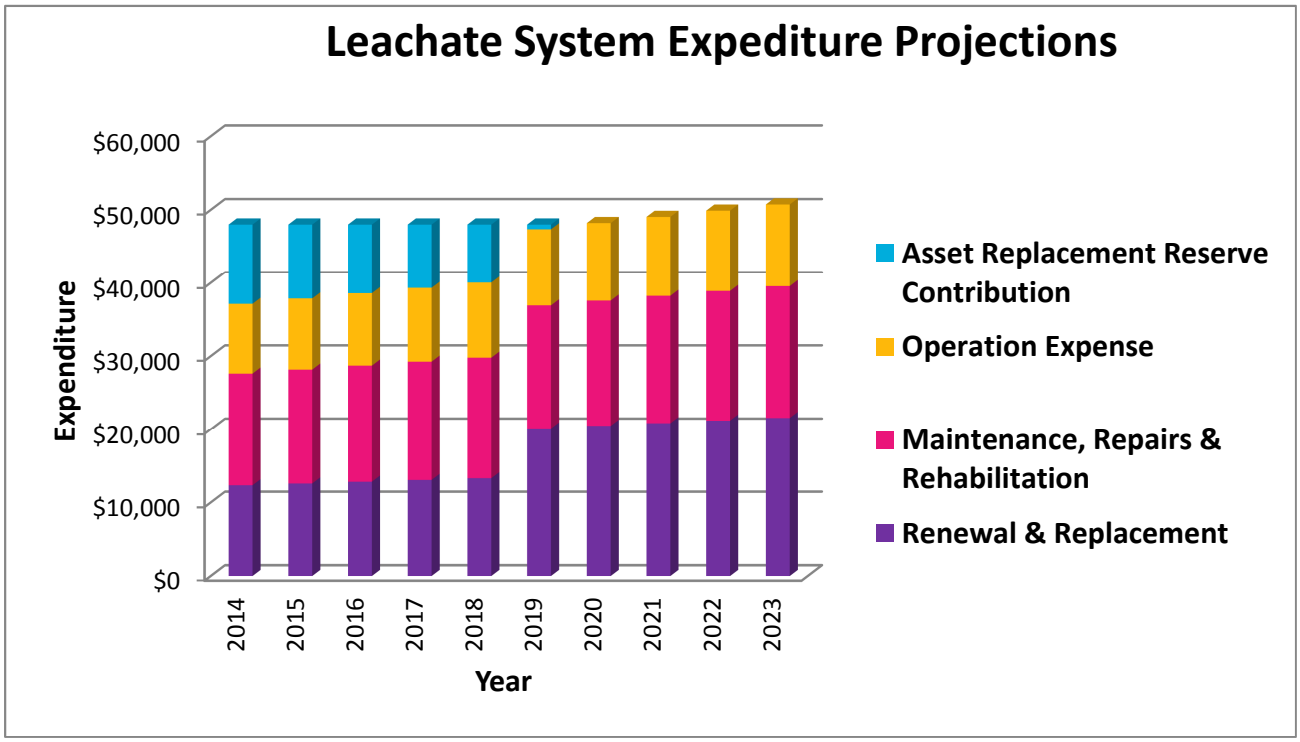
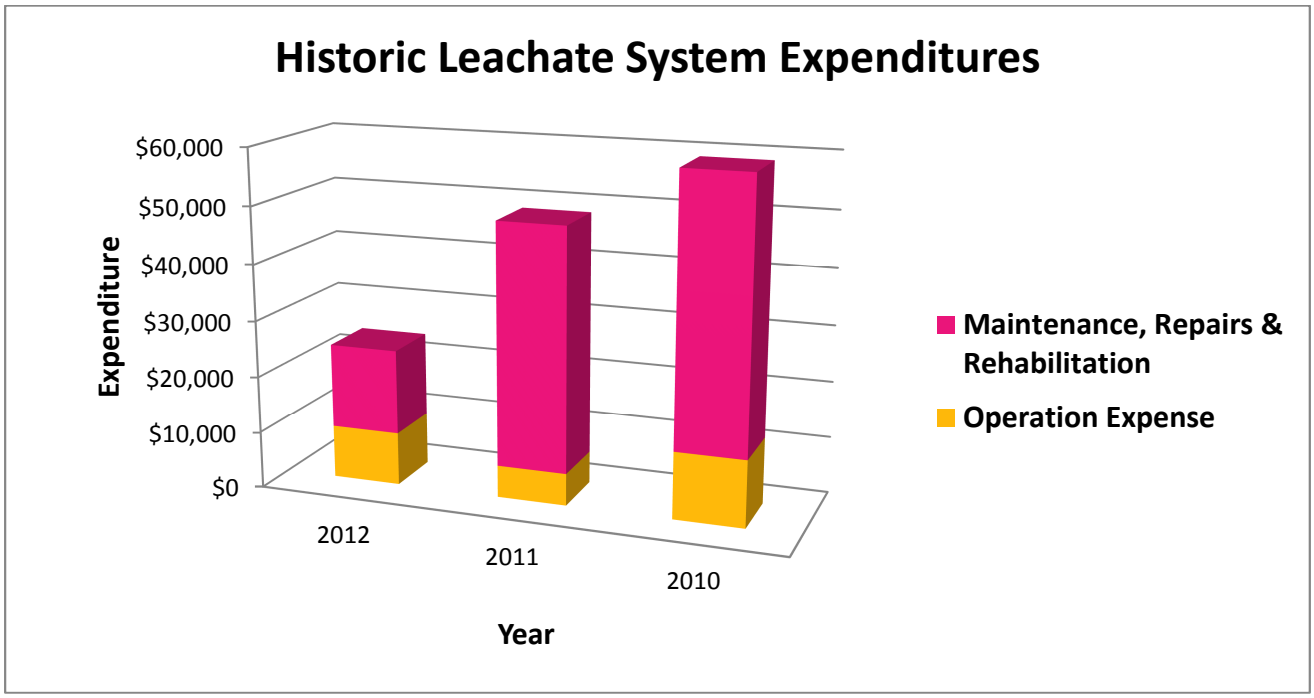


Figure 1.14: Historical Leachate System Expenditures



1.0 LEACHATE WATER SYSTEM

There is a definite change between historical spending and the ten year projections. Over the last three years the Municipality has not replaced or renewed any major leachate assets. Going forward there are projected replacements and renewals beginning in 2014 as asset conditions continue to deteriorate, especially in regards to minor equipment. There is a major spike in 2020 as many of the large assets' lives come up for renewal.

Since the 2010 - 2011 issues associated with beginning a new operation have been worked out; maintenance repairs and rehabilitation are expected to remain at the 2012 level.

In the past the Municipality has not invested in reserves for the system due to unplanned spending on repairs in 2010 and 2011. Looking at future projections the reserve contributions are necessary to maintain service delivery standards in the future.

1.14 Ten year Leachate System Funding Projections

The optimal funding forecast for the next 10 years is shown in Figure 1.15. Funding requirements cover all renewal, maintenance, and operating expenses. The leachate collection system is an integral part of the Landfill; it does not generate its own revenues and therefore is dependent on Landfill revenues that are shared between multiple departments. All revenue allocated to leachate collection has been used to cover expenses and comes solely from Landfill revenues. Note no inflation has been added to leachate budget projections because it is a cost centre.

For comparative purposes Figure 1.16 shows Landfill revenues allocated to leachate collection from 2010 – 2012. These figures are compared against Landfill net income and revenue for the same period. Note that all revenues are shown without inflation.

Figure 1.15: Leachate System Funding Projections

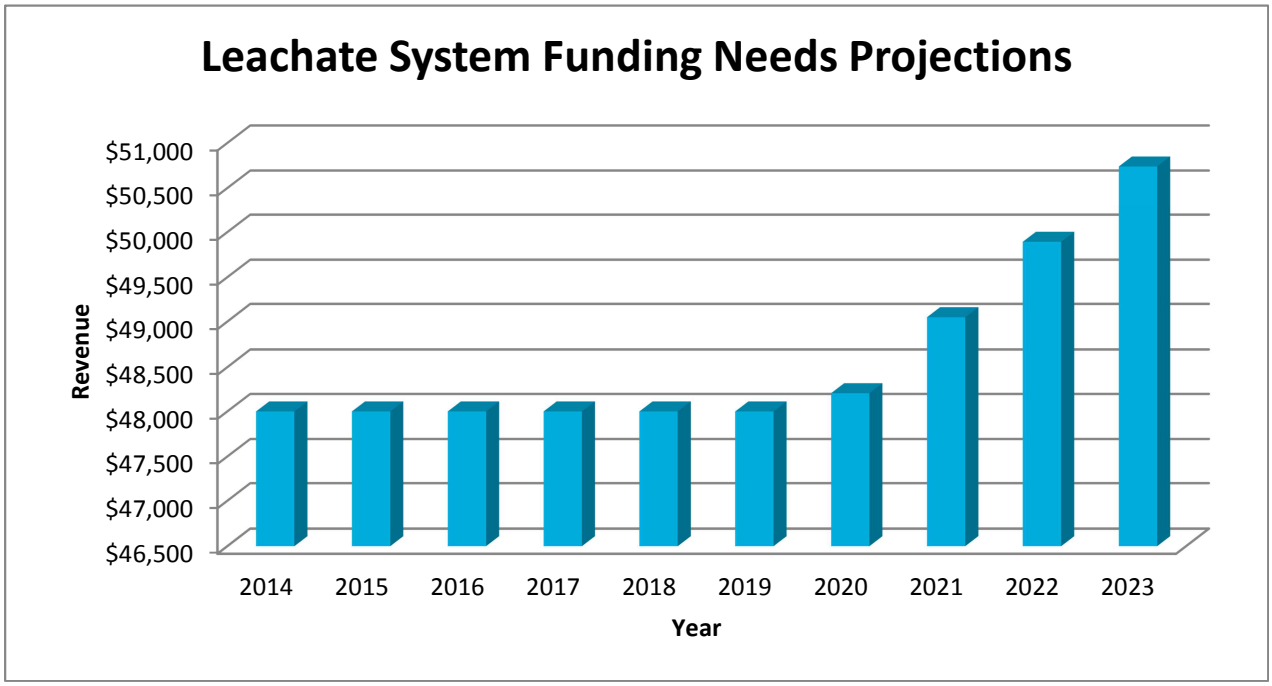
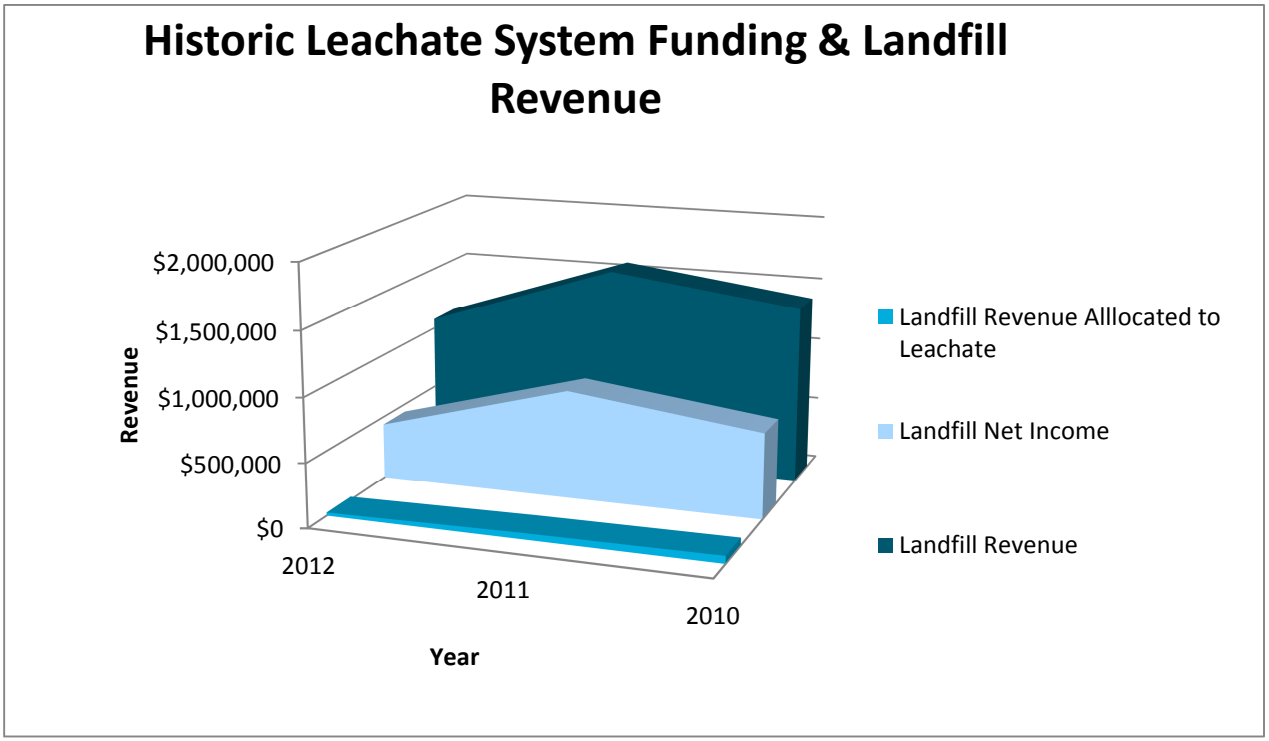


Figure 1.16: Historical Leachate System Funding



1.0 LEACHATE WATER SYSTEM

1.15 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the leachate system Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio	100%

The ratio above indicates that all renewals are fully funded for the next 10 years with the Asset Management Plan in place. There is no infrastructure gap.

1.0 LEACHATE WATER SYSTEM

APPENDIX

1.0 CONDITION ASSESSMENT CRITERIA

Condition		
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required	Normal PM
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required	Normal PM + Minor M.
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended.	Normal PM + Major M.
D	**Critical:** Extensive deterioration, barely functional. Immediate action required	Major Repair + Rehab.
F	**Failed:** No longer functioning. Immediate action required	Rehab. Unlikely = Replace

Capacity	
A	System can support over 100% of demand
B	System can support over 90-99% of demand
C	System can support over 80-89% of demand
D	System can support over 70-79% of demand
F	System can support less than 70% of demand

Performance	
A	Exceeds / Meets all Performance Targets
B	Minor Performance Deficiencies
C	Considerable Performance Deficiencies
D	Major Performance Deficiencies
F	Does not meet any Performance Targets

1.0 LEACHATE WATER SYSTEM

Reliability		
A	As Specified by Manufacturer	Never Failed
B	Random Breakdown	Fails every 20 Years
C	Occasional Breakdown	Fails every 5 Years
D	Periodic Breakdown	Falls every 2 Years
F	Continuous Breakdown	Fails Annually

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or not the service valuable to the public.

These performance measures include:

Purpose: Does the service satisfy users' needs?

Reliability: Does the service have the capability to maintain its functions on a routine basis?

Safety: Are the users protected from potential risks associated with the service?

Quality: Does the service fulfill its purpose to a high degree of excellence?

Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.

1.0 LEACHATE WATER SYSTEM

These activities affect the annual operating budget as the following performance measures:

Operations: routine activities that provide the service.

Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.

Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Operation Expenditure	A	Based on actual spending records. Consideration given to historical records.
Maintenance Expenditure	A	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from asset registry, Municipal Water Works Staff recommendations and industry standards
Asset Useful Lives	B	Based on Municipal Water Works Staff recommendations and industry standards

1.0 LEACHATE WATER SYSTEM

4.0 FUNDING SCENARIOS – OPTIMAL VS. HISTORIC AVERAGE

Leachate Water Financing	Scenario One - Optimal Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Allocated Revenue from Landfill	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Reserve Draw Down	-	-	-	-	-	-	202	1,047	1,893	2,739	-
TOTAL REVENUE	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,202**	**49,047**	**49,893**	**50,739**	**48,000**
OPERATION EXPENSE											
Operation Expense	9,510	9,696	9,883	10,069	10,255	10,442	10,628	10,815	11,001	11,188	11,374
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal & Replacement	12,335	12,577	12,818	13,060	13,302	20,124	20,484	20,843	21,202	21,562	13,533
Maintenance, Repairs & Rehabilitation	15,291	15,591	15,891	16,190	16,490	16,790	17,090	17,390	17,690	17,989	18,289
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution	10,865	10,137	9,409	8,680	7,952	644	-	-	-	-	4,803
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve	-	10,865	21,002	30,411	39,091	47,043	47,485	46,438	44,545	41,806	41,806
TOTAL EXPENSE	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,202**	**49,047**	**49,893**	**50,739**	**48,000**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**--**	**-**	**-**	**-**	**-**	**-**	**-**

*** All figures shown in CAD $**
****Reserve based on capital needs over next 30 yrs**
***** Forecasted revenues & expenditures are based on 2012 actual spending because of instability in first 2 years of operation, 2010-2011**
******Inflation assumption is 2 %**

1.0 LEACHATE WATER SYSTEM

Scenario Two - Historic Funding											
Leachate Water Financing	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
REVENUE											
Allocated Revenue from Landfill	44,018	44,018	44,018	44,018	44,018	44,018	44,018	44,018	44,018	44,018	44,018
Reserve Draw Down	-	-	-	-	-	3,339	4,184	5,030	5,875	6,721	-
TOTAL REVENUE	**44,018**	**44,018**	**44,018**	**44,018**	**44,018**	**47,357**	**48,202**	**49,048**	**49,893**	**50,739**	**44,018**
OPERATION EXPENSE											
Operation Expense	9,510	9,696	9,883	10,069	10,255	10,442	10,628	10,815	11,001	11,188	11,374
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal & Replacement	12,335	12,577	12,818	13,060	13,302	20,124	20,484	20,843	21,202	21,562	13,533
Maintenance, Repairs & Rehabilitation	15,291	15,591	15,891	16,190	16,490	16,790	17,090	17,390	17,690	17,989	18,289
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution	6,882	6,154	5,426	4,698	3,970	-	-	-	-	-	821
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve	-	6,882	13,036	18,462	23,160	23,791	19,607	14,577	8,702	1,981	1,981
TOTAL EXPENSE	**44,017**	**44,017**	**44,017**	**44,018**	**44,018**	**47,356**	**48,202**	**49,047**	**49,893**	**50,739**	**44,018**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

*** All figures shown in CAD $**
****Reserve based on capital needs over next 30 yrs**
***** Forecasted revenues & expenditures are based on 2012 actual spending because of instability in first 2 years of operation, 2010-2011**
******Inflation assumption is 2 %**

1.0 LEACHATE WATER SYSTEM

5.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM

Asset Component	Quantity	Unit	Useful Life	Life Remaining	2019 Renewals	2024 Renewals
safety equipment, lab sink, pressure tank, water heater, sanitary accessories	18	each	10	40%	$ 3,264	
septic system	1	each	30	80%		
chemical feed pumps	6	each	10	40%	$ 18,000	
chemical injectors & accessories	3	each	10	40%	$ 1,500	
back pressure relief valves and feed lines	3	each	5	-20%	$ 1,500	$ 1,500
submersible mixers	2	each	2	0%	$ 7,000	$ 7,000
pressure gages (100mm dia. 12mm bronze threads)	2	each	5	60%	$ 200	$ 200
pressure switches	2	each	10	40%	$ 1,000	
fabricated gates	2	each	30	80%		
course bubble aeration system	2	each	30	80%		
automatic valve for return activated sludge (RAS) wasting	1	each	10	40%	$ 3,500	
process pumps	3	each	10	40%	$ 10,500	
blower & motor	2	each	15	60%		$ 35,000
sensors (pH analyzer, ORP analyzer, aquametrix analyzer & sensor)	8	each	15	60%		$ 4,500
transmitters (flow transmitters, level arm float switch)	10	each	15	60%		$ 4,500
analyzers (pH, ORP & DO)	6	each	15	60%		$ 4,500
flow meters (25, 50 & 75mm)	6	each	20	70%		
gas detectors for methane	1	each	10	40%	$ 4,500	
wall exhaust fans	1	each	15	60%		$ 10,880
thermostats	1	each	15	60%		$ 10,880
louvers	7	each	15	60%		$ 10,880
leachate water treatment building - repairs	1	each	35	83%	$ 9,500	
			Total Program		***$ 60,464***	***$ 89,840***

Municipality of McDougall

2.0 Drinking Water System

Asset Management Plan

December 2013

2.0 DRINKING WATER SYSTEM

Contents

2.0 DRINKING WATER SYSTEM

STATE OF INFRASTRUCTURE

2.1 Inventory

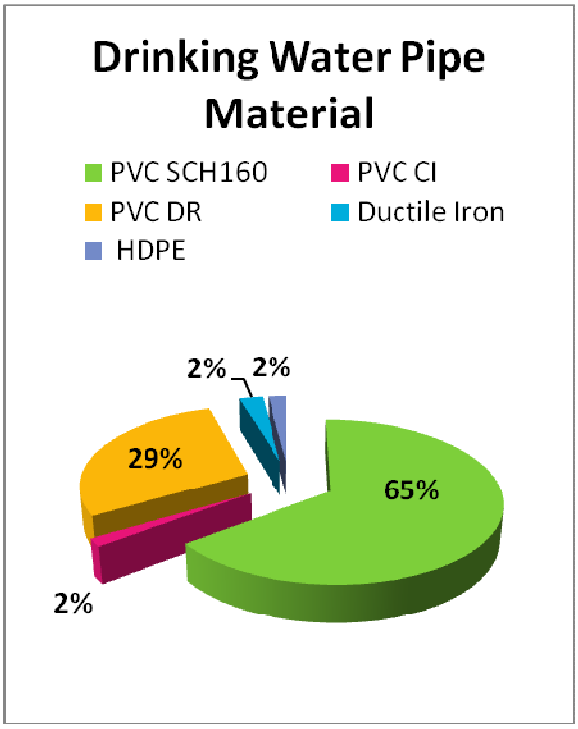
The Municipality's drinking water system consists of a network of pipes, maintenance holes, valves, hydrants, connections, a pumping station, and a chlorination room.

The current inventory is broken down in Figure 2.1. The source of the information is the Asset Inventory Registry.

For analysis, the Municipality relied on internal knowledge of the system, contract documents, and Engineering reports.

Figure 2.1: Drinking Water Inventory Summary

Asset Type	Asset Component	Inventory
Linear	**Local Pipes** 400mm 350mm 300mm 250mm 200mm 150mm	308m 4,433m 40m 1,055m 3,715m 5,366m
	Valves & Chambers	90
	Hydrants	95
	Equipment	13
	Service Connections	343
Facilities	Chlorination Room in Parry Sound Water Tower	1
	Water Dept. Storage & Sampling Structure	1
	Pumping Station Structure	1



2.2 Valuation

The drinking water system services 353 households and was installed in 1988, expanded in 2005 by a private development and expanded once more in 2007 by the Municipality when the latest Parry Sound Water Tower was installed. The historical cost of the drinking water system is shown at 2007 values when the most recent construction was undertaken.

The historical cost is shown without inflation apart from 1988 assets for which no 2007 values were available; these assets have been inflated using CPI figures to 2007 values.

The historical cost of drinking water facilities apart from the Chlorination Room is higher than the replacement cost. This is because McDougall no longer operates an intake facility off of Georgian Bay to supply water to its residents. Instead, McDougall re-chlorinates drinking water from the Parry Sound Water Tower.

The estimated replacement value of the system is based on 2007 values, inflated using CPI figures to 2012 values. The estimated current replacement value (2012) of the drinking water system is $10,994,076 or $31,145 per user in McDougall. Figure 2. 2 shows the breakdown of historical and replacement costs.

2.0 DRINKING WATER SYSTEM

Figure 2.2: Drinking Water System Historical & Replacement Value

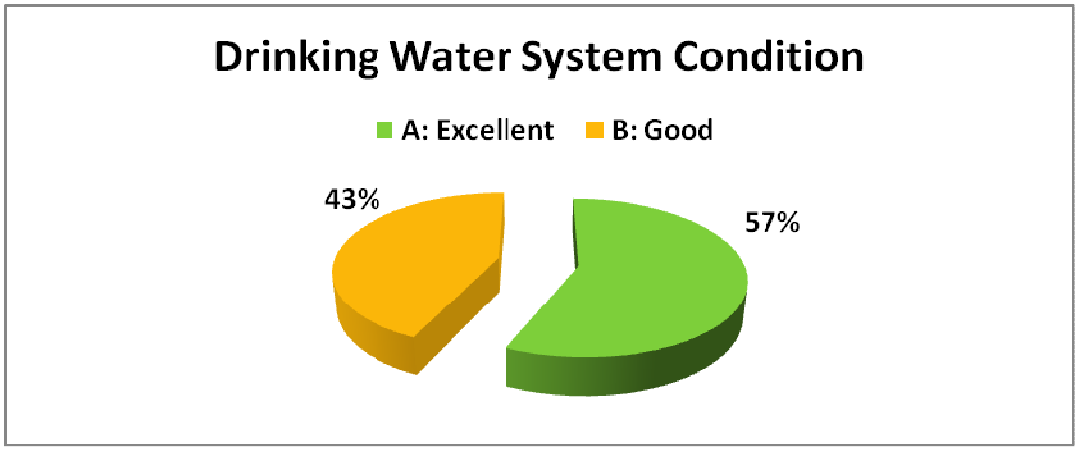
Asset Type	Asset Component	Historical Cost 2007	Replacement Value 2012	Percent of Replacement
Linear	**Local Pipes** 400mm 350mm 300mm 250mm 200mm 150mm	 $508,116 $1,439,469 $14,800 $723,663 $1,260,530 $2,534,220	 $372,801 $1,566,142 $16,102 $787,345 $1,371,174 $2,863,669	 3.4% 14.2% 0.1% 7.2% 12.6% 26.0%
	Valves & Chambers	$940,636	$1,023,412	9.3%
	Hydrants	$253,650	$282,000	2.6%
	Equipment	$39,748	$43,852	0.4%
	Service Connections	$2,294,500	$2,496,416	22.7%
	Value Sub Total	***$10,019,331***	***$10,834,076***	***98.5%***
Facilities	Chlorination Room in Parry Sound Water Tower	$36,200	$40,000	0.4%
	Water Dept. Storage & Sampling	$20,000	$20,000	0.2%
	Pumping Station Structure	$374,812	$100,000	*0.9%*
	Value Sub Total	***$431,012***	***$160,000***	***1.5%***
Total Values		***$10,450,343***	***$10,994,076***	***100%***

2.3 Condition Assessment

The condition report in Figure 2.3 was developed by Municipal Staff with consideration of current legislative requirements, and Engineering reports. The Municipality chose to rely on Municipal Staff and Engineering reports in determining the condition of the system due to the number of external variables and high degree of internal knowledge of the system. Condition assessment criteria are available in the Appendix 1.0.

Figure 2.3: Drinking Water System High Level Condition Assessment

Asset Type	Asset Component	Condition
Linear	**Local Pipes** 400mm 350mm 300mm 250mm 200mm 150mm	 A A A A A A
	Valves & Chambers	B
	Hydrants	A
	Equipment	A
	Service Connections	A
Facilities	Chlorination Room in Parry Sound Water Tower	A
	Water Dept. Storage & Sampling	A
	Pumping Station Structure	A



2.4 Lifecycle Activities

The drinking water assets can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 2.4.

Figure 2.4: Drinking Water System Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: inspections, monitoring, cleaning, flushing, testing, etc.	75-100%
Major Maintenance	Unplanned maintenance & repair: repairing water main breaks, repairing valves, replacing pipes, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: lining pipes, protection in piping, etc.	25 - 50%
Replacement	End of asset life: decommission, remove old asset and install a new asset that does the same job	0 -25 %

2.5 Life Expectancy

There are numerous direct and indirect variables that affect useful lives of water assets such as climate, soil condition, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff and Engineering reports in gauging useful life and life remaining for McDougall's drinking water system.

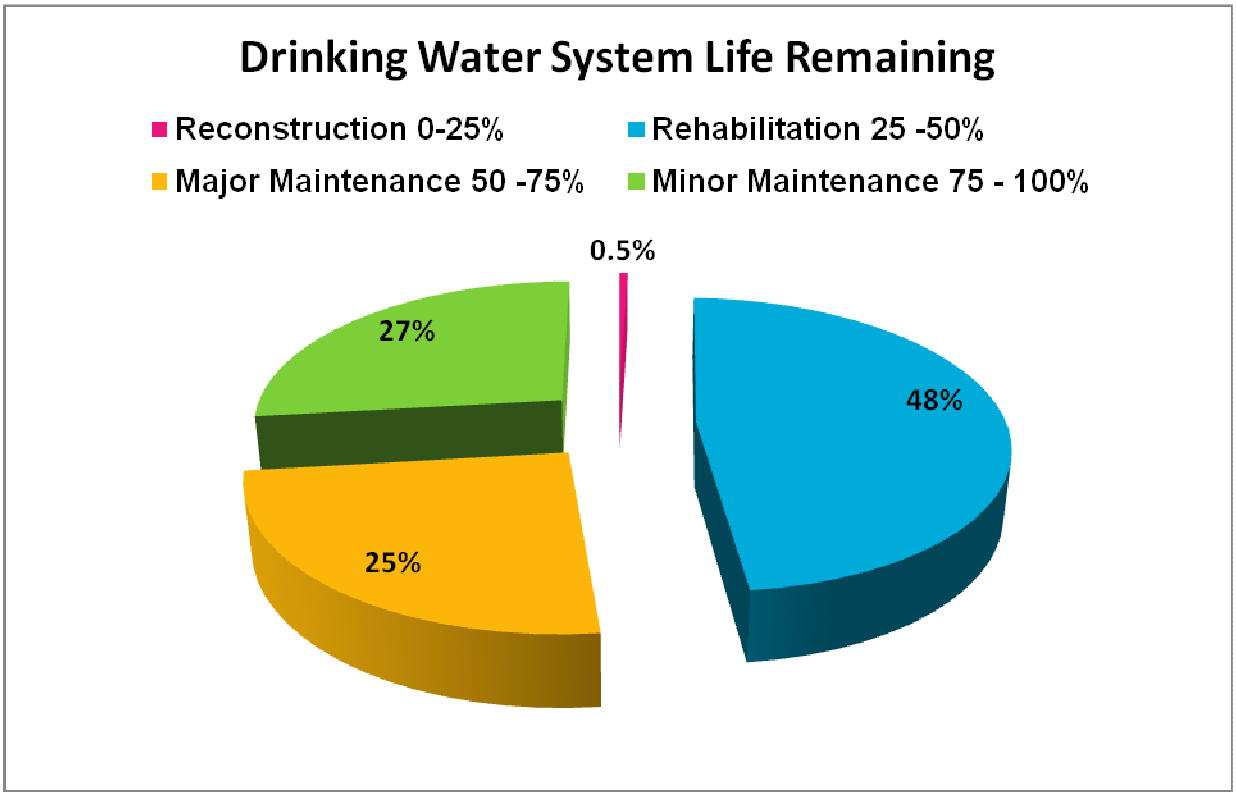
Figure 2.5 shows the useful life of the drinking water assets; Figure 2.6 shows the remaining lives and the lifecycle activities that are being applied.

2.0 DRINKING WATER SYSTEM

Figure 2.5: Drinking Water System Useful Life

Asset Type	Asset Component	Useful Life
Linear	**Local Pipes** 400mm 350mm 300mm 250mm 200mm 150mm	 75 75 75 75 75 75
	Valves & Chambers	50
	Hydrants	50
	Equipment	28
	Service Connections	50
Facilities	Chlorination Room in Parry Sound Water Tower	75
	Water Dept. Storage & Sampling	25
	Pumping Station Structure	75

Figure 2.6: Drinking Water System Remaining Useful Life



DESIRED LEVEL OF SERVICE

2.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 2.7 and 2.8 cover drinking water. These figures identify target levels of service, and current performance relative to measures identified. Future demand drivers, forecasts and effects are discussed in the Asset Management Plan Introduction Section 8.0 and includes all of the assets covered in the plan.

Figure 2.7: Drinking Water Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	Managing the water distribution system in accordance with all applicable legislation.	Number of customer service requests relating to quality/water taste.	0 Customer requests.	5 Customer requests.
Reliability	Provide users with a consistent supply of drinking water.	Number of unexpected interruptions of service.	0 Unexpected interruptions.	0 Unexpected interruptions.
Safety	Provide users with a safe supply of drinking water.	Number of contamination. Number of pipe line breaks per 100km. Repair time after pipe breaks. Customer service request response time.	0 Contamination cases. 0 Pipe line breaks per 100km. No breaks. Completed within 24 hours in 2012.	0 Contamination cases. 0 Pipe line breaks per 100km. 12 hour repair time after pipe breaks. 12 hour response time.
Quality	Maintaining and continually improving the D.W.Q.M.S.	Number of improvements to the D.W.Q.M.S.	3 D.W.Q.M.S. improvements in 2012.	5 D.W.Q.M.S. improvements annually.
Capacity	Providing enough drinking water to residents with water connections and sufficient volume for fire protection.	Number of customer service requests relating to water pressure.	0 Customer service requests relating to water pressure.	5 Customer service requests relating to water pressure.

2.0 DRINKING WATER SYSTEM

Figure 2.8: Drinking Water Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Water quality meets legislative requirements.	Inspections schedule. Water main flushing schedule.	Inspections completed daily. Annual flushing complete in 2012.	Daily inspections (M.O.E. regulation). Annual water main and hydrant flushing (M.O.E. regulation).
Maintenance	Respond to customer service maintenance requests and provide scheduled maintenance.	Work related to customer maintenance requests and scheduled maintenance completion times.	2 Customer service requests. Maintenance & repairs completed within 24 hours after beginning/notice.	3 Customer service requests. Maintenance & repairs completed within 12 hours after beginning/notice.
Renewal	Useful lives of infrastructure should be increasing with the replacement of components.	Infrastructure useful lives.	Average useful life is increasing with renewals. 2012 Average Life: 71%	Infrastructure components are replaced before the end of the asset's lifecycle.
Upgrade/New	Residents and businesses who have access to Municipal water receive a sufficient amount of quality drinking water while maintaining a supply for fire protection.	Provision of water infrastructure to users who are eligible.	All users with Municipal water access have enough quality water. There is an ample amount of water for fire protection.	All users with Municipal water access have enough quality water. There is an ample amount of water for fire protection.

ASSET MANAGEMENT STRATEGY

2.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Figure 2.9 identifies critical assets in the drinking water system. Drinking water system risks are further explored in the Appendix 4.0.

Figure 2.9: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Chlorination Room	Treat drinking water to legislated levels.	Untreated drinking water discharge, contamination and service disruption
2	Distribution Network	Distribute quality drinking water throughout the system.	Untreated drinking water discharge, contamination, service disruption.
3	Hydrants	Facilitate firefighting efforts.	Inability to efficiently fight fire.

2.8 Maintenance & Operations Plan

Maintenance Activities: include all actions necessary for keeping assets at their operable capacity. These actions were previous discussed in Figure 2.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining figure in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities affect service levels as they determine day to day servicing of the drinking water system. These activities determine waste water quality, life of equipment, etc.

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Environment Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Maintaining service risk and mitigation strategy database.
- Undertaking capital activities through a planned replacement and renewal system**.**

2.9 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 2.10 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 2.10: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Total value represents the highest net value to Municipality	10%
Has highest age relative to assets in group	10%
Has high operational or maintenance costs	10%
Replacement cost is less than maintenance and/or operating cost	10%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

2.10 Disposal Plan

Disposal includes any activity associated with removing a decommissioned asset from the Municipality. These activities include sale, demolition or relocation to another department. Only pumping equipment assets have been identified in this AM Plan as requiring disposal. The following procedures are followed by the Municipality when disposing of assets.

Surplus capital assets will be disposed of in the following manner:

- Disposals will be authorized by C.A.O and Management Staff
- Competitive bid process through a Request for Quotations
- Public auction
- Trade-In

Invitations to bid on capital assets offered for sale by the Municipality will be:

- Posted on the Municipality's website for at least 14 days before the closing date of the invitation to bid
- Published in at least one edition of the local newspapers

2.11 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

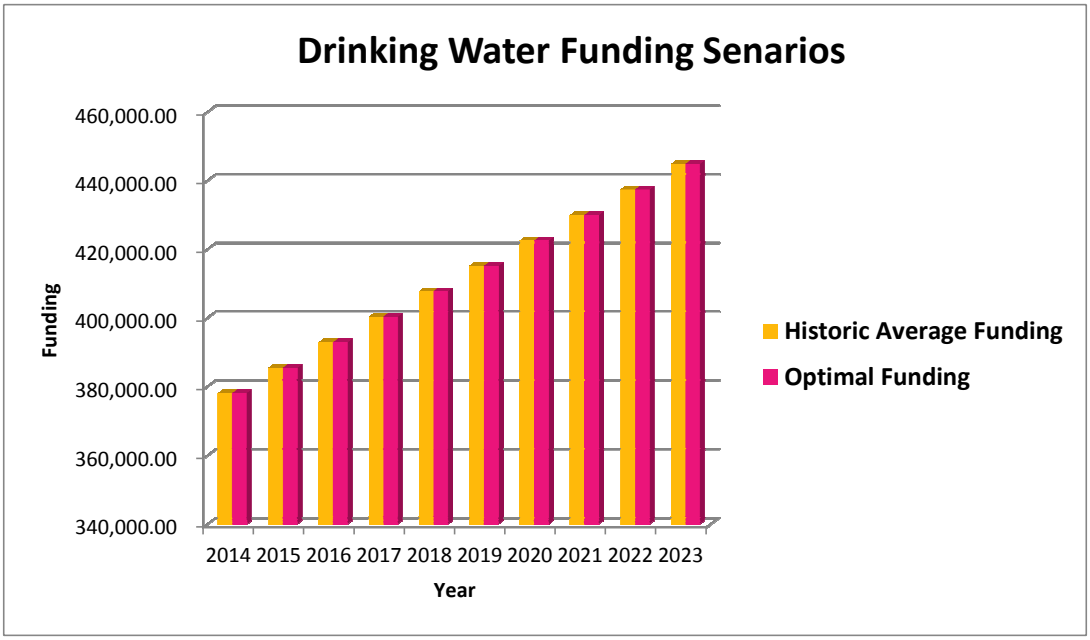
2.12 Risks Involved with the Plan

Optimal Capital Funding vs. Budgeted Capital Funding

The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the historic average spending and revenue compared against additional future needs. Since average revenue over the last three years covers all projected expenditures for the next 10 years, historic average funding is optimal funding.

Scenario 1: Optimal funding for all drinking water system expenditure over the next 10 years is $4,114,362 including inflation of 2% annually. Based on 10 years, a budget of $411,436 would be required annually for optimal operating, reserve building, capital renewal and replacement.

Figure 2.11: Optimal vs. Budgeted Funding Strategies



What McDougall Cannot Do

The Municipality is able to allocate and generate the funding required annually to sustain the drinking water system. This funding provides for all operations, renewals and capital reserve building (Scenario 1). McDougall is able to fund the system and there are no gaps.

Service Consequences

Asset lifecycle activities that the Municipality decides not to undertake after consideration of the asset hierarchy, planned maintenance strategy and replace/renewal ranking guide may impact users' service experience. These consequences are explored in Figure 2.12.

Figure 2.12: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o More minor repair work for Municipal Staff o Stress on resources o Reactive maintenance	o Regular inspections of minor assets
The Municipality will only stock basic replacement parts for critical assets.	o Long wait times for replacement parts o Service interruptions	o Routine preventative maintenance on minor assets in poor condition o Scheduled maintenance on minor assets
Drinking water assets will continue to deteriorate and they will only be repaired or replaced when breakage occurs despite planning due to financial constraint.	o Stress on resources o Service interruption o Reactive maintenance o Possible contamination	o Identification and monitoring of assets in poor condition

2.0 DRINKING WATER SYSTEM

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous subsections. For data confidence information see Appendix 3.0.

2.13 Ten year Drinking Water System Expenditure Projections

The expenditure forecast for the next 10 years is shown in Figure 2.13. It includes projections for non infrastructure solutions, operating, renewal, reserve building, and maintenance activities. Note that all costs are shown with 2% annual inflation on 2010-2012 spending averages.

The total renewal and maintenance expenditure excluding asset replacement reserve contributions is $166,504 or $472 per user over the next 10 years. If reserve contributions are included the total, it rises to $596,620 or $1,690 over 10 years. Note neither of these totals include operating expense which is projected to be between $320,000 and $390,000 annually.

For comparative purposes Figure 2.8 shows drinking water expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure 2.13: Projected Operating & Capital Expenditure

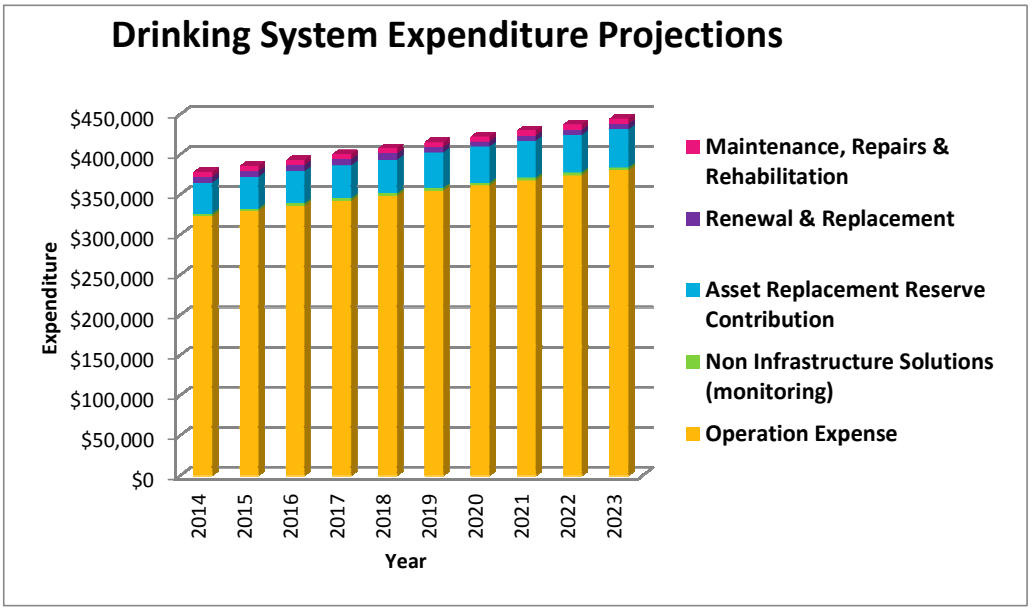
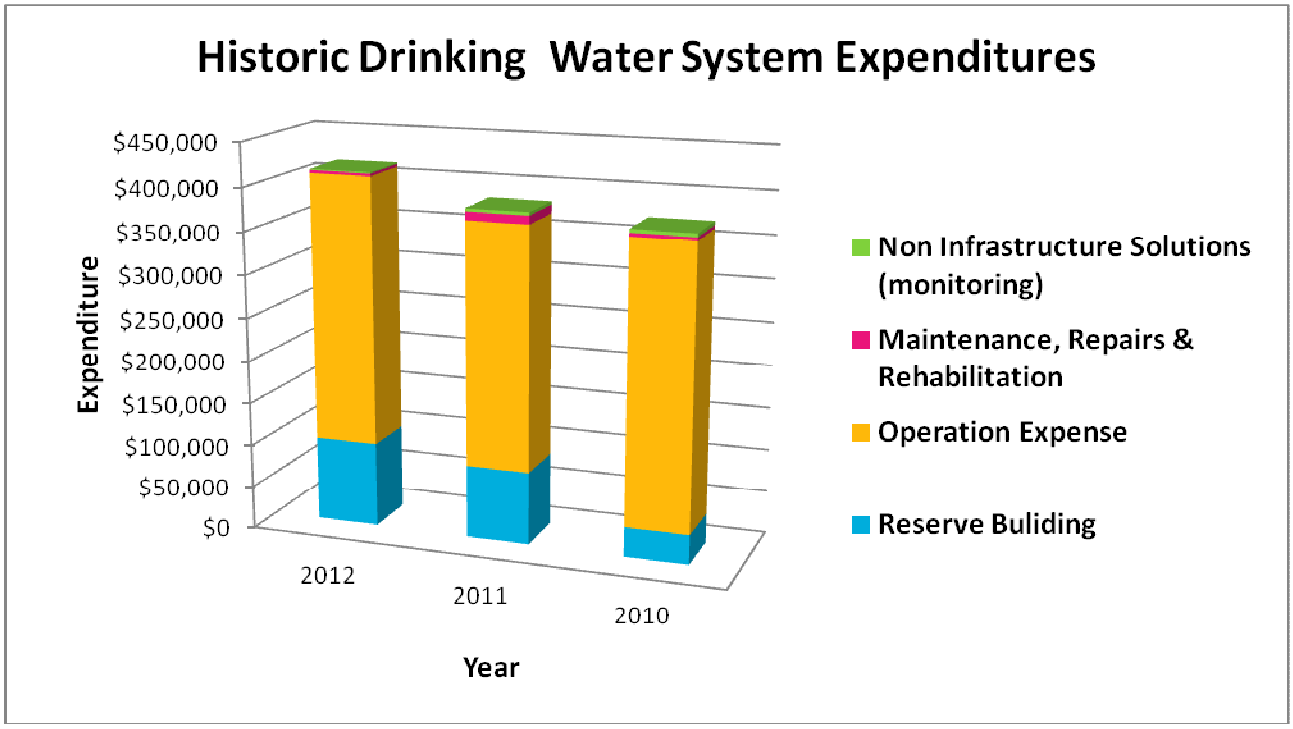


Figure 2.14: Historical Drinking Water System Expenditures



Over the last three years the Municipality has not replaced or renewed any major drinking water assets. Instead the Municipality has focused on reserve building. Going forward there are projected replacements and renewals beginning in 2017 as asset conditions continue to deteriorate. These renewals are mainly minor assets such as pumping equipment and building repairs and total $ 72,324 over the 10 years (includes inflation). Looking towards the next 20 years a series of major asset lives come up for renewal namely hydrants and service connections, further resources will be required and reserve building is important to ensure financial sustainability in the future.

2.14 Ten year Drinking Water System Funding Projections

The funding forecast for the next 10 years is shown in Figure 2.15. Funding requirements cover all renewal, maintenance, and operating expenses. Note that all revenue projections are shown with 2% annual inflation on 2010-2012 values.

Figure 2.15: Drinking Water System Funding Projections

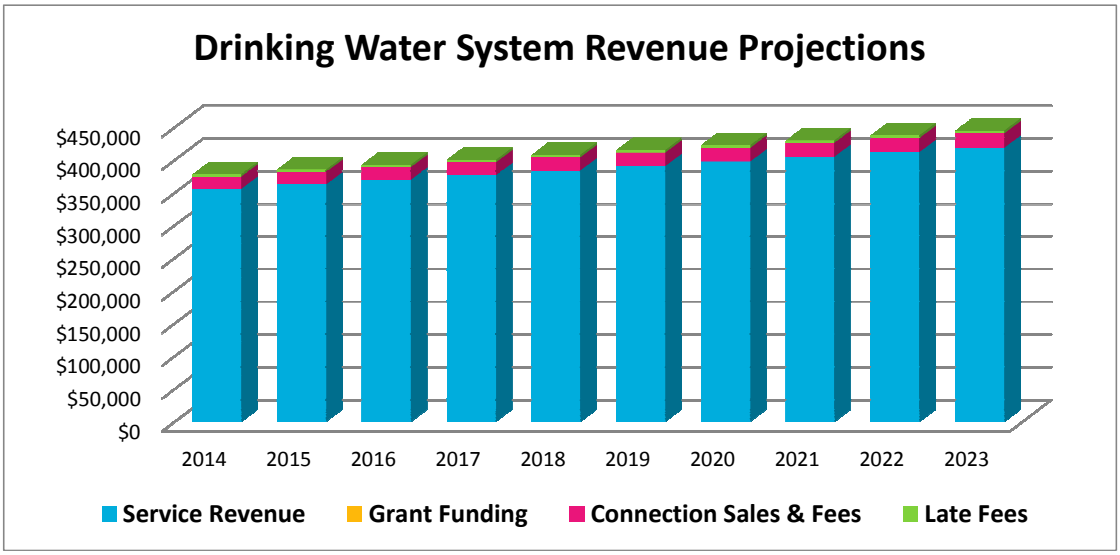
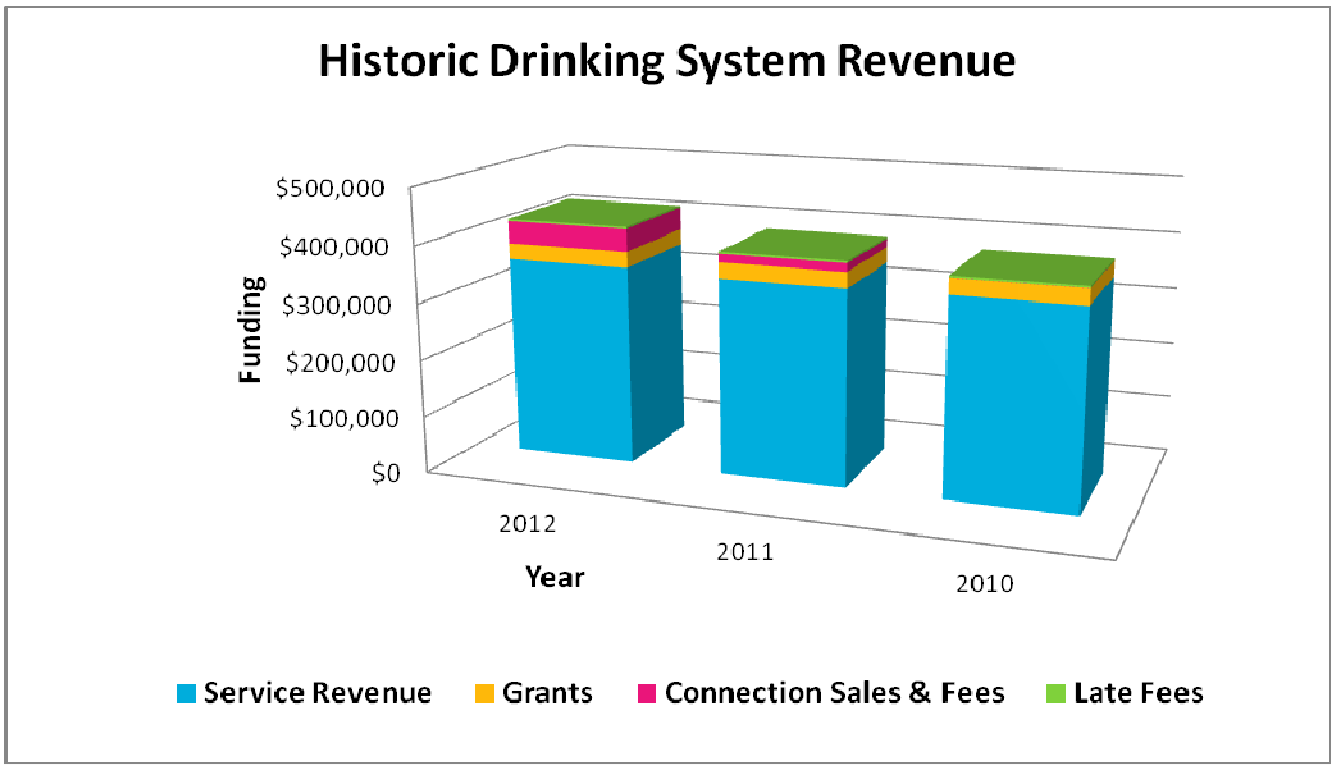


Figure 2.16: Historical Drinking Water System Revenue



2.0 DRINKING WATER SYSTEM

2.15 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the drinking water system Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio 100%

The ratio above indicates that all renewals are fully funded for the next 10 years with the Asset Management Plan in place. There is no infrastructure gap.

APPENDIX
1.0 CONDITION ASSESSMENT CRITERIA

Condition		
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required	Normal PM
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required	Normal PM + Minor M.
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended.	Normal PM + Major M.
D	**Critical:** Extensive deterioration, barely functional. Immediate action required	Major Repair + Rehab.
F	**Failed:** No longer functioning. Immediate action required	Rehab. Unlikely = Replace

Capacity	
A	System can support over 100% of demand
B	System can support over 90-99% of demand
C	System can support over 80-89% of demand
D	System can support over 70-79% of demand
F	System can support less than 70% of demand

Performance	
A	Exceeds / Meets all Performance Targets
B	Minor Performance Deficiencies
C	Considerable Performance Deficiencies
D	Major Performance Deficiencies
F	Does not meet any Performance Targets

Reliability		
A	As Specified by Manufacturer	Never Failed
B	Random Breakdown	Fails every 20 Years
C	Occasional Breakdown	Fails every 5 Years
D	Periodic Breakdown	Falls every 2 Years
F	Continuous Breakdown	Fails Annually

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or not the service valuable to the public.

These performance measures include:

Purpose: Does the service satisfy users' needs?

Reliability: Does the service have the capability to maintain its functions on a routine basis?

Safety: Are the users protected from potential risks associated with the service?

Quality: Does the service fulfill its purpose to a high degree of excellence?

Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.

2.0 DRINKING WATER SYSTEM

These activities affect the annual operating budget as the following performance measures:

Operations: routine activities that provide the service.

Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.

Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Operation Expenditure	A	Based on actual spending records. Consideration given to historical records.
Maintenance Expenditure	A	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from asset registry, Municipal Water Works Staff recommendations and industry standards
Asset Useful Lives	B	Based on Municipal Water Works Staff recommendations and industry standards

4.0 D.W.Q.M.S. RISK ASSESSMENT MATRIX

Date of Assessment: Sept/28/2011
Risk Assessment Team: Bruce Butler, Steve Goman, Tim Hunt

DWQMS Risk Threshold: RPN ≥ 10

Recognize						Assess				Control			
Element or Process Step						Risk Evaluation							
#	Process Category	Description of Process	Hazardous Event	Potential Hazard	Current Available Control Measures	Likelihood (1-5)	Severity (1-5)	Detectability (1-5)	Assessed Risk (L + S + D = 1 to 15)	CCP? Yes / No	Critical Control Limits (qualitative or quantitative; use appropriate units)	Relevant Procedures	Potential Additional Controls
1	Upstream Transmission	Upstream Water Quality from Town of Parry Sound (Tower)	Inadequate disinfection active pathogens	Biological contamination of water - Adverse Water Quality Incident	Under Town's control: Town is required to report any known water quality issues to the Municipality (Resolution 2005/588, sections 7 & 18) Booster chlorination at the tower Town controls in place	3	3	1	7	No - outside Municipal Control	—	—	Continuious review of procedure with Town to ensure smooth response and understanding.
2	Upstream Transmission	Upstream Water Quality from Town of Parry Sound (Tower)	Inadequate chlorine residual	Biological contamination of water	Booster chlorination at the tower Online monitoring of chlorine residual - pump moderates itself to set point. SCADA monitoring available at Tower - alarms to Town system & dialer calls Municipality	1	2	1	4	Yes	Rechlorination monitored and adjusted to maintain chlorine residual as per O. Reg. 169/ O. Reg. 170	*PW-DW-SOP-012-006*, "Continuous Monitoring of Residual Chlorine"	None.
3	Upstream Transmission	Upstream Water from Town of Parry Sound through Feeder Main to North Tower	Break in Feeder Main to North Tower	Insufficient supply of consumable water	1 week Municipal supply of water held within Tower New Town watermain (approx 90% installed since 2007) Backflow prevention on Town side of line	2	3	1	6	No	—	—	Continue to review with town to improve for emergency response procedure to respond to feeder main breaks (with links to Town as required)
4	Upstream Transmission	Upstream Water from Town of Parry Sound through Feeder Main to North Tower	Break in Feeder Main to North Tower	Insufficient supply of water - fire flows	6-8 hours' worth of water held within Tower (assuming two hydrants flowing) Pumper trucks would be used - lots of non-potable water sources in the area New Town watermain (approx 90% installed since) Back-check on Town side of line	2	3	1	6	No	—	—	Continue to review with town to improve for emergency response procedure to respond to feeder main breaks (with links to Town as required)
5	Upstream Storage	Stored Water - Elevated Tower	Animal Intrusion / Sabotage	Chemical contamination or physical damage to infrastructure	Town controls security at Tower Intrusion/SCADA alarms (Town - Tower; McDougall - pumping room) Double-gated	1	5	5	11	No - outside Municipal Control	—	—	None.

DWQMS Risk Threshold: RPN ≥ 10

Recognize						Assess				Control			
Element or Process Step						Risk Evaluation							
#	Process Category	Description of Process	Hazardous Event	Potential Hazard	Current Available Control Measures	Likelihood (1-5)	Severity (1-5)	Detectability (1-5)	Assessed Risk (L + S + D = 1 to 15)	CCP? Yes / No	Critical Control Limits (qualitative or quantitative; use appropriate units)	Relevant Procedures	Potential Additional Controls
6	Upstream Storage	Stored Water - Elevated Tower	Animal Intrusion / Sabotage	Biological contamination	Town controls security at Tower: intrusion/SCADA alarms (Town - Tower; McDougall - pumping room), double-gated Rechlorination station	1	5	5	11	Yes	Rechlorination monitored and adjusted to maintain chlorine residual as per O. Reg. 169/ O. Reg. 170	***PW-DW-SOP-012-006***, "Continuous Monitoring of Residual Chlorine"; applicable Town of Parry Sound procedures	None.
7	Booster Chlorination (Municipal)	Booster Chlorination facility	Malfunction of Booster Chlorination Station	Biological contamination of water - Adverse Water Quality incident	Preventive maintenance for equipment as per manual SCADA & alarming Calibration as required - check of analyzer once weekly Two pumps - redundancy of equipment One injection point	1	1	1	3	Yes	SCADA monitoring of booster station in place	***PW-DW-SOP-012-006***, "Continuous Monitoring of Residual Chlorine"; ***PW-DW-SOP-013-002***, "Calibration of Continuous Chlorine Analyzer"	Develop Template for monitoring of hypochlorite levels in storage tank to be recorded during weekly checks.
8	Distribution (Municipal)	Watermain - distribution, infrastructure	General physical failure of watermains due to aging, deterioration	Insufficient supply (all purposes)	Distribution system infrastructure all installed since 1988 Corrosion control on newer infrastructure. Infrastructure review conducted once annually. Asset management program being developed..	2	2	3	7	No	—	—	None.
9	Distribution (Municipal)	Watermain - distribution, infrastructure	Physical failure of feeder watermain (from Tower) due to aging, deterioration	Insufficient supply (all purposes)	Feeder watermain is 2 years old PVC construction; wrapped; anodes on bolts Infrastructure review conducted once annually. Asset management program being developed..	1	5	1	7	No	—	—	None.

*DWQMS Risk Threshold: **RPN** ≥ 10*

Recognize						Assess				Control			
Element or Process Step						Risk Evaluation							
#	Process Category	Description of Process	Hazardous Event	Potential Hazard	Current Available Control Measures	Likelihood (1-5)	Severity (1-5)	Detectability (1-5)	Assessed Risk (L + S + D = 1 to 15)	CCP? Yes / No	Critical Control Limits (qualitative or quantitative; use appropriate units)	Relevant Procedures	Potential Additional Controls
10	Distribution (Municipal)	Watermain - distribution, infrastructure	Biological contamination occurring during regular operations - i.e. biofilms	Biological contamination of water - Adverse Water Quality Incident	Booster chlorination at the Tower Weekly bacteriological monitoring of system Flushing program in place	1	2	2	5	Yes	Rechlorination monitored and adjusted to maintain chlorine residual as per O. Reg. 169/ O. Reg. 170	***PW-DW-SOP-011-002,*** "Flushing Procedure for Distribution System"; ***PW-DW-SOP-012-002***, "Taking Bacteriological Samples"; ***PW-DW-SOP-012-006***, "Continuous Monitoring of Residual Chlorine"	None.
11	Distribution (Municipal)	Watermain - distribution, infrastructure	General chemical/physical contamination - i.e. iron, manganese, turbidity, etc.	Chemical contamination of water	PVC infrastructure installed. Increased sampling for THMs (monthly) - at Municipality's discretion No Schedule 23/24 sampling requirement	1	2	3	6	No	---	---	None.
12	Distribution (Municipal)	Watermain - distribution, infrastructure	Lead contamination (chemical)	Chemical contamination of water	Sampling program in place No lead infrastructure in Municipal system.	1	2	2	5	No	—	—	None.
13	Distribution (Municipal)	Watermain - commissioning of new watermains	Contamination of water new connections to distribution system	Biological contamination of water - Adverse Water Quality Incident	All contractor work supervised by Municipal staff or on-site engineer - good control over commissioning operations.	1	3	1	5	Yes	Sampling program for new watermains: limits as per AWWA Standard C651	***PW-DW-SOP-011-001,*** "New Watermain Disinfection"; ***PW-DW-SOP-012-002,*** "Taking Bacteriological Samples"	
14	Distribution (Municipal)	Cross-connections & backflows - all services	Cross-connections and/or backflows in Municipal distribution system	Biological or chemical cross-contamination of water	Backflow bylaw in place (2003): any new connection (including residential) has to have a backflow prevention device Vulnerability with grandfathered installations - bylaw covers about 5% of existing buildings No periodic inspection required	2	3	5	10	Yes	Backflow bylaw in place	***Bylaw #2005-16:*** Section 9.15 (backflow prevention)	Implement backflow unit inspection requirement for higher-volume water users.

DWQMS Risk Threshold: RPN ≥ 10

Recognize						Assess				Control			
Element or Process Step						Risk Evaluation							
#	Process Category	Description of Process	Hazardous Event	Potential Hazard	Current Available Control Measures	Likelihood (1-5)	Severity (1-5)	Detectability (1-5)	Assessed Risk (L + S + D = 1 to 15)	CCP? Yes / No	Critical Control Limits (qualitative or quantitative; use appropriate units)	Relevant Procedures	Potential Additional Controls
15	Distribution (Municipal)	Dead ends	Stagnant water - low chlorine residuals, bacterial regrowth	Biological contamination of water - Adverse Water Quality incident	Flushing program in place Sampling program in place	2	2	2	6	Yes	Rechlorination monitored and adjusted to maintain chlorine residual as per O. Reg. 169/ O. Reg. 170	***PW-DW-SOP-011-002,*** "Flushing Procedure for Distribution System"; ***PW-DW-SOP-012-002,*** "Taking Bacteriological Samples"	None.
16	Distribution (Municipal)	Watermain - distribution, infrastructure	Physical failure of watermain	Biological contamination of water - Adverse Water Quality incident	Distribution system infrastructure from 1988 Corrosion control on joints in some areas SCADA monitoring in place - trend analysis of flows Sampling programs in place	2	3	2	7	Yes	As per O. Reg. 169/ O. Reg. 170	***PW-DW-SOP-012-002,*** "Taking Bacteriological Samples"; ***PW-DW-SOP-012-005,*** "Manual Determination of Residual Chlorine"	None.
17	Distribution (Municipal)	Fire hydrant performance	Malfunction of hydrants (leaks, freezing etc)	Water loss, loss of pressure for fire flows	Pumper trucks available (filled off hydrant) Hydrant inspection program (tied in with flushing program) Known issues with hydrants are typically resolved within 1 week Hydrants checked more frequently in winter	3	1	3	7	No	—	—	None.
18	Distribution (Municipal)	Customer linkages - private connections	Cross-contamination and/or backflow private connections	Biological or chemical contamination of water	Bylaws provide Municipality with ability to turn off customer water supply until issues are brought into compliance.	2	3	3	8	Yes	Backflow bylaw in place	***Bylaw #2005-16:*** Section 9.15 (backflow prevention)	None.
19	Distribution (Municipal)	Water delivery system - Public-use water tap	Failure of back-flow prevention devices	Biological or chemical contamination of water	Backflow preventer on tap Backflow prevention on main (redundancy) Solenoid-activated flow - button must be pressed for flow	1	2	4	7	Yes	Backflow bylaw in place	***Bylaw #2005-16:*** Section 9.15 (backflow prevention)	None.

DWQMS Risk Threshold: ***RPN*** **≥ 10**

Recognize						Assess				Control			
Element or Process Step						Risk Evaluation							
#	Process Category	Description of Process	Hazardous Event	Potential Hazard	Current Available Control Measures	Likelihood (1-5)	Severity (1-5)	Detectability (1-5)	Assessed Risk (L + S + D = 1 to 15)	CCP? Yes / No	Critical Control Limits (qualitative or quantitative; use appropriate units)	Relevant Procedures	Potential Additional Controls
20	Distribution (Private)	Water delivery system - Water Station - Unauthorized hauling station	Failure of or lack of back-flow prevention devices	Biological or chemical contamination of water	No control measures in place.	2	5	5	12	No - outside Municipal Control	—	***Bylaw #2005-16:*** Section 3.3 (Offences)	
21	Distribution (Private - downstream)	Customer elements - customer system issues	Lead in private service systems (pipes, welds)	Chemical contamination of water (lead)	Sampling program in place. Some observed lead in customer elements.	2	1	2	5	No - outside Municipal Control	—	—	Education programs for public - work with Public Health as required.

2.0 DRINKING WATER SYSTEM

5.0 FUNDING SCENARIOS – OPTIMAL VS. HISTORIC AVERAGE

2012 Drinking Water Financing	*Scenario One - Optimal & Historic Funding*										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Service Revenue	355,732	362,707	369,682	376,658	383,633	390,608	397,583	404,558	411,533	418,508	425,484
Grants											
Increase Development Fees %											
Increase Service Fees %											
USER											
Connection Sales & Fees	18,682	19,048	19,415	19,781	20,147	20,513	20,880	21,246	21,612	21,979	22,345
Late Fees	3,663	3,734	3,806	3,878	3,950	4,022	4,093	4,165	4,237	4,309	4,381
TOTAL REVENUE	**378,077**	**385,490**	**392,903**	**400,316**	**407,730**	**415,143**	**422,556**	**429,969**	**437,383**	**444,796**	**452,209**
OPERATION EXPENSE											
Annual Operation Expense	314,271	320,433	326,595	332,757	338,920	345,082	351,244	357,406	363,568	369,731	375,893
Vehicle Overhead	8,981	9,157	9,333	9,509	9,685	9,862	10,038	10,214	10,390	10,566	10,742
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal & Replacement	7,344	7,488	7,632	7,776	7,920	6,160	6,270	6,380	6,490	6,600	7,564
Maintenance, Repairs & Rehabilitation	5,776	5,889	6,003	6,116	6,229	6,342	6,456	6,569	6,682	6,795	6,909
Non Infrastructure Solutions (monitoring)	3,086	3,147	3,207	3,268	3,328	3,389	3,449	3,510	3,570	3,631	3,691
Disposal Activities											
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution	38,618	39,375	40,133	40,890	41,647	44,308	45,099	45,891	46,682	47,473	47,410
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve	461,543	500,161	539,536	579,669	620,558	662,205	706,513	751,613	797,504	844,185	891,659
TOTAL EXPENSE	**378,077**	**385,490**	**392,903**	**400,316**	**407,730**	**415,143**	**422,556**	**429,969**	**437,383**	**444,796**	**452,209**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

*** All figures shown in CAD $**
****Inflation assumption is 2 %**

***** Forecasted revenues & expenditures are based on 2010 - 2012 actual spending (average)**

6.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM

Asset Component	Quantity	Unit	Useful Life	Life Remaining	2019 Renewals	2024 Renewals
Water Pumping Station - repairs	1	each	75	67%	$ 5,000	
Water Dept. Storage & Sampling - repairs	1	each	25	23%		$ 20,000
Chemical metering pumps	2	each	10	40%	$ 6,000	
Continuous Free Chlorine Residual Analyzer	2	each	15	60%		$ 7,500
Alarm System complete with SCADA	3	each	10	40%	$ 25,000	
				Total Program	**$ 36,000**	**$ 27,500**

Municipality of McDougall

3.0 Waste Water System

Asset Management Plan

December 2013

3.0 WASTE WATER SYSTEM

Contents

3.0 WASTE WATER SYSTEM

3.0 WASTE WATER SYSTEM

STATE OF INFRASTRUCTURE

3.1 Inventory

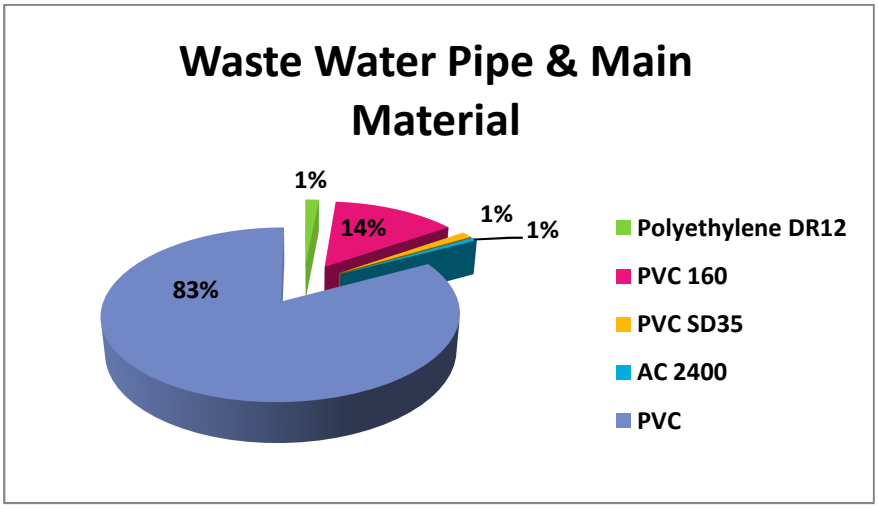
The Municipality's waste water system is a septic bed and consists of a network of force mains and pipes, maintenance holes, valves, a pumping station and a storage tank.

The current inventory is broken down in Figure 3.1. The source of the information is the Asset Inventory Registry.

For analysis, the Municipality relied on internal knowledge of the system, contract documents, and Engineering reports.

Figure 3.1: Waste Water Inventory Summary

Asset Type	Asset Component	2012 Inventory
Linear	**Force mains** 50mm 100mm	 55m 500m
	Local Sewers 100mm 200mm	 3,000m 69m
	Maintenance Holes	15
	Pumping Station Equipment	42
Facilities	Pumping Station Structures	1
	Storage Tanks	1



3.0 WASTE WATER SYSTEM

3.2 Valuation

The waste water system was installed in 1988 as a septic bed for 27 households. From 2001 to 2002, the existing septic bed was re-piped, the distribution lines, distribution boxes and force mains were replaced by installing new lines between the old lines. In 2002, the sanitary collection system was repaired reducing the flows to the system which extended its life and repaired it.

The historical cost of the waste water system is shown at 2002 values when the last construction was done on the system. The historical cost is shown without inflation apart from 1982 assets for which no 2002 or 2013 value was available; these assets have been inflated using CPI values to 2002 values. In some cases replacement value is less than historical value because the historical figure includes renewal and maintenance work such as lining the pipes; activities that will not be repeated in the future.

The estimated replacement value of the system is based on 2002 and inflated using CPI figures to 2012 values. Quoted 2013 values were also used for the assets that are targeted for renewal in the next 5 years.

The estimated current replacement value (2013) of the waste water system is $641,315 or $23,752 per waste water user in McDougall. This value does not include any auxiliary costs such as disposal of the old assets, Engineering, etc. this type of information can be found in the Financial Strategy Section 3.12. Figure 3.2 below shows the breakdown of historical and replacement costs.

Figure 3.2: Waste Water System Historical & Replacement Value

Asset Type	Asset Component	Historical Cost 2002	Replacement Value 2013	Percent of Replacement
Linear	**Force mains** 50mm 100mm	 $2,000 $3,158	 not being replaced $2,000	 0.0% 0.3%
	Local Sewers 100mm 200mm	$68,075 $139,420	$91,832 $25,460	14.3% 4.0%
	Maintenance Holes	$23,670	$28,357	4.4%
	Pumping Station Equipment	$244,718	$435,709	67.9%
	Value Sub Total	***$481,041***	***$583,357***	***90.9%***
Facilities	Pumping Station Structures	$60,000	$39,475	6.2%
	Storage Tanks	$15,150	$18,483	2.9%
	Value Sub Total	***$75,150***	***$57,958***	***9.1%***
Total Value		***$556,191***	***$641,315***	***100%***

3.0 WASTE WATER SYSTEM

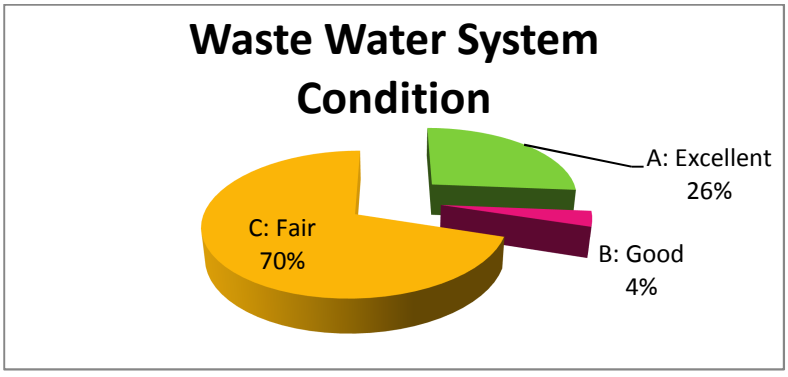
3.3 Condition Assessment

The condition report in Figure 3.3 was developed by Municipal Staff with consideration of current legislative requirements, and Engineering reports. The Municipality chose to rely on Municipal Staff and Engineering reports in determining the condition of the system due to the number of environmental variables and high degree of internal knowledge of the system. Condition assessment criteria are available in the Appendix 1.0.

Overall condition of the infrastructure is fair, some system components are older and in worse condition than others. Principally 2438m of pipe, septic sand and 100m of force main are in need of replacement as their useful life was exceeded in 2012. The Municipality will continue to operate an intensive monitoring program to ensure that the system is operating adequately and meeting service standards for the next 10 years

Figure 3.3: Waste Water System High Level Condition Assessment

Asset Type	Asset Component	Condition
Linear	**Force mains** 50mm 100mm	 A C
	Local Sewers 100mm 200mm	 A B
	Maintenance Holes	A
	Pumping Station Equipment	B
Facilities	Pumping Station Structures	A
	Storage Tanks	B



3.0 WASTE WATER SYSTEM

3.4 Lifecycle Activities

The waste water assets can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 3.4.

Figure 3.4: Waste Water System Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: inspections, monitoring, cleaning, testing, etc.	75-100%
Major Maintenance	Unplanned maintenance & repair: repairing water main breaks, repairing pumps, replacing pipes, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: lining pipes, protection in piping, upgrading pumps, etc.	25 - 50%
Replacement	End of asset life: removal of old asset and install of a new asset that does the same job	0 -25 %

3.5 Life Expectancy

There are numerous direct and indirect variables that affect useful lives of water assets such as climate, soil condition, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff and Engineering reports in gauging useful life and life remaining for McDougall's waste water system.

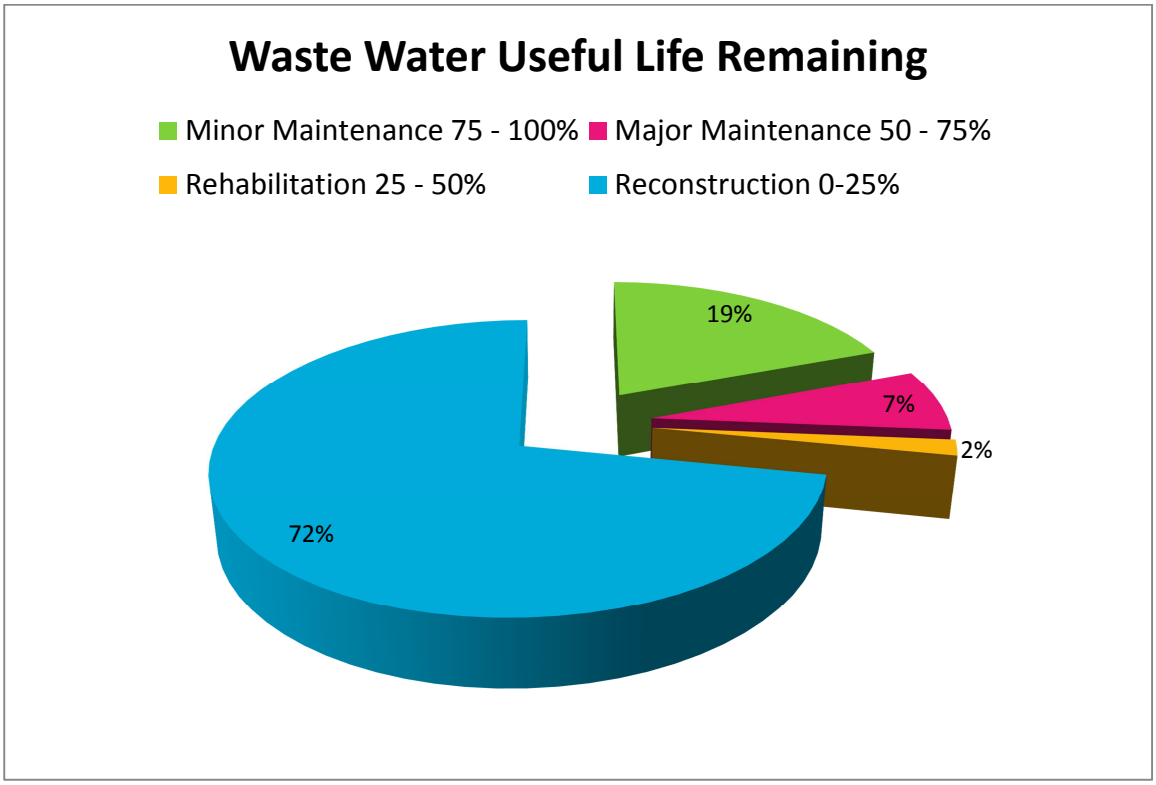
Figure 3.5 shows the useful life of the waste water assets; Figure 3.6 shows the remaining lives and the lifecycle activities that are being applied.

3.0 WASTE WATER SYSTEM

Figure 3.5: Waste Water System Useful Life

Asset Type	Asset Component	Useful Life
Linear	**Force mains** 50mm 100mm	 50 30
	Local Sewers 100mm 200mm	 60 52
	Maintenance Holes	75
	Pumping Station Equipment	42
Facilities	Pumping Station Structures	75
	Storage Tanks	50

Figure 3.6: Waste Water System Remaining Useful Life



3.0 WASTE WATER SYSTEM

DESIRED LEVEL OF SERVICE DESIRED LEVEL OF SERVICE

3.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 3.7 and 3.8 below cover both leachate and sanitary waste (waste water) and were previously discussed in Section 1.6. These Figures identify target levels of service, and current performance relative to the measures identified. Future demand drivers, forecasts and effects were discussed in the Asset Management Plan Introduction Section 8.0 which includes all assets covered in the plan. Levels of service definitions are available in the Appendix 2.0.

3.0 WASTE WATER SYSTEM

Figure 3.7: Waste Water Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	Waste and leachate water is collected, treated and disposed of in accordance with all applicable legislation.	Number of contamination cases.	0 Contamination cases.	0 Contamination cases.
Reliability	Minimize equipment failure and blockages in piping.	Number of equipment failures Number of blockages.	0 Equipment failures. 0 Blockages.	0 Equipment failures. 0 Blockages.
Safety	Provide users with a safe collection of waste and leachate water.	Number of pipe line breaks per 100km. Repair time after pipe breaks. Customer service request response time.	0 Pipe line breaks per 100km. No breaks. Completed within 24 hours in 2012	0 Pipe line breaks per 100km. 12 hour repair time after pipe breaks. 12 hour response time.
Quality	Waste and leachate water system is operating effectively.	Number of customer service requests regarding quality of collection.	0 Customer service requests regarding quality of collection.	1 Customer service requests regarding quality collection.
Capacity	Supply enough piping and mains for collecting and expelling leachate and waste water.	Occurrences of inflow and filtration volumes surpassing limits. Number of backups.	0 Inflow and filtration incidents. 0 Backups.	0 Inflow and filtration incidents. 0 Backups.

3.0 WASTE WATER SYSTEM

Figure 3.8: Waste Water Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Waste and leachate water is treated in accordance with legislated standards.	Number of inspections. Waste and leachate water flushing and cleanings.	All inspections and sampling completed daily. 2012 flushing and cleanings completed.	Daily inspections and samplings (M.O.E. regulation). Annual flushing and cleaning (M.O.E. regulation).
Maintenance	Respond to customer service requests and provide scheduled maintenance.	Work related to customer requests and scheduled maintenance completion times.	All maintenance completed within 24 hours of beginning/notice.	All maintenance completed within 12 hours of beginning/notice.
Renewal	Useful lives of infrastructure should be increasing with the replacement of components.	Infrastructure useful lives.	Average useful life is increasing with renewals. Average Asset Life: Waste Water: 54% Leachate Water: 67%	Infrastructure components are replaced before the end of the assets' lifecycle.
Upgrade/New	M.O.E. does not permit McDougall to add any users to the Septic System; deemed at capacity. Wastewater treatment assets at the landfill meet solid waste inflow.	Capacity of the Leachate collection assets.	Leachate collection assets exceed inflow.	Wastewater treatment infrastructure at the landfill is sufficient for amount of solid waste.

3.0 WASTE WATER SYSTEM

ASSET MANAGEMENT STRATEGY

3.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service due to financial constraint prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Figure 3.9 identifies critical assets in the waste water system.

Figure 3.9: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Pump Station	Continuously pump waste water.	Waste water back up, service interruption and/or environmental contamination.
2	Collection Network	Collect and move waste water through the system.	Waste water back up, service interruption and/or environmental contamination.
3	Storage Tank	Hold waste water.	Waste water back up, service interruption and/or environmental contamination.

3.8 Non Infrastructure Solution – Monitoring

The waste water system was designed in 2001/2002 with a useful life of 10 years. The useful life was surpassed in 2011 and the septic bed is now functioning effectively beyond its life. The waste water system is expected to last until 2019. For more information about life extension projection see Appendix 4.0.The Municipality will continue to operate an intensive monitoring program to ensure that the system is operating effectively and meeting service standards for the next 10 years. These actions include:

- Pipe biopsy
- Engineering report on life extension projections
- Engineering report on possible activities to extend life
- Municipal Staff testing and routine inspections

3.0 WASTE WATER SYSTEM

3.9 Maintenance & Operations Plan

Maintenance Activities: includes all actions necessary for keeping assets at their operable capacity. These actions were previously discussed in Figure 3.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities: affect service levels by determining day to day servicing of the waste water system. These activities determine safety of the system, life of equipment, etc.

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Environment Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Maintaining service risk and mitigation strategy database.
- Undertaking capital activities through a planned replacement and renewal system**.**

3.10 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 3.10 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 3.10: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Total value represents the highest net value to Municipality	10%
Has highest age relative to assets in group	10%
Has high operational or maintenance costs	10%
Replacement cost is less than maintenance and/or operating cost	10%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

3.11 Disposal Plan

Disposal includes any activity associated with removing a decommissioned asset from the Municipality. These activities include sale, demolition or relocation to another department. A majority of the waste water assets have been identified in this Plan as requiring disposal; however they will all be retained until there is a breakage in the system or Engineering reports indicate that system is no longer viable.

Surplus capital assets will be disposed of in the following manner:

- Disposals will be authorized by C.A.O and Management Staff
- Competitive bid process through a Request for Quotations
- Public auction
- Trade-In

Invitations to bid on capital assets offered for sale by the Municipality will be:

- Posted on the Municipality's website for at least 14 days before the closing date of the invitation to bid
- Published in at least one edition of the local newspapers

3.12 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

3.0 WASTE WATER SYSTEM

3.13 Risks Involved with the Plan

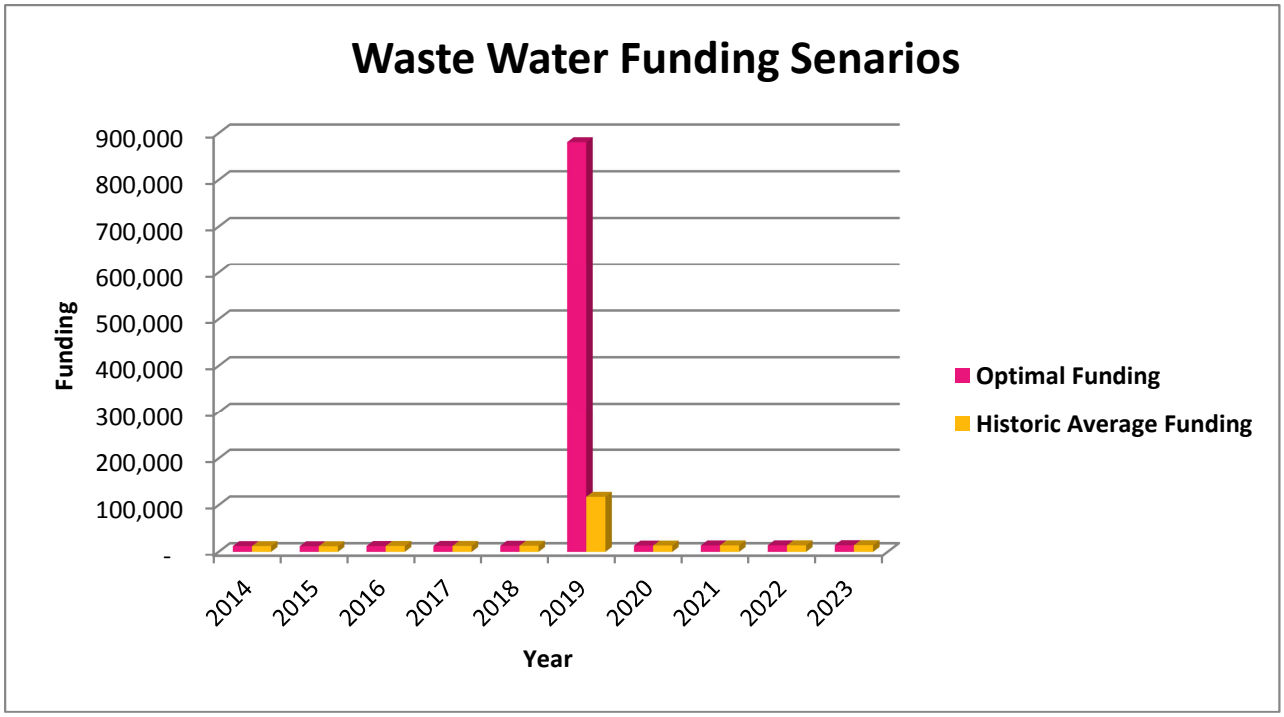
Optimal Capital Funding vs. Budgeted Capital Funding

The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the following two scenarios in Figure 3.11.

Scenario 1: Optimal funding for capital renewals, maintenance and operation activities required by the waste water assets over the next 10 years is $1,000,368 including inflation of 2% annually. An average annual budget of $13,404 for all years is required in addition to $763,054 of external funding for 2019 replacements that are not covered by the $100,000 of reserves.

Scenario 2: Over the last three years the Municipality has spent an average of $26,365 operating, maintaining and renewing the waste water system. In years where capital spending is required the waste water system relies on modest reserve draws downs because the system can only generate approx. $15,000 in revenue. Over the next 10 years McDougall is able to sustain an average budget of $13,404 with an extra $100,000 of reserves for use in 2019 if the Municipality continues to contribute an average of $9,964 to reserves annual. This funding projection does not provide sufficient funding to replace all assets that need it, impacting the risk factor at the facility and its ability to service users.

Figure 3.11: Optimal vs. Budgeted Funding Strategies



3.0 WASTE WATER SYSTEM

What McDougall Cannot Do

The Municipality cannot afford to allocate enough funds to reserves to cover the anticipated renewals because the system does not generate enough revenue from the 27 users. McDougall will apply for a loan from Infrastructure Ontario in 2019 on behalf of the system users to cover the replacement of the following assets: septic sand (equipment), and piping. The users will be asked to sign an agreement to pay back the loan over the next 10-15 years.

Service Consequences

Asset lifecycle activities that the Municipality decides not to undertake after consideration of the asset hierarchy, planned maintenance strategy and replace/renewal ranking guide may impact users' service experience. These consequences are explored in Figure 3.12.

Figure 3.12: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o More minor repair work for Municipal Staff o Stress on resources o Reactive maintenance	o Regular inspections of minor assets
The Municipality will only stock basic replacement parts for critical assets.	o Long wait times for replacement parts o Service interruptions	o Routine preventative maintenance on minor assets in poor condition o Scheduled maintenance on minor assets
Waste water assets will continue to deteriorate and they will only be repaired or replaced when breakage occurs despite planning due to financial constraint.	o Stress on resources o Service interruption o Waste water backups o Reactive maintenance o Possible contamination	o Identification and monitoring of equipment in poor condition o Pipe biopsy o Engineering inspections

3.0 WASTE WATER SYSTEM

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous sections. For data confidence information see Appendix 3.0.

3.14 Ten year Waste Water System Expenditure Projections

A majority of the waste water assets surpassed their useful lives in 2011 the system is now being monitored with the intention of it lasting until 2019. The optimal expenditure forecast for the next 10 years is shown in Figure 3.13. It includes projections for reserve building, operating, renewal, and maintenance activities. Note that all costs are shown with 2% annual inflation on average 2010 - 2012 values.

The total renewal and maintenance expenditure excluding asset replacement reserve contributions is $896,358 or $33,198 per user over the next 10 years. If reserve contributions under $10,000 annually are included the total, it rises to $983,251 or $36,417 per user over 10 years with inflation. Note neither of these totals includes operating expense which is projected to be between $1,500 and $1,800 annually.

The infrastructure gap including capital reserve drawdown is approximately $763,054 or $28,261 per user.

For comparative purposes Figure 3.14 shows waste water expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure 3.13: Projected Operating & Capital Expenditure

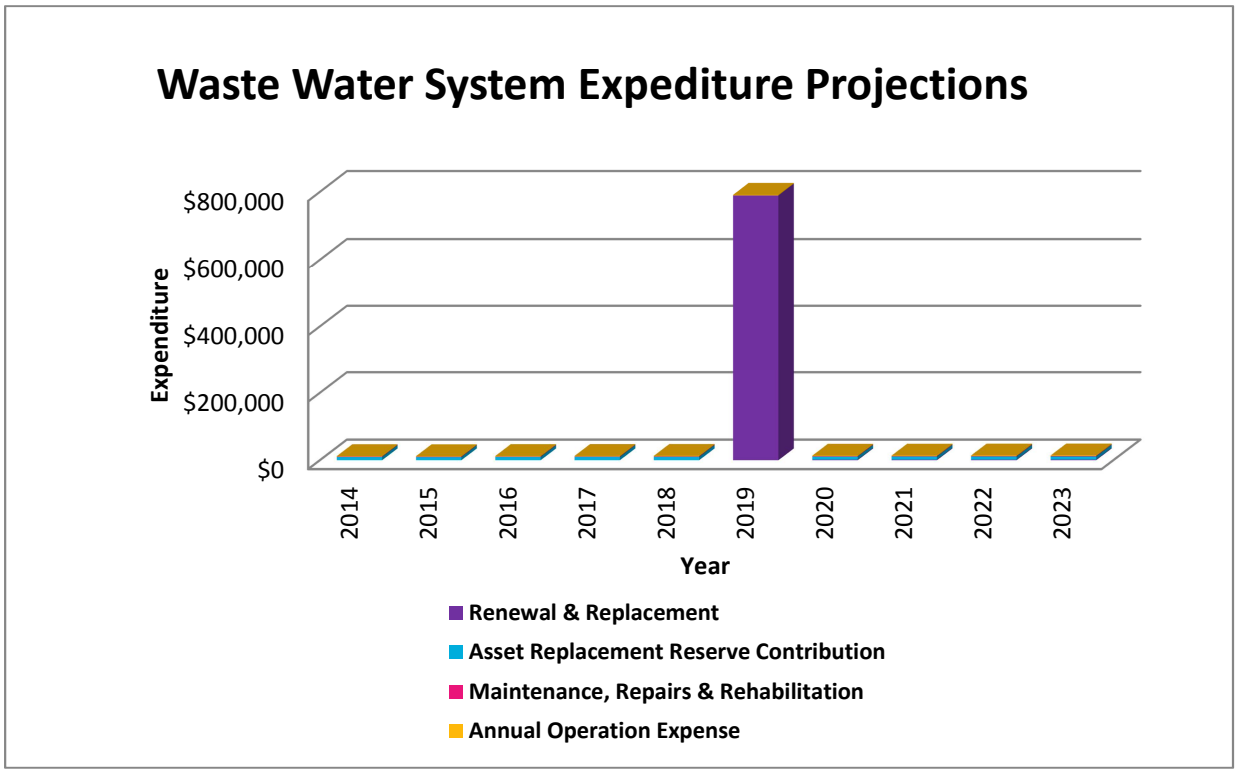
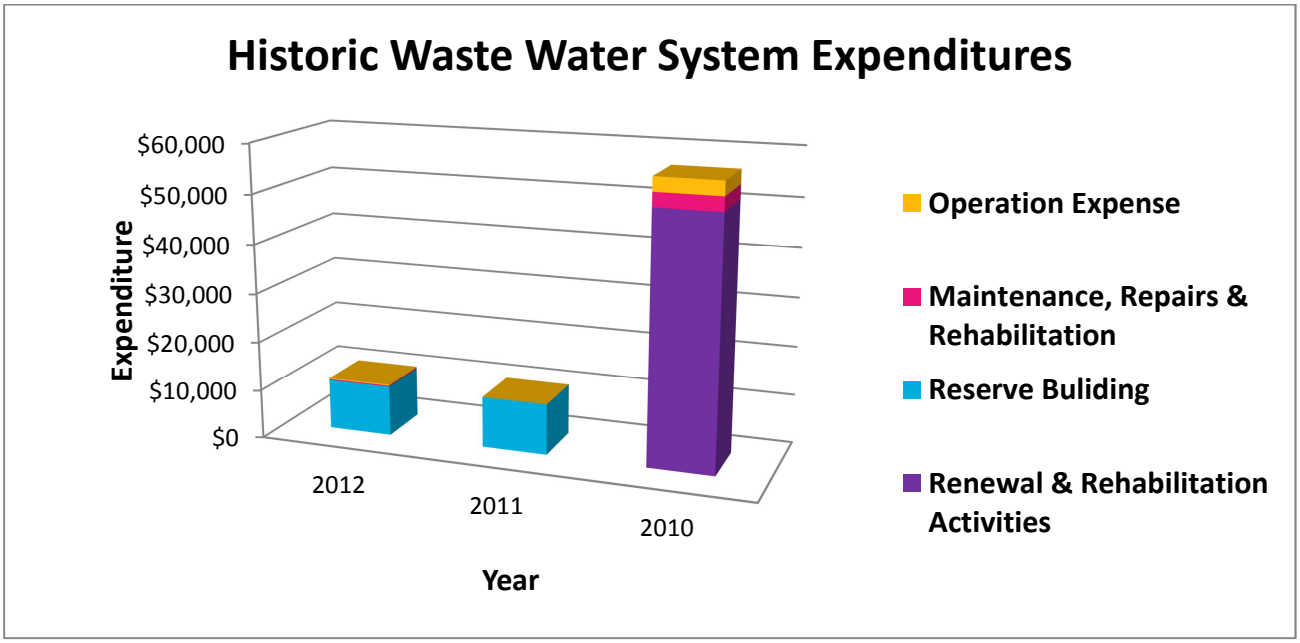


Figure 3.14: Historical Waste Water System Expenditures



Over the last three years the Municipality replaced pumping equipment at a value of approximately $50,000 in the waste water system. No assets in the waste water system will be replaced or rehabilitated until they break or there is a service disruption. The system is being monitored and the Municipality intends to avoid major renewals and replacements until 2019. The Municipality has invested in reserves for the system however reserves are not enough to cover all renewals necessary as previously discussed.

3.15 Ten year Waste Water System Funding Projections

The optimal funding forecast for the next 10 years is shown in Figure 3.15 and was previously discussed in Section 3.11. Funding requirements cover all renewal, maintenance, and operating and capital expenses. Since there are only 27 users of the system, service revenue is limited to less than $15,000 annually. There have been no capital charges to users since the last upgrade in 2002.

For comparative purposes Figure 3.14 shows waste water revenues from 2010 – 2012.

Figure 3.15: Waste Water System Funding Projections

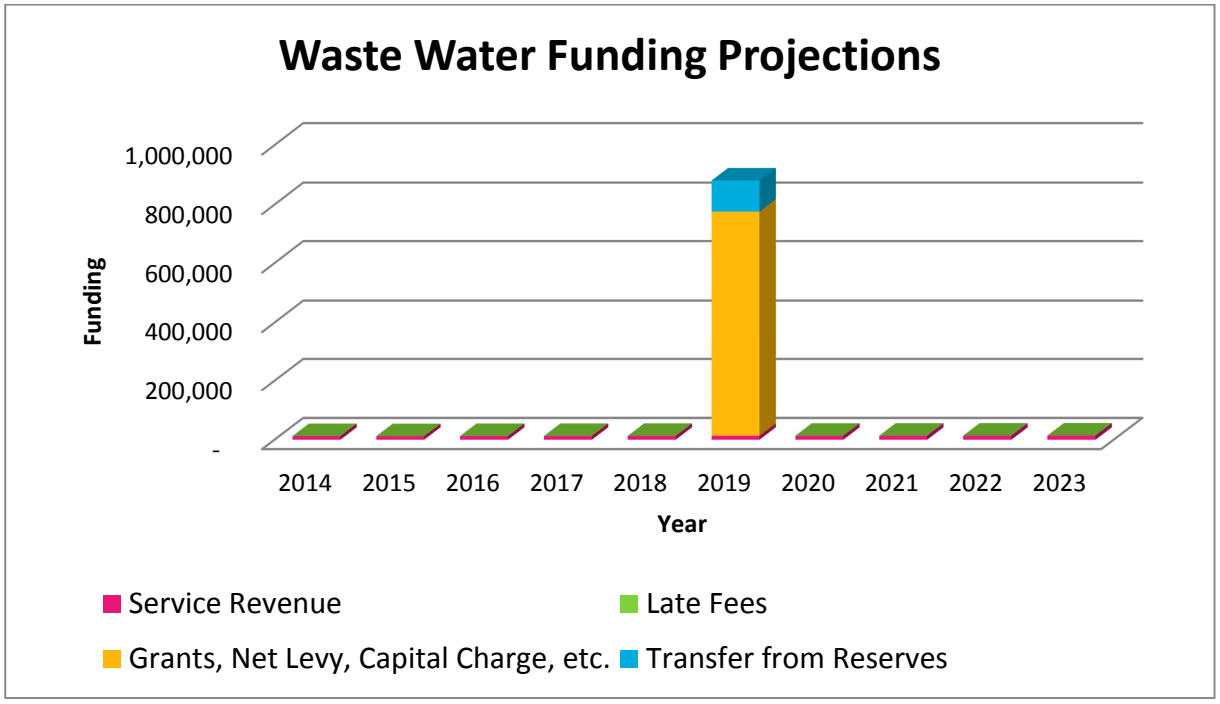
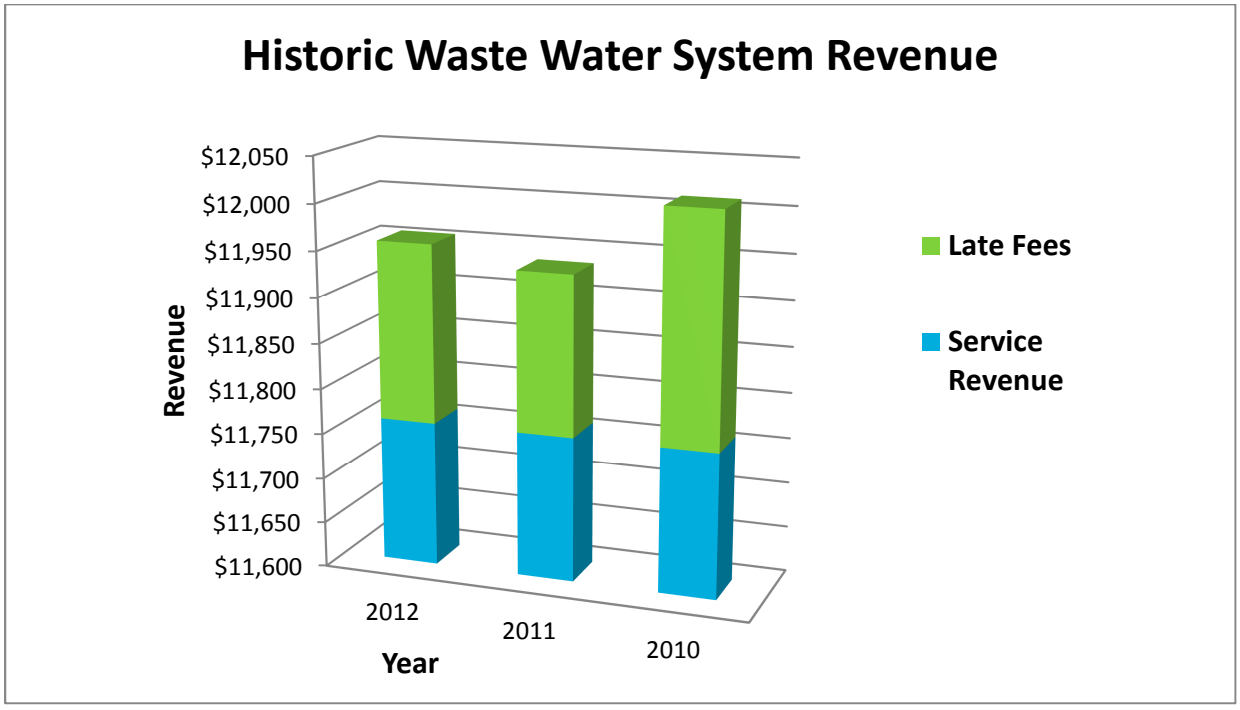


Figure 3.16: Historical Waste Water System Revenue



3.0 WASTE WATER SYSTEM

3.16 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the waste water system Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio 12%

The ratio above indicates that only 12% rehabilitation activities, maintenance and replacements are fully funded for the next 10 years with the Asset Management Plan in place. The infrastructure gap is 88% wide.

APPENDIX

3.0 WASTE WATER SYSTEM

1.0 CONDITION ASSESSMENT CRITERIA

Condition		
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required	Normal PM
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required	Normal PM + Minor M.
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended.	Normal PM + Major M.
D	**Critical:** Extensive deterioration, barely functional. Immediate action required	Major Repair + Rehab.
F	**Failed:** No longer functioning. Immediate action required	Rehab. Unlikely = Replace

Capacity	
A	System can support over 100% of demand
B	System can support over 90-99% of demand
C	System can support over 80-89% of demand
D	System can support over 70-79% of demand
F	System can support less than 70% of demand

Performance	
A	Exceeds / Meets all Performance Targets
B	Minor Performance Deficiencies
C	Considerable Performance Deficiencies
D	Major Performance Deficiencies
F	Does not meet any Performance Targets

Reliability

A	As Specified by Manufacturer	Never Failed
B	Random Breakdown	Fails every 20 Years
C	Occasional Breakdown	Fails every 5 Years
D	Periodic Breakdown	Falls every 2 Years
F	Continuous Breakdown	Fails Annually

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or not the service valuable to the public.

These performance measures include:

Purpose: Does the service satisfy users' needs?

Reliability: Does the service have the capability to maintain its functions on a routine basis?

Safety: Are the users protected from potential risks associated with the service?

Quality: Does the service fulfill its purpose to a high degree of excellence?

Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.

These activities affect the annual operating budget as the following performance measures:

3.0 WASTE WATER SYSTEM

Operations: routine activities that provide the service.

Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.

Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Operation Expenditure	A	Based on actual spending records. Consideration given to historical records.
Maintenance Expenditure	A	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from asset registry, Municipal Water Works Staff recommendations and industry standards
Asset Useful Lives	B	Based on Municipal Water Works Staff recommendations and industry standards

Georgian Engineering

70 Isabella St. Unit 111 Parry Sound, On. P2A 1M6
705-746-1196 746-1197 fax
bob.georgian@cogeco.net

April 5, 2013

McDougall Township
5 Barager Drive,
McDougall, ON
P2A 2W9

Att: Mr. Tim Hunt, Director of Public Works

Re: Crawford Septic

Dear Sir,

Below is our budget estimate for the cost of replacement of the Crawford Subdivision communal septic bed. Our costs is based on replacement costs of a similar project in the area in 2011 / 2012. Costs can vary depending on the availability of septic sand and method of disposal of the existing septic material, and time of construction.

Cost of Replacement

Septic System capacity - 70,000 litre / day conventional trench type leaching bed

8,000 c.m. septic sand @ $ 40 / c.m.	$ 320,000.00
3,000 l.m. piping @ $ 25.00 / l.m.	$ 75,000.00
Topsoil, hydroseed 6,000 s.m. @ $6.00 / s.m.	$ 36,000.00
Disposal of existing 8,000 @ $ 10.00 / c.m.	$ 80,000.00*
Septic haulage during construction 6 loads / day x 30 days @ $ 1,000 / load	$ 180,000.00
Engineering, Tender, Permit	$ 20,000.00
Contingency	$ 70,000.00
TOTAL	$ 781,000.00

* costs vary depending on location of disposal site

All prices plus H.S.T.

Associates
J. R. Hawes P.Eng
Robert Hughes P. Eng.

Georgian Engineering
Division of Sharwin Holdings

3.0 WASTE WATER SYSTEM

6.0 Funding Scenarios – Optimal vs. Historic Average

Waste Water Financing	Scenario One - Optimal Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Service Revenue	12,230	11,995	12,466	12,701	12,936	13,171	13,406	13,642	13,877	14,112	14,347
Grants, Capital Charge, etc.	-	-	-	-	-	763,054	-	-	-	-	-
Increase Development Fees %											
Increase Service Fees %											
USER											
Connection Sales & Fees											
Late Fees	212	216	220	225	229	233	237	241	245	250	254
RESERVES											
Transfer from Reserves	-	-	-	-	-	104,469	-	-	-	-	-
TOTAL REVENUE	**12,443**	**12,212**	**12,686**	**12,925**	**13,165**	**880,927**	**13,644**	**13,883**	**14,122**	**14,362**	**14,601**
OPERATION EXPENSE											
Annual Operation Expense	1,573	1,604	1,635	1,665	1,696	1,727	1,758	1,789	1,820	1,850	1,881
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal & Replacement	-	-	-	-	-	789,600	1,685	1,715	1,745	1,774	1,804
Maintenance, Repairs & Rehabilitation	1,047	1,067	1,088	1,108	1,129	-	1,170	1,190	1,211	1,231	1,252
Non Infrastructure Solutions											
Disposal Activities	-	-	-	-	-	89,600	-	-	-	-	-
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution	9,823	9,541	9,964	10,152	10,340	-	9,031	9,189	9,347	9,506	9,664
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve	54,649	64,472	74,013	83,977	94,129	104,469	-	9,031	18,220	27,567	37,073
TOTAL EXPENSE	**12,442**	**12,212**	**12,686**	**12,925**	**13,165**	**880,927**	**13,644**	**13,883**	**14,122**	**14,362**	**14,601**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

***All figures shown in CAD $**
****Inflation assumption is 2 %**
***** Forecasted revenues, reserve contributions & expenditures are based on 2010 - 2012 actual spending averages**

Waste Water Financing	Scenario Two Historic Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Service Revenue	12,230	11,995	12,466	12,701	12,936	13,171	13,406	13,642	13,877	14,112	14,347
Grants											
Increase Development Fees %											
Increase Service Fees %											
USER											
Connection Sales & Fees											
Late Fees	212	216	220	225	229	233	237	241	245	250	254
RESERVES											
Transfer from Reserves	-	-	-	-	-	104,469	-	-	-	-	-
TOTAL REVENUE	**12,443**	**12,212**	**12,686**	**12,925**	**13,165**	**117,873**	**13,644**	**13,883**	**14,122**	**14,362**	**14,601**
OPERATION EXPENSE											
Annual Operation Expense	1,573	1,604	1,635	1,665	1,696	1,727	1,758	1,789	1,820	1,850	1,881
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal & Replacement	-	-	-	-	-	789,600	1,685	1,715	1,745	1,774	1,804
Maintenance, Repairs & Rehabilitation	1,047	1,067	1,088	1,108	1,129	-	1,170	1,190	1,211	1,231	1,252
Non Infrastructure Solutions											
Disposal Activities	-	-	-	-	-	89,600	-	-	-	-	-
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution	9,823	9,541	9,964	10,152	10,340	-	9,031	9,189	9,347	9,506	9,664
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve	54,649	64,472	74,013	83,977	94,129	104,469	-	9,031	18,220	27,567	37,073
TOTAL EXPENSE	**12,442**	**12,212**	**12,686**	**12,925**	**13,165**	**880,927**	**13,644**	**13,883**	**14,122**	**14,362**	**14,601**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**-**	**763,054**	**-**	**-**	**-**	**-**	**-**

***All figures shown in CAD $**
****Inflation assumption is 2 %**
***** Forecasted revenues, reserve contributions & expenditures are based on 2010 - 2012 actual spending averages**

7.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM

Asset Component	Size (mm)	Quantity	Unit	Useful Life	Life Remaining	2012 Replacement Cost	Renewal Year
Pipe	100	2438	m	30	-3%	$ 75,000	2019
Pipe	200	24	m	40	23%	$ 7,392	2022
Septic Sand	-	8000	cm^2	30	-3%	$ 320,000	2019
Topsoil & Hydro seeding	-	6000	m^2	10	-10%	$ 36,000	2019
Force main	100	500	m	30	-3%	$ 2,000	2019
Pump Station - repairs	-	1	Bldg.	75	59%	$ 2,000	2019
Disposal of Existing	-	-	-	-	-	$ 80,000	2019
Septic Haulage during Construction	-	-	-	-	-	$ 180,000	2019
Engineering, Tender, Permit	-	-	-	-	-	$ 20,000	2019
Contingency	-	-	-	-	-	$ 70,000	2019
					Program Total	**$ 792,392**	

Municipality of McDougall

4.0 Roadway System

Asset Management Plan

December 2013

4.0 ROADWAY SYSTEM

Contents

4.0 ROADWAY SYSTEM

4.0 ROADWAY SYSTEM

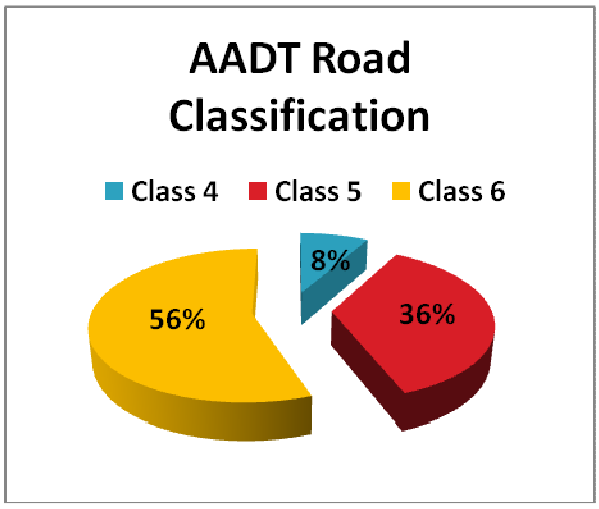
STATE OF INFRASTRUCTURE

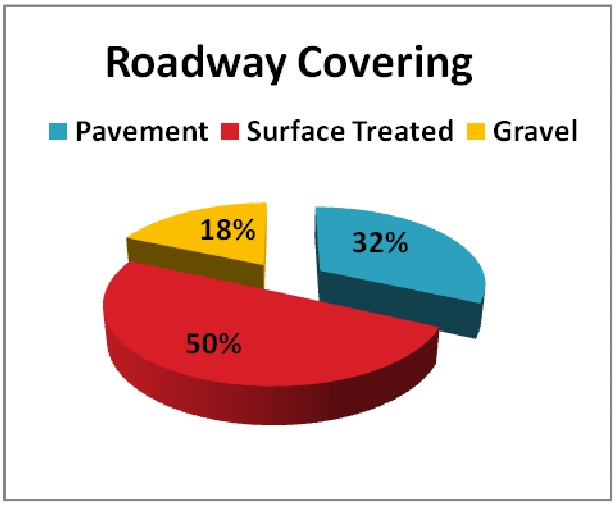
4.1 Inventory

The Municipality's road system consists of roadways, structures and traffic system. The current inventory is broken down in Figure 4.1. The source of the information is the Asset Inventory Registry. For analysis, the Municipality relied on internal knowledge of the system, and Engineering reports.

Figure 4.1: Road System Inventory Summary

Asset Type	Asset Component	Inventory
Roadways	Sidewalks	4 kms
	Rural – local	136 kms
Structures	Bridges & Major Culverts	8
	Minor Culverts	3,608
	Guard Rails	6 kms
Traffic System	Standard Streetlights	108
	Traffic Signs	550





4.0 ROADWAY SYSTEM

4.2 Valuation

The historical cost of the road system is shown at 2012 values and only includes the road surfaces as the bases are unlikely to ever be replaced. The estimated replacement value of the system is based on Public Works projections using 2012 values. The estimated current replacement value (2012) of the road system is $18,414,396 or $7,072 per household in McDougall. Figure 4.2 shows the breakdown of historical and replacement costs.

Figure 4.2: Road System Historical & Replacement Value

<table>
<tr><th>Asset Type</th><th>Asset Component</th><th>Historical Cost 2012</th><th>Replacement Value 2012</th><th>Percentage of Replacement</th></tr>
<tr><td rowspan="2">Roadways</td><td>Sidewalks</td><td>$17,820</td><td>$163,680</td><td>0.9%</td></tr>
<tr><td>Rural – local</td><td>10,132,539</td><td>13,134,540</td><td>71.3%</td></tr>
<tr><td rowspan="4">Structures</td><td>Bridges & Major Culverts</td><td>$1,522,950</td><td>$5,116,176</td><td>27.8%</td></tr>
<tr><td>Minor Culverts</td><td>$1,255,409</td><td colspan="2" rowspan="4">Included in roadway replacement value</td></tr>
<tr><td>Guard Rails</td><td rowspan="3">Included in roadway historical cost</td></tr>
<tr><td rowspan="2">Traffic System</td><td>Standard Streetlights</td></tr>
<tr><td>Traffic Signs</td></tr>
<tr><td colspan="2">Total Value</td><td>$12,928,718</td><td>$18,414,396</td><td>100%</td></tr>
</table>

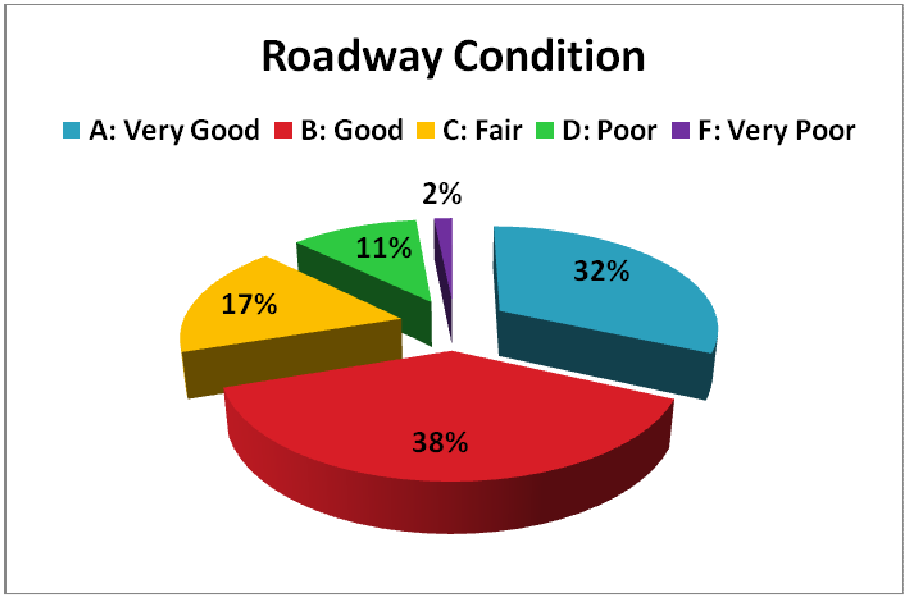
4.3 Condition Assessment

The condition report in Figure 4.3 was developed by Municipal Staff with consideration of current legislative requirements. The Municipality chose to rely on Municipal Staff in determining the condition of the system due to the number of external variables and high degree of internal knowledge of the system. Condition assessment criteria are available in the Appendix 1.0.

4.0 ROADWAY SYSTEM

Figure 4.3: Road System High Level Condition Assessment

Asset Type	Asset Component	Condition
Roadways	Sidewalks	B
	Rural – local	B
Structures	Bridges & Major Culverts	B
	Minor Culverts	B
	Guard Rails	B
Traffic System	Standard Streetlights	A
	Traffic Signs	B



4.0 ROADWAY SYSTEM

4.4 Lifecycle Activities

The road system assets can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 4.4.

Figure 4.4: Road System Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: brush trimming, grading, calcium spreading, bridge and culvert cleaning, spot improvements, etc.	75 - 100%
Major Maintenance	Unplanned maintenance & repair: pothole repair, crack sealing, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: replacing a gravel road with pavement, refurbishing signs, upgrading wooden guardrails to steel, ballast replacement and relamping, etc.	25 - 50%
Replacement	End of asset life: removal road surface, sign, culvert or bridge and replacement with an asset that does the same job.	0 - 25 %

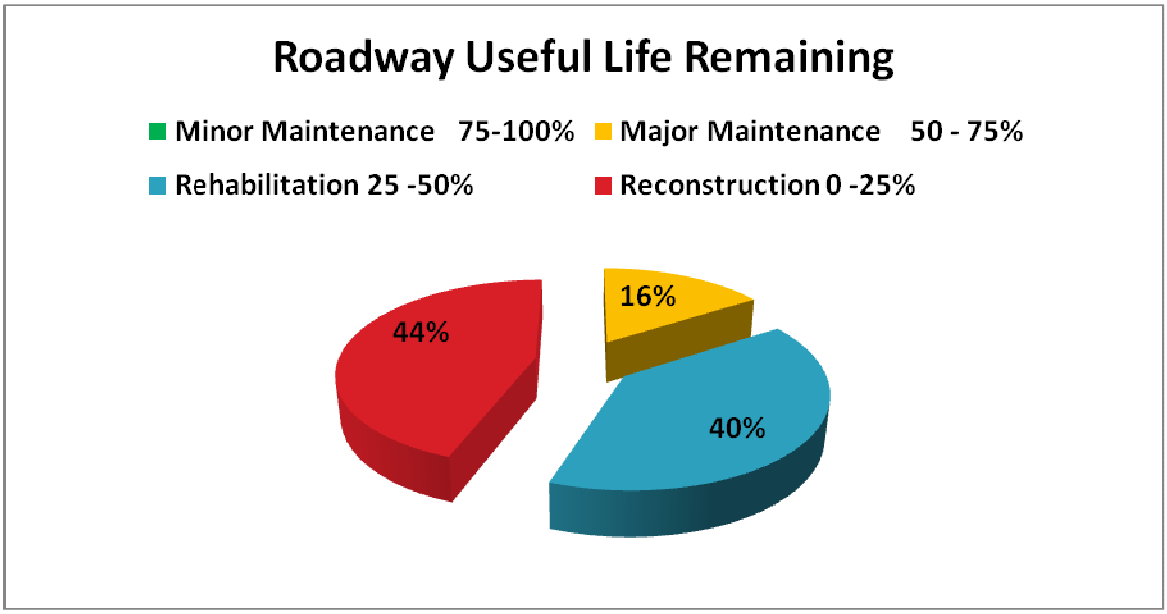
4.5 Life Expectancy

There are numerous direct and indirect variables that affect the useful lives of water assets such as climate, soil condition, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff in gauging useful life and life remaining for McDougall's road system. There are a large number of roads in the rehabilitation and reconstruction stage because of the back log of roads requiring treatment that has been deferred.

Figure 4.5: Road System Useful Life

Asset Type	Asset Component	Average Useful Life
Roadways	Sidewalks	20
	Rural – local	16
Structures	Bridges & Major Culverts	66
	Minor Culverts	42
	Guard Rails	30
Traffic System	Standard Streetlights	25
	Traffic Signs	20

Figure 4.6: Road System Remaining Useful Life



4.0 ROADWAY SYSTEM

DESIRED LEVEL OF SERVICE

4.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 4.7 and 4.8 cover the community and operation levels of services for roadways, guard rails, minor culverts, streetlights and traffic signs. Figures 4.9 and 4.10 cover levels for bridges, large culverts. These Figures identify target levels of service, and current performance relative to the measures identified. Future demand drivers, forecasts and effects were discussed in the Asset Management Plan Introduction Section 8.0 which includes all assets covered in the plan. Levels of service definitions are available in the Appendix 2.0.

4.0 ROADWAY SYSTEM

Figure 4.7: Roadway Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	To provide public access to all residential properties, public and commercial facilities within McDougall.	Number of properties with road access.	All properties have public road access.	Roads provided to all legally surveyed properties. Except in areas deemed water access only or where private roads exist.
Reliability	Minimize unplanned disruptions on roadways.	Number of unplanned road closures.	0 unplanned road closures.	0 periods of unexpected road closures.
Safety	Provide and maintain safe vehicle and pedestrian routes in municipality. Proper road drainage and ditching.	Proper signage for hazards. Number of road washouts. Streetlights are repaired in a timely manner.	8 Customer complaints regarding signage. 2 partial road washouts. All streetlights in 2012 were repaired within 30 days of notice.	5 Customer complaints regarding signage legibility, and orientation. 0 road washouts. All streetlights are repaired within 14 days of becoming aware issue.
Quality	Supply good roads to legislated standards.	Inspection of road conditions using Overall Condition Index.	86% of roads with O.C.I. over 70 (A & B rating).	Good average Overall Condition Index rating 100% of roads.
Capacity	Minimize levels of heavy congestion. Provide users with sufficient road capacity for their needs.	Customer complaints regarding congestion. Customer complaints about road sharing with cyclists.	0 Customer complaints regarding congestion. 0 Customer complaints about road sharing with cyclists.	5 Customer complaints regarding congestion. 5 Customer complaints about road sharing with cyclists.

4.0 ROADWAY SYSTEM

Figure 4.8: Roadway Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Control hazards to vehicles and pedestrians on roads.	Inspection of environmental surrounding of roadways (surface conditions, signs, bumps, frozen culverts, debris, wash outs, etc.). Number of customer service requests for hazard removal.	Met targets in the summer and exceeding them in the winter with minimum 5 days/week patrols. 10 customer service requests for hazard removal.	**Routine Patrolling:** **Class 4:** once every 14 days **Class 5:** once every 30 days, seasonal roads will not be inspected in the winter. 5 customer service requests for hazard removal.
Snow Removal	Snow is removed in a timely manner so as not to disrupt users. Sand is laid in a timely manner to ensure user safety.	Duration of plowing procedure.	Met targets in 2012.	***No expected operation between 10pm & 4am.*** **Class 4:** 8cm of snow complete 1 pass in 1 direction within 4 hours of start of operation. Once plowing has begun sand treatment is applied within 8 hours of beginning application to hills, curves, intersections and rail crossings. **Class 5:** seasonal roads receive no treatment.

4.0 ROADWAY SYSTEM

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Renewal	Useful lives of infrastructure should be increasing with the replacement of components.	Infrastructure useful life.	Nobel & Pineridge were both replaced in 2012 at end of life. Roadway average useful life remaining in 2012: 22%.	Infrastructure components are replaced before the end of the asset's lifecycle.
	Renew roadways effectively while minimizing disruption.	Renewal activity completion times and cost.	2012 renewals were on schedule and budget.	All renewal activities completed on time, and on budget.
Upgrade/New	New roads or road surface replacements are safe.	New roads or road surface replacements meet legislation.	2012 renewals met legislation.	All new roads or road surface replacements are constructed in accordance with legislated requirements.

4.0 ROADWAY SYSTEM

Figure 4.9: Bridge & Large Culvert Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	Provide adequate passage over waterways.	Number of user complaints regarding ineffective bridges (sink holes, clogged culverts, etc.)	0 user complaints regarding ineffective bridges	0 user complaints regarding ineffective bridges.
Reliability	Minimize equipment failure.	Unplanned interruptions of road service due to water over flows.	No interruptions to bridge service due to water over flows.	No interruptions to bridge service due to water over flows.
Safety	Prevent possible collapse of bridges.	Bi - annual engineering bridge reports.	All bridges in the 2013 inspection report were rated good or excellent.	Average Bridge Condition Index rating 'Good' or above.
Quality	Bridges are built and maintained to legislated standards.	Bi - annual engineering bridge reports.	Three recommended rehabilitation activities for the next 10 years, overall positive.	Positive overall comments.
Capacity	Bridges provide passage to densely populated areas of the Municipality that would otherwise not be accessible.	Number of densely populated areas without bridges. Number of complaints about lack of bridge access in specific areas.	0 densely populated areas without bridges. 0 complaints about lack of bridge access.	0 densely populated areas without bridges. 0 complaints about lack of bridge access.

Figure 4.10: Bridge & Large Culvert Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Operate effectively.	Cleaning schedule (expansion joints, gutters, shoulders, etc.).	All cleaning in 2012 was carried out within timeframes specified in Bridge Report.	Bridges cleared of debris as specified in the Bridge Report.
Maintenance	Protect investment in bridges. Provide routine maintenance work.	Number of customer complaints regarding bridge maintenance. Maintenance schedule.	0 customer complaints regarding bridge maintenance. All maintenance in 2012 was carried out within timeframes specified in Bridge Report.	0 customer complaints regarding bridge maintenance. All maintenance activities are complete within a reasonable timeframe.
Renewal	Useful lives of infrastructure should be increasing with the replacement of components.	Infrastructure useful lives.	Bell Lake Bridge & Hurdville Culvert 2 have been replaced before the end of their lives in 2012. Average bridge/culvert useful life remaining in 2012: 71%	Infrastructure components are replaced before the end of the asset's lifecycle.
Upgrade/New	Bridges are efficient.	Bridge maintenance activities are within budget.	2012 maintenance was under budget $9,071.	Bridges cost less to maintain than replace.

4.0 ROADWAY SYSTEM

ASSET MANAGEMENT STRATEGY

4.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Note that Roadways are further prioritized by Classification. Figure 4.11 identifies critical assets in the road system.

Figure 4.11: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Roadways	Provide good quality, safe roads throughout the Municipality.	Road way collapse/breakdown causes service disruptions, increase in accidents, legal ramifications, etc.
2	Bridges & Major Culverts	Provide safe passage over waterways.	Bridge collapse/breakdown causes service disruptions, increase in accidents, legal ramifications, etc.
3	Minor Culverts	Provide adequate drainage to keep roadways safe.	Culvert breakdown/clogging causes road washouts, flooding, service disruptions, increase in accidents, etc.

4.0 ROADWAY SYSTEM

4.8 Maintenance & Operations Plan

Maintenance Activities: includes all actions necessary for keeping assets at their operable capacity. These actions were previously discussed in Figure 4.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities: affect service levels by determining day to day servicing of the road system. These activities determine safety of the system, life of assets, etc.

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Transportation Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Undertaking capital activities through a planned replacement and renewal system**.**

4.0 ROADWAY SYSTEM

4.9 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 4.12 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 4.12: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Has highest age relative to assets in group	15%
Has high operational or maintenance costs	15%
Replacement cost is less than maintenance and/or operating cost	10%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

4.10 Disposal Plan

Road system assets have zero salvage value in the Municipality and are either land filled or recycled at the McDougall Landfill.

4.11 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

4.12 Risks Involved with the Plan

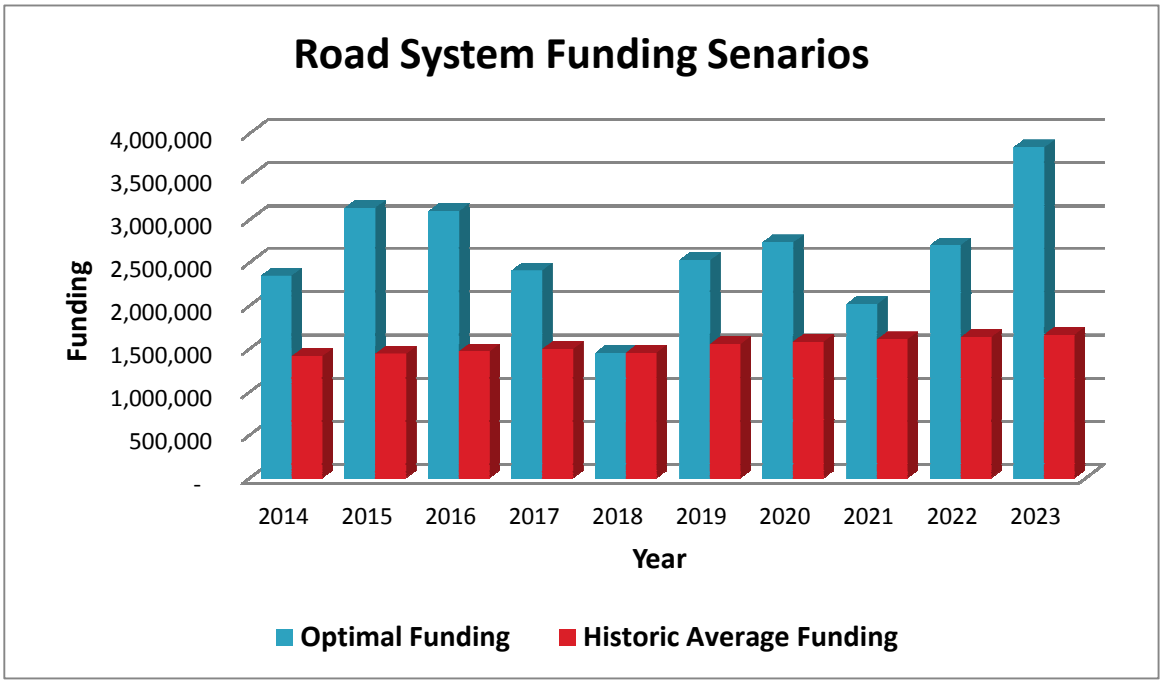
Optimal Capital Funding vs. Budgeted Capital Funding

The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the following two scenarios in Figure 4.13.

Scenario 1: Optimal funding for capital renewals, maintenance and operation activities required by the road system over the next 10 years is $26,217,942 including inflation of 2% annually. An annual budget of $2,621,794 over the next 10 years is required.

Scenario 2: Over the last three years the Municipality has spent an average of $1,806,095 operating, maintaining and renewing the road system, including external financing. In years where capital spending is required, the road system relies on external funding which is not included in this Plan due to its uncertainty. Over the next 10 years McDougall is able to sustain an average budget of $15,277,957 or $1,527,796 annually. This funding projection does not provide sufficient funding to replace all assets that need renewal, impacting the risk factor of the system and its ability to service users.

Figure 4.13: Optimal vs. Budgeted Funding Strategies



4.0 ROADWAY SYSTEM

What McDougall Cannot Do

The Municipality cannot afford to allocate enough net levy funds to cover the anticipated renewals because the net levy is at its Council approved maximum. McDougall cannot raise taxes enough to cover the deficit of $10,093,999 over the next 10 years or $1,093,998 annually. Nor, can the Municipality reduce its desired levels of service because they are mandated by M.T.O.

In 2013, McDougall received $851,100 in external funding for replacements and renewals from O.M.P.F (Ontario Municipal Partnership Fund) and the Gas Tax. McDougall will continue to apply for external funding to help cover the infrastructure gap. In cases where funding is not available the Municipality will defer road resurfacing projects until funds become available or resurface sections of the road to keep within the $850,000 capital budget.

Service Consequences

Asset lifecycle activities that the Municipality decides not to undertake after consideration of the asset hierarchy, planned maintenance strategy and replace/renewal ranking guide may impact users' service experience. These consequences are explored in Figure 4.14.

Figure 4.14: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o More minor repair work for Municipal Staff o Stress on resources o Reactive maintenance	o Regular inspections of lower demand roads and culverts
Roadways with higher traffic volumes and speeds will receive renewals before those with lower demand.	o Some roads with not receive renewal treatment before the end of their useful lives – poor road conditions o Reactive maintenance o More preventative repair work for Municipal Staff to extend the roadway life	o Routine preventative maintenance on lower demand roads o Scheduled maintenance on lower demand roads
Minor culverts will only be replaced or repaired when they breakdown.	o Service interruption - roadway wash outs and flooding o Reactive maintenance o Stress on resources o Municipality must keep replacement culverts on hand	o Identification and monitoring of minor culverts in poor condition

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous sections. For data confidence information see Appendix 3.0.

4.13 Ten year Road System Expenditure Projections

The optimal expenditure forecast for the next 10 years is shown in Figure 4.15. It includes projections for operating, renewal, and maintenance activities. Note that all costs are shown with 2% annual inflation on average 2010 - 2012 values.

The total renewal and maintenance expenditure is $19,598,279 or $7,526 per user over the next 10 years. Note that this total does not include operating expense.

For comparative purposes Figure 4.16 shows road system expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure 4.15: Projected Operating & Capital Expenditure

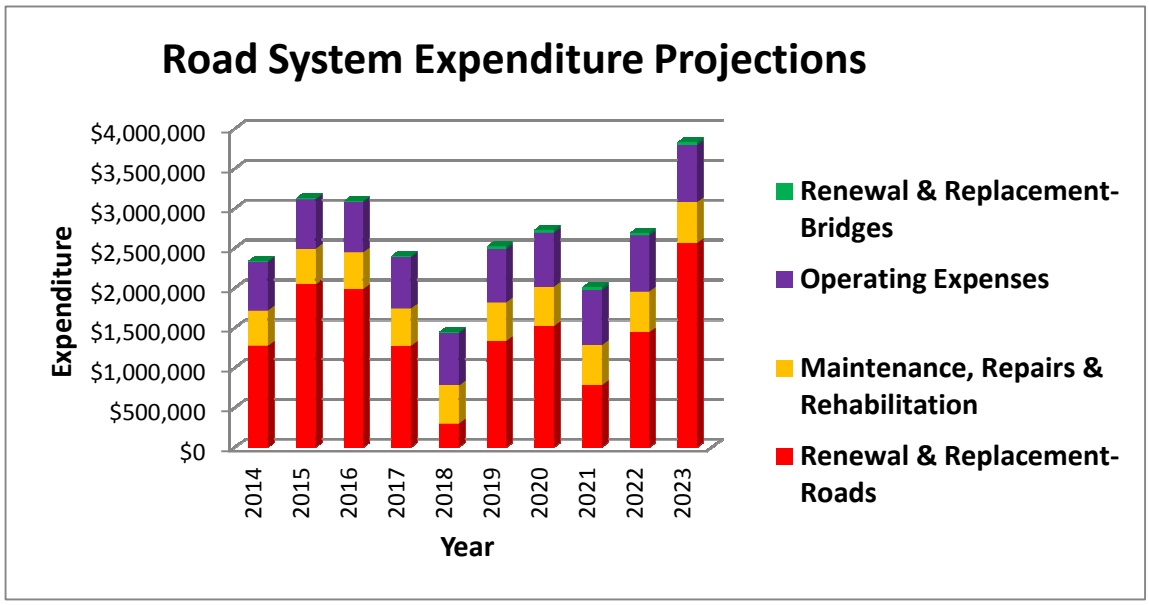
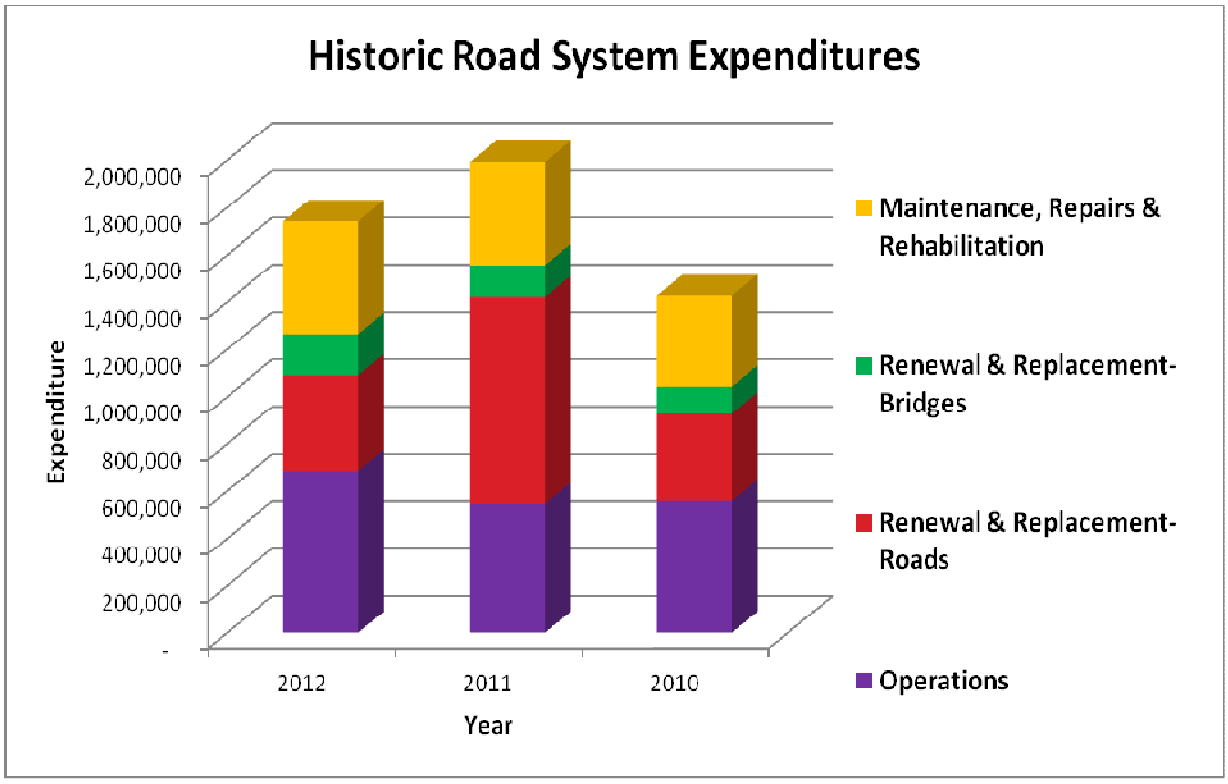


Figure 4.16: Historic Road System Expenditures



4.0 ROADWAY SYSTEM

From 2010 to 2013 the Municipality has replaced 9 road surfaces and rehabilitated 2 major culverts. In the next 10 years McDougall plans to increase its resurfacing treatments as the road system has declined and 68% of roads require either rehabilitation or reconstruction. Moreover, 22% of roads are ranked C to F on the condition scale. Over the next 10 years 58 of the 61 roads come up for resurface treatment at an average of 6 roads per year. These treatments range in scope and size the least expensive treatment is approx. $10,000 while the highest is over $500,000; the average projected cost per road is $249,577(inflation included). No bridges or major culverts are targeted for major rehabilitation or replacement in the next 10 years. The road system does not have any funds allocated to reserves and operates on a break even budget drawing off the net levy and external funding.

4.14 Ten year Road System Funding Projections

The optimal funding forecast for the next 10 years is shown in Figure 4.17 and was previously discussed in Section 4.12. Funding requirements cover all renewal, maintenance, operating and capital expenses. For comparative purposes Figure 4.18 shows road system funding from 2010 – 2012.

Figure 4.17: Road System Funding Projections

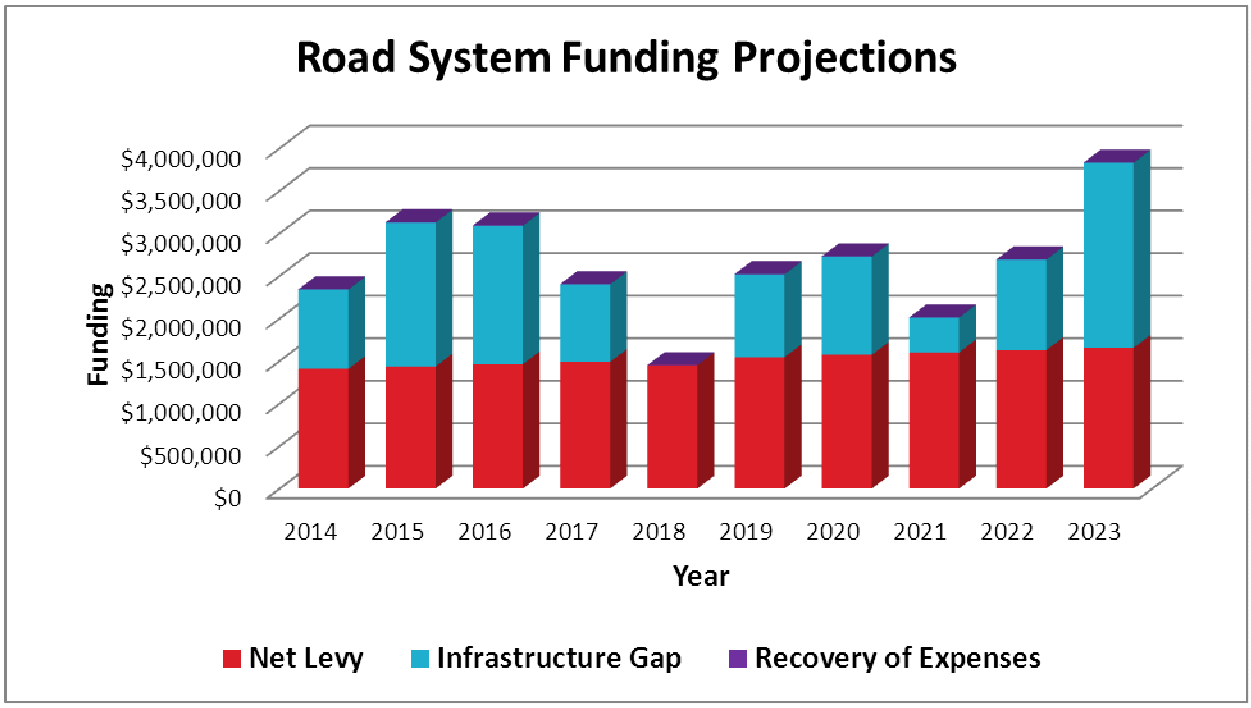
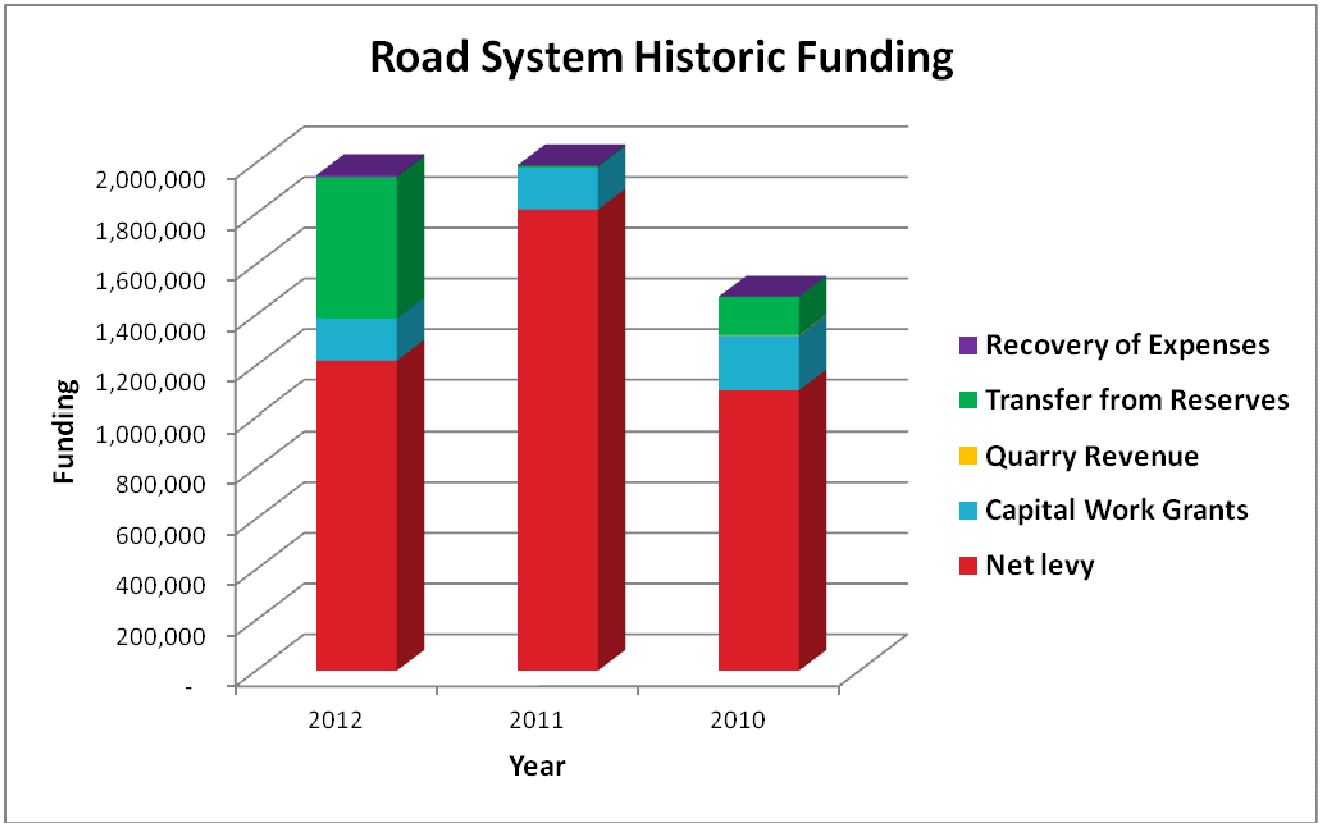


Figure 4.18: Historic Road System Funding



4.15 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the waste water system Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio 46.7%

Since McDougall does not have reserves for the road system the asset renewal would be zero today. However based on net levy projections the Municipality is able to finance 46.7% of renewal, maintenance and rehabilitation activities after the operation expenses are covered. The infrastructure gap is 53.3% wide.

4.0 ROADWAY SYSTEM

APPENDIX

1.0 CONDITION ASSESSMENT CRITERIA

Roadways

Rating	Description
OCI 80 - 100 A	**Very Good:** Pavement is in excellent condition w. very smooth ride o Slight surface deformation distresses o No visible surface defects or cracking
OCI 70 - 80 B	**Good:** Pavement is in good condition w. smooth ride o Slight to moderate surface deformation distresses o Slight to moderate intermittent surface defects and/or cracking
OCI 60 - 70 C	**Fair:** Pavement is in fair condition w. acceptable ride o Intermittent to frequent surface defects and/or cracking distresses o Localized alligator cracking may be present
OCI 50 - 60 D	**Poor:** Pavement is in poor condition w. barely acceptable ride from frequent bumps because of distress o Moderate to severe frequent surface defects and/or cracking distress o Localized slight to moderate alligator cracking may be present
OCI Less than 50 Very Poor F	**Very Poor:** Pavement is in very poor condition w. uncomfortable ride o Frequent to extensive bumps with frequent to extensive surface defects and/or cracking distresses o Frequent slight to moderate alligator cracking may be present

4.0 ROADWAY SYSTEM

Bridges, Culverts, Streetlights & Signs

Rating	Description
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended
D	**Critical:** Extensive deterioration, barely functional.
F	**Failed:** No longer functioning.

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or the service valuable to the public.
These performance measures include:
Purpose: Does the service satisfy users' needs?
Reliability: Does the service have the capability to maintain its functions on a routine basis?
Safety: Are the users protected from potential risks associated with the service?
Quality: Does the service fulfill its purpose to a high degree of excellence?
Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.
These activities affect the annual operating budget as the following performance measures:
Operations: routine activities that provide the service.
Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

4.0 ROADWAY SYSTEM

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.
Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Operation Expenditure	A	Based on actual spending records. Consideration given to historical records.
Maintenance Expenditure	A	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from asset registry, Public Works Staff recommendations and industry standards
Asset Useful Lives	B	Based on Public Works Staff recommendations and industry standards.

4.0 ROADWAY SYSTEM

4.0 FUNDING SCENARIOS – OPTIMAL VS. HISTORIC AVERAGE

2012 Road System Financing	*Scenario One Optimal Funding*										
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
REVENUE											
Net Levy	1,406,696	1,434,278	1,461,860	1,489,443	1,447,232	1,544,607	1,572,189	1,599,772	1,627,354	1,654,936	1,666,353
Infrastructure Gap	932,111	1,693,749	1,628,706	910,687		973,222	1,155,085	408,985	1,063,240	2,174,200	
Recovery of Expenses	3,638	3,709	3,781	3,852	3,923	3,995	4,066	4,137	4,209	4,280	4,351
Quarry Revenue											
Increase Development Fees %											
Increase Service Fees %											
TOTAL REVENUE	**2,342,445**	**3,131,736**	**3,094,347**	**2,403,982**	**1,451,155**	**2,521,824**	**2,731,340**	**2,012,894**	**2,694,803**	**3,833,416**	**1,670,705**
OPERATION EXPENSE											
Total Operating Expenses	608,293	620,221	632,148	644,075	656,003	667,930	679,857	691,785	703,712	715,639	727,567
CAPITAL EXPENSE											
Renewal & Replacement-Roads	1,276,726	2,045,122	1,986,836	1,275,574	301,851	1,334,757	1,523,075	783,432	1,444,142	2,561,559	415,519
Renewal & Replacement-Bridges	16,301	16,620	16,940	17,259	17,579	34,765	35,386	36,007	36,628	37,248	-
Maintenance, Repairs & Rehab.	441,124	449,774	458,423	467,073	475,722	484,372	493,021	501,671	510,320	518,970	527,619
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
TOTAL EXPENSE	**2,342,445**	**3,131,736**	**3,094,347**	**2,403,981**	**1,451,155**	**2,521,824**	**2,731,340**	**2,012,894**	**2,694,802**	**3,833,417**	**1,670,705**
NET INCOME (deficit)	-	-	-	-	-	-	-	-	-	-	-

***All figures shown in CAD $**
****Inflation assumption is 2 %**

***** Forecasted revenues & expenditures are based on 2010 2012 actual spending (average)**

Scenario Two - Historic Average Funding											
2012 Road System Financing	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
REVENUE											
Net Levy	1,406,696	1,434,278	1,461,860	1,489,443	1,447,232	1,544,607	1,572,189	1,599,772	1,627,354	1,654,936	1,666,353
Recovery of Expenses	3,638	3,709	3,781	3,852	3,923	3,995	4,066	4,137	4,209	4,280	4,351
Quarry Revenue											
Increase Development Fees %											
Increase Service Fees %											
TOTAL REVENUE	**1,410,334**	**1,437,987**	**1,465,641**	**1,493,295**	**1,451,155**	**1,548,602**	**1,576,255**	**1,603,909**	**1,631,563**	**1,659,216**	**1,670,705**
OPERATION EXPENSE											
Operating Expenses	608,293	620,221	632,148	644,075	656,003	667,930	679,857	691,785	703,712	715,639	727,567
CAPITAL EXPENSE											
Renewal & Replacement-Roads	1,276,726	2,045,122	1,986,836	1,275,574	301,851	1,334,757	1,523,075	783,432	1,444,142	2,561,559	415,519
Renewal & Replacement-Bridges	16,301	16,620	16,940	17,259	17,579	34,765	35,386	36,007	36,628	37,248	-
Maintenance, Repairs & Rehab.	441,124	449,774	458,423	467,073	475,722	484,372	493,021	501,671	510,320	518,970	527,619
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
TOTAL EXPENSE	**2,342,445**	**3,131,736**	**3,094,347**	**2,403,981**	**1,451,155**	**2,521,824**	**2,731,340**	**2,012,894**	**2,694,802**	**3,833,417**	**1,670,705**
NET INCOME (deficit)	**(932,111)**	**(1,693,750)**	**(1,628,706)**	**(910,687)**	**-**	**(973,222)**	**(1,155,085)**	**(408,985)**	**(1,063,240)**	**(2,174,200)**	**-**

***All figures shown in CAD $**
****Inflation assumption is 2 %**

***** Forecasted revenues & expenditures are based on 2010 2012 actual spending (average)**

4.0 ROADWAY SYSTEM

5.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM

Pavement Capital Renewals

Road	KMS	Year Installed	Pavement Standard Useful Life	Useful Life Remaining	First Resurfacing	Second Resurfacing	Replacement Cost w. Inflation
ARMSTRONG AVE	0.1	2003	25	60%	2023	2048	$ 20,709
NOBEL ROAD	9	1990	25	8%	2013	2038	$ 309,000
NOBEL RD SIDEWALK	2.7	2009/2013	20	100%	2033	2053	$ -
BIG SOUND RD	2.6	1998	25	40%	2020	2045	$ 501,158
BURNSIDE BRIDGE RD HL4	1.6	1997	25	36%	2019	2044	$ 300,758
CEDAR SHORE RD	0.5	2001	25	52%	2023	2048	$ 103,545
CRAWFORD RD	0.2	2003	25	60%	2023	2048	$ 41,418
DUFF CRESCENT	0.7	1993	25	20%	2021	2046	$ 39,506
FELSMAN DR	0.6	1998	25	40%	2021	2046	$ 118,519
GEORGE HUNT DR	1.6	1998	25	40%	2022	2047	$ 323,698
GLENROCK RD	0.5	2003	25	60%	2023	2048	$ 103,545
GRANDVIEW DR	0.6	1997	25	36%	2021	2046	$ 118,519
HAMMEL AVE	3.3	1997	25	36%	2016/17	2041	$ 580,887
HILLVIEW DR	0.3	1993	25	20%	2020	2045	$ 57,826
MAPLE RIDGE DR	0.2	2003	25	60%	2020	2045	$ 38,551
McDOUGALL RD -HL4	8	1988	25	0%	2015	2040	$ 1,350,864
MOUNTAIN BASIN DR	0.6	2003	25	60%	2023	2048	$ 124,254
MUNICIPAL DR	0.4	1990	25	8%	2015	2040	$ 67,543
MURRAY POINT RD	0.9	1998	25	40%	2021	2046	$ 144,299
NORTH RD	3	1990	25	8%	2014	2039	$ 492,237
NORTH RD SIDEWALK	1	1990	20	-15%	2014	2034	$ 33,990
PARKWAY DR	1.2	1998	25	40%	2022	2047	$ 242,773
PARRY SOUND DR	0.8		25				$ -
PINERIDGE DR	1.8	1989	25	4%	2013	2038	$ 286,740
PLEASANT VIEW DR	0.3	1994	25	24%	2018	2043	$ 54,959
RIVERVIEW DR	0.3	1994	25	24%	2018	2043	$ 54,959
RYDER DR	1	1998/08	25	80%	2019	2044	$ 187,974
SKERRYVORE CIRCLE	1.6	1993	25	20%	2019	2044	$ 300,758
SOUNDVIEW COURT	0.2	1998	25	40%	2018	2043	$ 36,639
STRAWBERRY LANE	0.2	2003	25	60%	2022	2047	$ 40,462
TAYLOR CRESCENT	0.7	1996	25	32%	2020	2045	$ 134,927
SPADZINSKI LANE	0.6	1989	25	4%	2022	2047	$ 121,387
					Total Pavement Program		***$ 6,332,404***

4.0 ROADWAY SYSTEM

Surface Treatment Capital Renewals

Road	KMS	Year Installed	Surface Treated Standard Useful Life	Useful Life Remaining	First Resurfacing	Second Resurfacing	Replacement Cost w. Inflation
BEAVER TRAIL	0.8	2002	8	-38%	2014	2022	$ 140,208
BELL LAKE RD	0.9	2010	8	63%	2017	2025	$ 76,810
BUTTERCUP RD	0.4	2002	8	-38%	2014	2022	$ 70,104
CORNFLOWER ROAD	0.4	2002	8	-38%	2014	2022	$ 70,104
HODDYS SIDE RD	1.5	1998	8	-88%	2014	2022	$ 262,890
HURDVILLE RD	8.2	2011	8	75%	2016/17	2024	$ 1,105,967
KIRKHAM RD	1.8	2008	8	38%	2015	2023	$ 323,698
LAKE FOREST DR	2.5	2003	8	-25%	2018	2026	$ 131,445
LIMBERTS RD	1.2	1997	8	-100%	2014	2022	$ 210,312
LONG LAKE ESTATES RD	5.1	2010	8	63%	2020/21	2028	$ 476,060
MEADOW CREST DR	1.2	1993	8	-150%	2014	2022	$ 210,312
McDOUGALL RD-ST	14.6	2012	8	88%	2016	2023	$ 2,658,923
OAKRIDGE RD & NORTH	3.1	2009	8	50%	2017	2025	$ 264,566
PINEWOOD DR	3.2	2010	8	63%	2017	2025	$ 273,101
SQUIRREL RD	0.6	2002	8	-38%	2014	2022	$ 105,156
SWALLOW RD	0.5	2002	8	-38%	2014	2022	$ 87,630
SYLVAN DR	0.4	1996	8	-113%	2015	2023	$ 71,933
WREN PLACE	0.1	2002	8	-38%	2014	2022	$ 17,526
BIG BENS RD	0.5	2006	8	13%	2014	2022	$ 87,630
BUNNY TRAIL RD	8.9	2011	8	75%	2019/20	2027	$ 810,425
LORIMAR LAKE RD	8.9	2013	8	100%	2013	2027	$ 678,180
MILLER DR	1.8	2008	8	38%	2015	2023	$ 323,698
PENINSULA SHORES. E&W	1.2	2008	8	38%	2015	2023	$ 215,798
						Total Surface Treatment Program	***$ 8,672,474***

Gravel Capital Renewals

Road	KMS	Year Installed	Standard Gravel Useful Life	Useful Life Remaining	First Resurfacing	Second Resurfacing	Replacement Cost w. Inflation
BURNSIDE BRIDGE RD GR	2.2	2010	8	63%	2019	2027	$ 38,940
HAINES RD	3.1	2010	8	63%	2018	2026	$ 134,850
NINE MILE RD	1.5	2003	8	-25%	2015	2023	$ 76,275
SCULLION RD	0.5	2009	8	50%	2017	2025	$ 35,850
SNOWDEN RD	0.7	1998	8	-88%	2015	2023	$ 34,965
TROUT LAKE RD	1.6	2012	8	88%	2015	2023	$ 79,920
LOCK ERIN RD	4.2	2007	8	25%	2015	2023	$ 209,790
LOCK ERIN SUMMER	3	2009	8	50%	2016	2024	$ 219,744
LORIMAR LAKE SUMMER	6	2010	8	63%	2014	2022	$ 291,600
WHITE BEAVER TRAIL	2.2	2009	8	50%	2018	2026	$ 95,700
						Total Gravel Program	***$ 1,217,634***

Municipality of McDougall

5.0 Fleet & Equipment

Asset Management Plan

January 2014

5.0 FLEET & EQUIPMENT

Contents

5.0 FLEET & EQUIPMENT

STATE OF INFRASTRUCTURE

5.1 Inventory

The Municipality's fleet and equipment inventory spans all Municipal departments. McDougall currently has 40 vehicles in its fleet and 263 pieces of equipment. Note that water works equipment is included in the perspective Asset Management Plans (Drinking, Leachate and Waste Water).

The current fleet inventory is broken down in Figure 5.1 and equipment inventory is shown in Figure 5.2. The source of the information is the Asset Inventory Registry. The Municipality referred to its Tangible Capital Asset Policy in determining the equipment to be included in this Plan. For analysis, the Municipality relied on internal knowledge of the system, and invoices.

Figure 5.1: Fleet Inventory Summary

Asset Type	Asset Component	Inventory
Central Fleet	Medium Trucks	2
	Light Trucks	6
	Snow Removal	4
	Construction Vehicles	7
	Waste Management Vehicles	5
	Property Maintenance Vehicles	2
	Ice Surface Vehicles	1
	Emergency Vehicles	8
	Trailers	5
	Total Vehicle Inventory	***40***

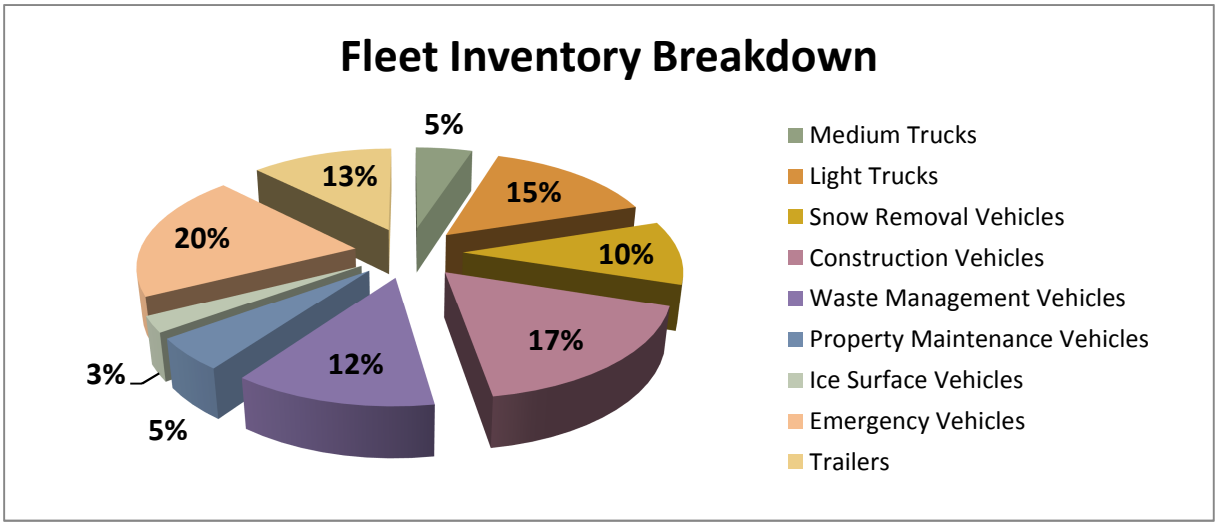
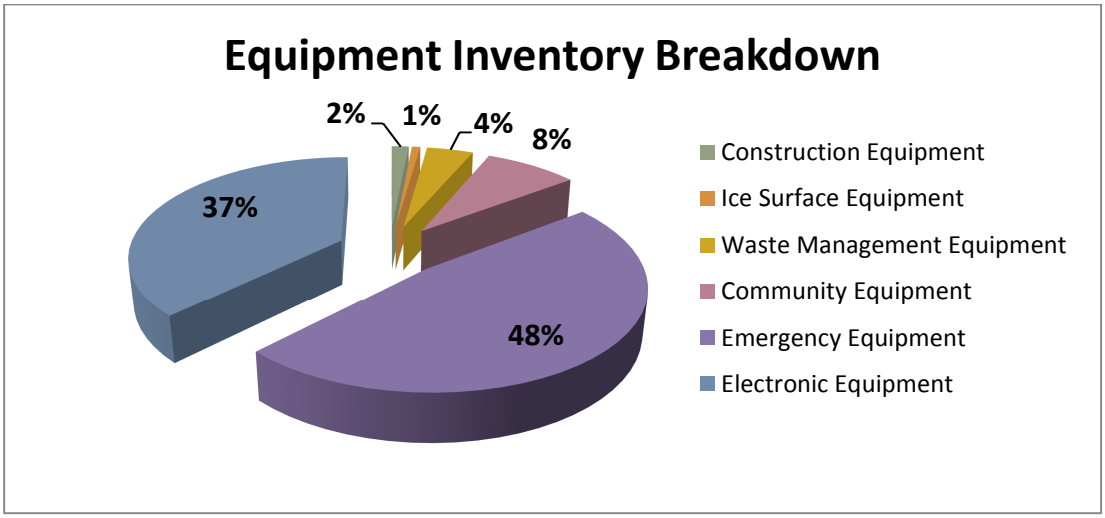


Figure 5.2: Equipment Inventory Summary

Asset Type	Asset Component	Inventory
Equipment	Construction Equipment	4
	Ice Surface Equipment	2
	Waste Management Equipment	11
	Community Equipment	22
	Emergency Equipment	126
	Electronic Equipment	99
	Total Equipment Inventory	***264***



5.2 Valuation

The historical cost of the fleet and equipment is shown at its carrying value on the Municipality's Capital Asset Summary without inflation.

The estimated replacement value of the asset is based on the purchase of the asset in the year of acquisition, inflated using CPI figures to 2013 values when replacement quotes were not available. The estimated current replacement value (2013) of the fleet and equipment is $6,037,519 or $2,318 per household in McDougall. Figure 5.3 shows the breakdown of historical and replacement costs for the fleet and Figure 5.4 shows the equipment.

5.0 FLEET & EQUIPMENT

Figure 5.3: Fleet Historical & Replacement Value

Asset Type	Asset Component	Historical Cost 2012	Replacement Value 2013	Percent of Replacement
Central Fleet	Medium Trucks	$177,322	$207,287	4.5%
	Light Trucks	$247,601	$254,143	5.5%
	Snow Removal	$718,145	$930,514	20.1%
	Construction Vehicles	$558,354	$750,580	16.2%
	Waste Management Vehicles	$979,021	$1,073,784	23.2%
	Property Maintenance Vehicles	$29,884	$28,000	0.6%
	Ice Surface Vehicles	$18,166	$16,000	0.3%
	Emergency Vehicles	$97,551	$1,303,000	28.2%
	Trailers	$32,010	$56,000	1.0%
	Total Vehicle Inventory	**$2,858,054**	**$4,619,308**	**100%**

Figure 5.4: Equipment Historical & Replacement Value

Asset Type	Asset Component	Historical Cost 2012	Replacement Value 2013	Percent of Replacement
Equipment	Construction Equipment	$119,551	$119,551	8.4%
	Ice Surface Equipment	$18,938	$18,000	1.3%
	Waste Management Equipment	$482,513	$621,560	43.8%
	Community Equipment	$7,398	$193,409	13.6%
	Emergency Equipment	$218,089	$338,500	23.9%
	Electronic Equipment	$137,387	$127,191	9.0%
	Total Equipment Inventory	**$983,876**	**$1,418,211**	**100%**

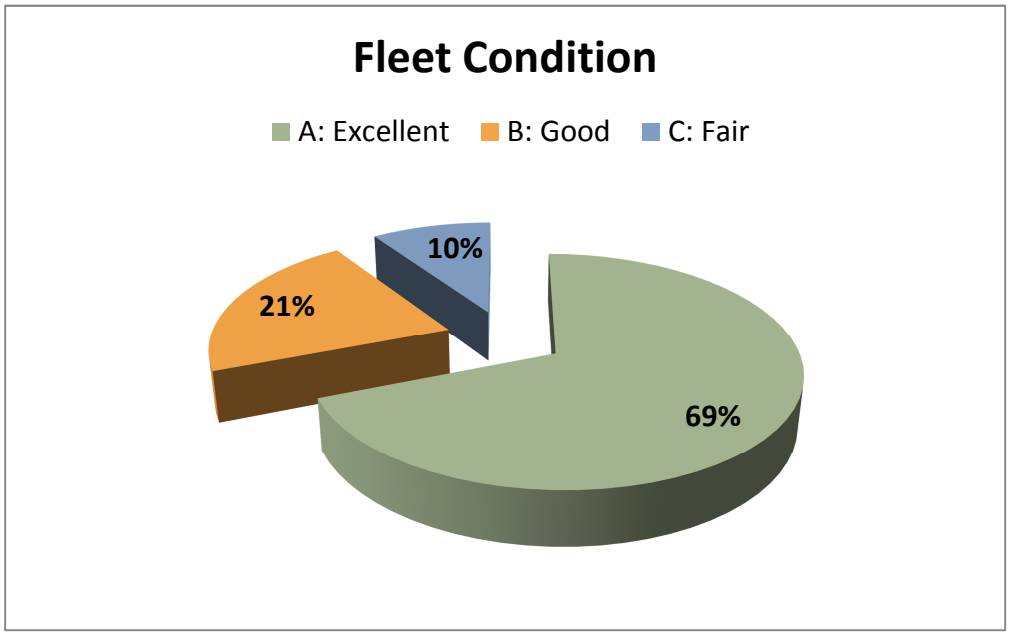
5.3 Condition Assessment

The fleet condition report in Figure 5.5 and equipment report in Figure 5.6 were developed by Municipal Staff with consideration of current legislative requirements. The Municipality chose to rely on Municipal Staff and Mechanic reports in determining the condition of the system due to the number of external variables and high degree of internal knowledge of the assets. Condition assessment criteria are available in the Appendix 1.0.

5.0 FLEET & EQUIPMENT

Figure 5.5: Fleet High Level Condition Assessment

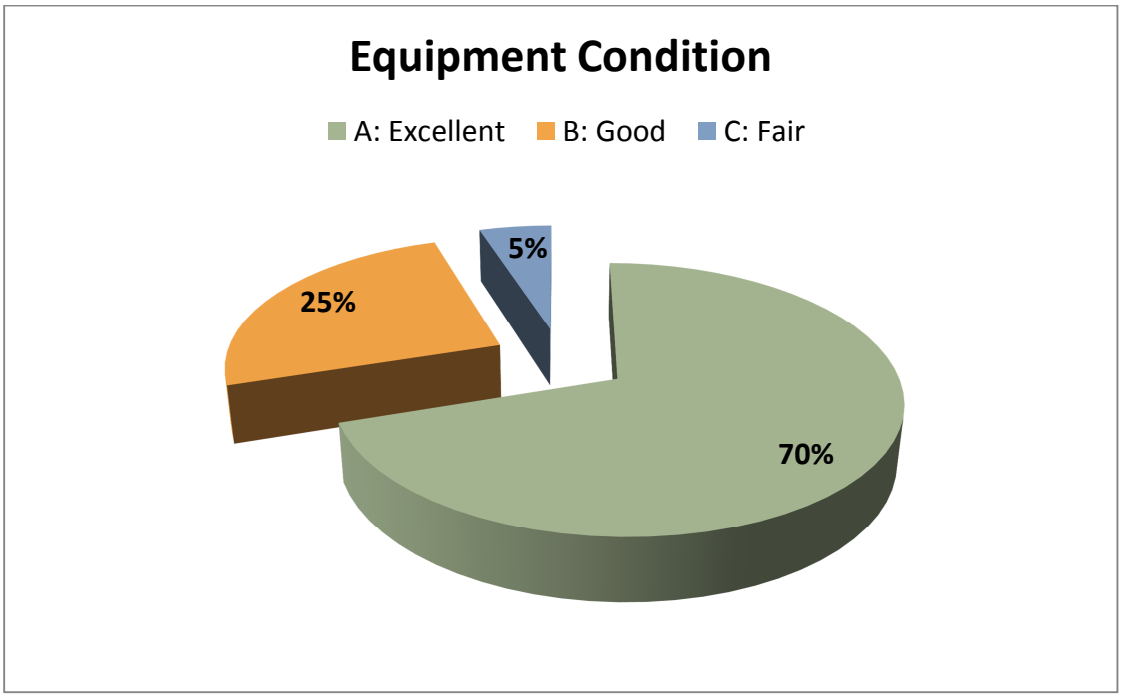
Asset Type	Asset Component	Condition
Central Fleet	Medium Trucks	A
	Light Trucks	A
	Snow Removal	B
	Construction Vehicles	A
	Waste Management Vehicles	B
	Property Maintenance Vehicles	B
	Ice Surface Vehicles	A
	Emergency Vehicles	A
	Trailers	A



5.0 FLEET & EQUIPMENT

Figure 5.6: Equipment High Level Condition Assessment

Asset Type	Asset Component	Condition
Equipment	Construction Equipment	A
	Ice Surface Equipment	A
	Waste Management Equipment	A
	Community Equipment	B
	Emergency Equipment	B
	Electronic Equipment	C



5.0 FLEET & EQUIPMENT

5.4 Lifecycle Activities

The fleet and equipment assets can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 5.7.

Figure 5.7: Fleet & Equipment Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: inspections, monitoring, cleaning, testing, etc.	75-100%
Major Maintenance	Unplanned maintenance & repair: repairing breaks, replacing parts, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: upgrading parts, re constructing parts, etc.	25 - 50%
Replacement	End of asset life: decommission, remove old asset and install a new asset that does the same job	0 -25%

5.5 Life Expectancy

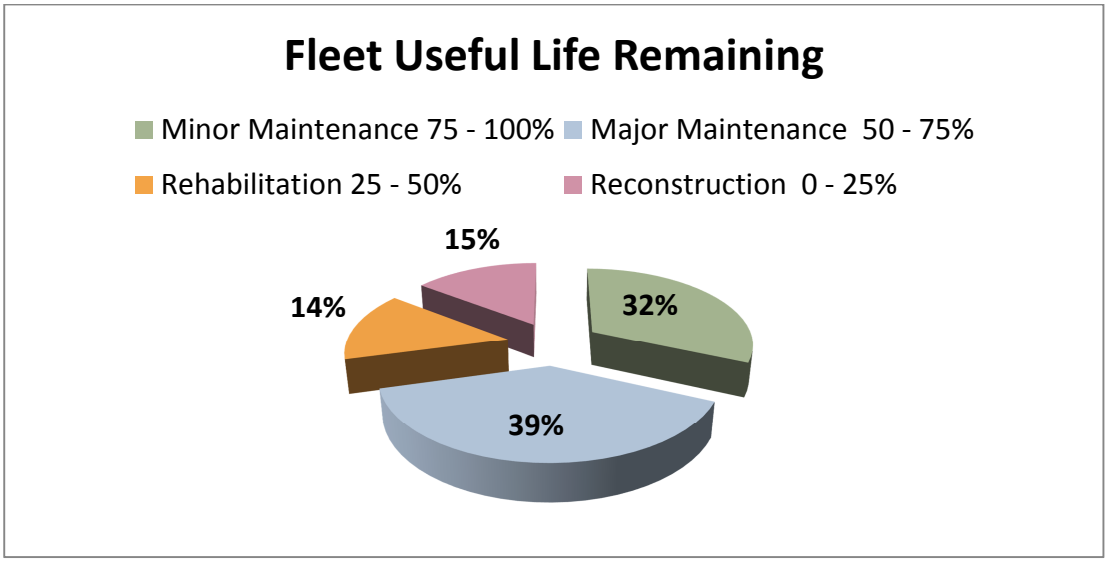
There are numerous direct and indirect variables that affect useful lives of vehicles and equipment such as climate, and maintenance practices. With this in mind, the Municipality chose to rely on Municipal Staff and Mechanic reports in gauging useful life and life remaining for McDougall's fleet and equipment.

Figure 5.8 shows the average useful life of the fleet assets; Figure 5.9 shows the remaining lives and the lifecycle activities that are being applied. Figures 5.10 and 5.11 show the average useful lives and activities for the equipment assets. Note electronic equipment is excluded from Figure 5.11 due to its short life span.

Figure 5.8: Fleet Useful Lives

Asset Type	Asset Component	Useful Lives
Central Fleet	Medium Trucks	15
	Light Trucks	10
	Snow Removal	10
	Construction Vehicles	21
	Waste Management Vehicles	18
	Property Maintenance Vehicles	10
	Ice Surface Vehicles	15
	Emergency Vehicles	24
	Trailers	16

Figure 5.9: Fleet Remaining Useful Life

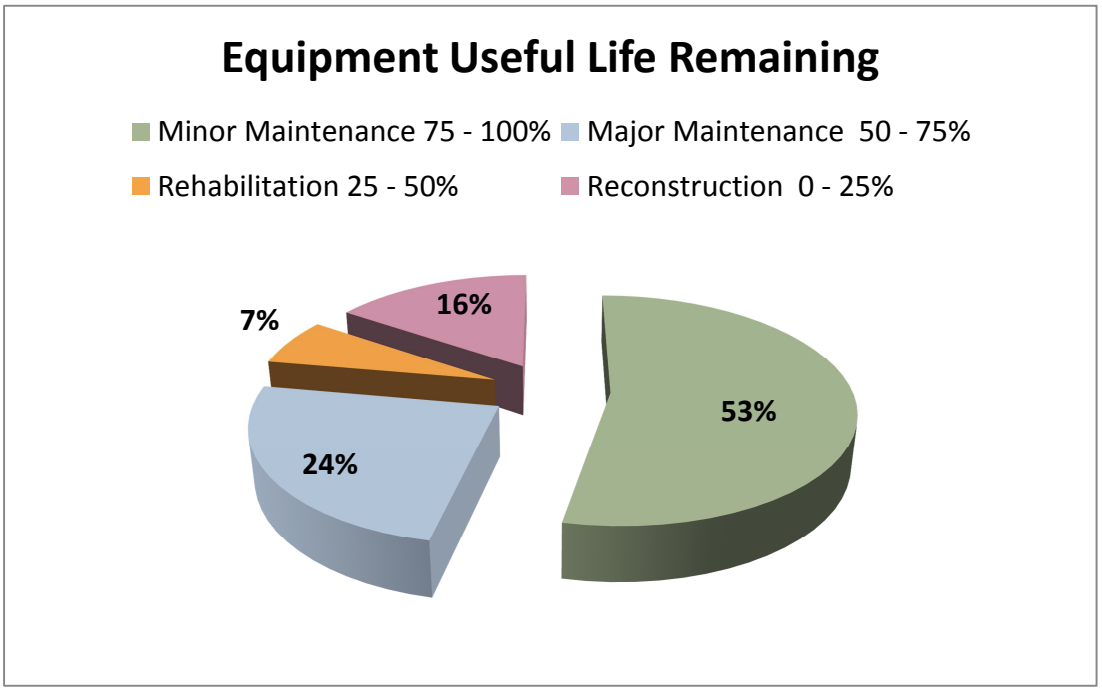


5.0 FLEET & EQUIPMENT

Figure 5.10: Equipment Useful Lives

Asset Type	Asset Component	Useful Lives
Equipment	Construction Equipment	11
	Ice Surface Equipment	18
	Waste Management Equipment	19
	Community Equipment	20
	Emergency Equipment	17
	Electronic Equipment	5

Figure 5.11: Equipment Remaining Useful Life



5.0 FLEET & EQUIPMENT

DESIRED LEVEL OF SERVICE

5.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 5.12 and 5.13 cover fleet and equipment. These figures identify target levels of service, and current performance relative to measures identified. Future demand drivers, forecasts and effects are discussed in the Asset Management Plan Introduction Section 8.0 and includes all of the assets covered in the plan.

5.0 FLEET & EQUIPMENT

Figure 5.12: Fleet & Equipment Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	Provide equipment and vehicles that are designed to ensure ease of use and efficiency.	Customer service complaints regarding efficiency of fleet and equipment operation.	2012- Minimal complaints.	0 complaints.
Reliability	Perform maintenance and services required.	Departmental requests for additional vehicles and equipment to expand services. Incidents of over or under servicing areas of the Municipality.	0 requests. 0 requests.	0 requests. 0 incidents.
Quality	Provide safe and reliable equipment and vehicles for intended purpose, as expected by public.	Number of customer service complaints related to equipment breakdowns.	2012- Minimal complaints	0 complaints.

5.0 FLEET & EQUIPMENT

Figure 5.13: Fleet & Equipment Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Ensure fleet & equipment is operating at an adequate level.	Annual condition and defect inspections.	2012- Daily inspections of equipment and fleet.	Daily inspections of equipment and fleet.
Maintenance	Ensure asset is kept in operable condition throughout its lifecycle.	Perform scheduled maintenance in accordance with manufacturer instructions.	2012 - 100% compliance	100% compliance with manufacturer instructions and timely attention to unscheduled maintenance.
Disposals	Ensure assets are disposed of when useful life has been exceeded.	Number of units with expired useful lives. Expected disposal proceeds received.	2012 – 4 vehicles & 4 pieces of equipment expired. 2012 -Greatest value obtained.	All disposals made when useful life is expired. Greatest value was obtained.
Renewal	Purchase equipment when useful life is expired.	Fleet and equipment useful lives should be increasing with renewals.	2012 avg. useful life fleet- 60% 2012 avg. useful life equipment- 77%	Fleet and equipment are replaced within their useful lives.
Upgrade/New	Purchase additional equipment to develop efficiencies.	Number of equipment efficiencies proposed solutions identified but not implemented.	2012 –unknown	All efficiencies achieved with new equipment.

5.0 FLEET & EQUIPMENT

ASSET MANAGEMENT STRATEGY

5.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Figure 5.14 identifies critical fleet and equipment assets.

Figure 5.14: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Emergency Fleet & Equipment	Provide safe, reliable, and efficient fire fighting vehicles and equipment.	• Unable to effectively fight fires and perform rescues. • Break downs. • Incorrect use. • Damage to other assets as result of malfunctioning equipment. • Injury or loss of life. • Loss of equipment.
2	Road Maintenance & Snow Removal Fleet & Equipment	Provide safe, dependable and efficient road maintenance and snow removal vehicles and equipment.	• Unable to effectively care for roads. • Break downs. • Incorrect use. • Damage to other assets as result of malfunctioning equipment. • Injury or loss of life. • Loss of equipment.
3	Remaining Fleet and Equipment Classes	Provide safe, efficient and reliable vehicles and equipment for the overall operation of the Municipality.	• Break downs. • Incorrect use. • Damage to other assets as result of malfunctioning equipment. • Injury or loss of life. • Loss of equipment.

5.8 Maintenance & Operations Plan

Maintenance Activities: includes all actions necessary for keeping assets at their operable capacity. These actions were previous discussed in Figure 5.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities: affect service levels by determining day to day servicing of the leachate system. These activities determine facility quality, life of equipment, etc.

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Undertaking capital activities through a planned replacement and renewal system**.**

5.0 FLEET & EQUIPMENT

5.9 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 1.10 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 5.15: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Total value represents the highest net value to Municipality	15%
Has highest age relative to assets in group	10%
Has high operational or maintenance costs	10%
Replacement cost is less than maintenance and/or operating cost	5%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

5.0 FLEET & EQUIPMENT

5.10 Disposal Plan

Disposal includes any activity associated with removing a decommissioned asset from the Municipality. These activities include sale, demolition or relocation to another department. The following procedures are followed by the Municipality when disposing of assets.

Surplus capital assets will be disposed of in the following manner:

- Disposals will be authorized by C.A.O and Management Staff
- Competitive bid process through a Request for Quotations
- Public auction

Invitations to bid on capital assets offered for sale by the Municipality will be:

- Posted on the Municipality's website for at least 14 days before the closing date of the invitation to bid
- Published in at least one edition of the local newspapers

5.11 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

5.12 Risks Involved with the Plan

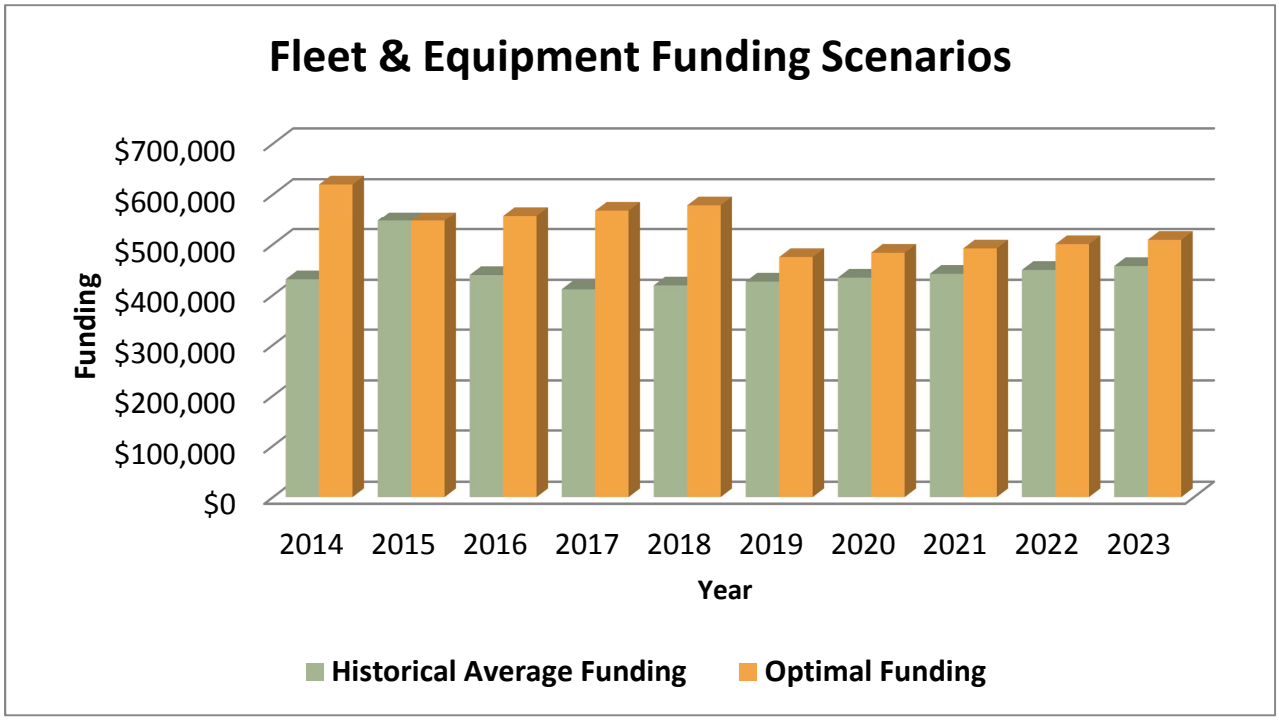
Optimal Capital Funding vs. Budgeted Capital Funding

Note that the computer system was not included in the Funding Scenarios nor is it included in any part of the Financing Strategy; an Electronic Asset Replacement Plan is being developed separately. The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the following two scenarios in Figure 5.16.

Scenario 1: Optimal funding for capital renewals, maintenance activities required by the fleet and equipment assets over the next 10 years is $5,329,883 this figure is inflated by 2% annually. An annual capital budget of $532,988 would be required to cover all expenses for the next 10 years. No contributions to the reserve or operation expenses are included in Scenario 1.

Scenario 2: Over the last three years the Municipality spent a total of $1,142,887 maintaining and renewing its fleet and equipment. Based on this average, McDougall projects an annual average budget of $445,760 with inflation. This budget does not provide sufficient funding to rehabilitate all assets that require work in the coming years. The scenario does not allow for any expansion. This funding shortfall is approximately $100,000 annually. No contributions to the reserve or operations expenses are included in Scenario 2.

Figure 5.16: Optimal vs. Budgeted Funding Strategies



What McDougall Cannot Do

The Municipality is not able to rehabilitate and replace all assets that require work in the coming years within budget. It cannot financially meet all the renewals and replacements required leaving some assets open to rapid deterioration while others can operate successfully beyond their useful lives. It is important that the Municipality operates a replacement strategy based on critical assets as discussed in section 5.7 to meet the essential needs in a priority sequence.

Service Consequences

Consequences occur when the Municipality decides not to undertake asset lifecycle activities after considering the strategies above. These consequences may impact users' service experience and are explored in Figure 5.17.

Figure 5.17: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o Increase in minor repair billings. o Stress on resources. o Reactive maintenance. o Decrease in operating efficiency and effectively.	o Scheduled regular inspections of minor assets. o Ensure critical parts are in stock. o Where possible purchase assets with extended warranties. o Renewal and maintenance programs.
Fleet and equipment assets will continue to deteriorate and will only be repaired if a breakage occurs.	o Increase in breakages o Service interruption o Safety risk to Public	o Routine, scheduled preventative maintenance on minor assets in poor condition and intensive monitoring.

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous sections. For data confidence information see Appendix 3.0.

5.13 Ten year Fleet & Equipment Expenditure Projections

The optimal expenditure forecast for the next 10 years is shown in Figure 5.18. It includes projections for renewal, and maintenance activities. Note that all costs are shown with 2% annual inflation on 2010 - 2012 values.

The total renewal, maintenance and replacement expenditure is $5,964,361 or $2,290 per McDougall household over the next 11 years. Note neither of these totals includes operating expense.

For comparative purposes Figure 5.19 shows fleet and equipment expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure 5.18: Projected Operating & Capital Expenditure

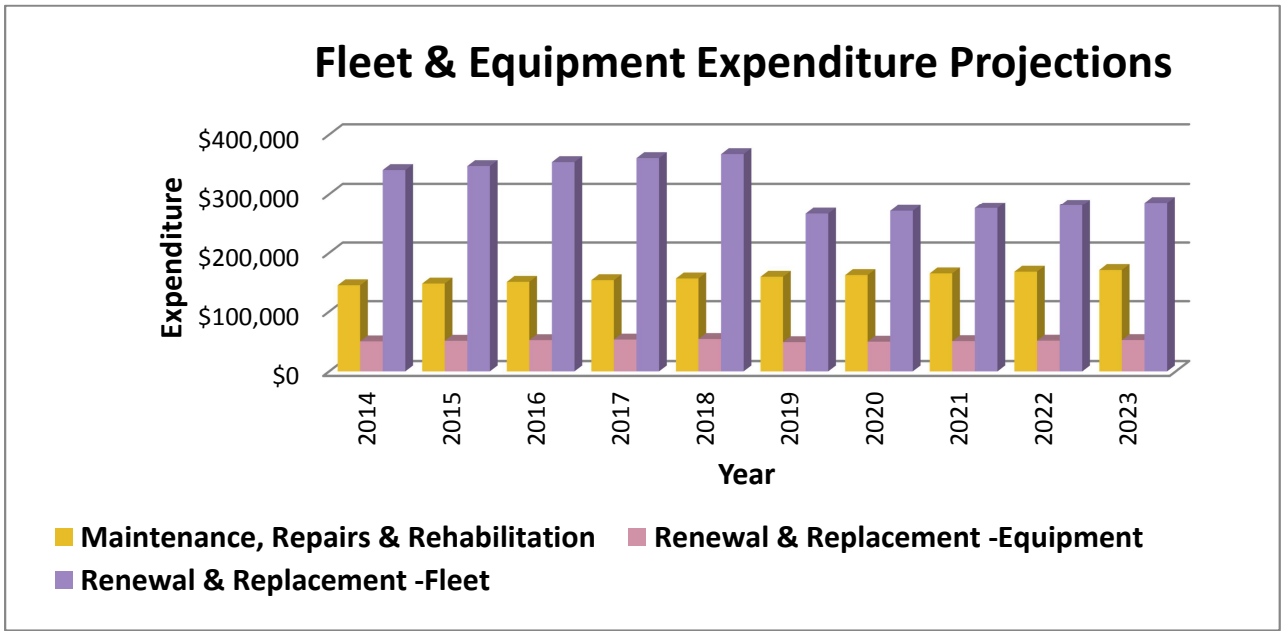
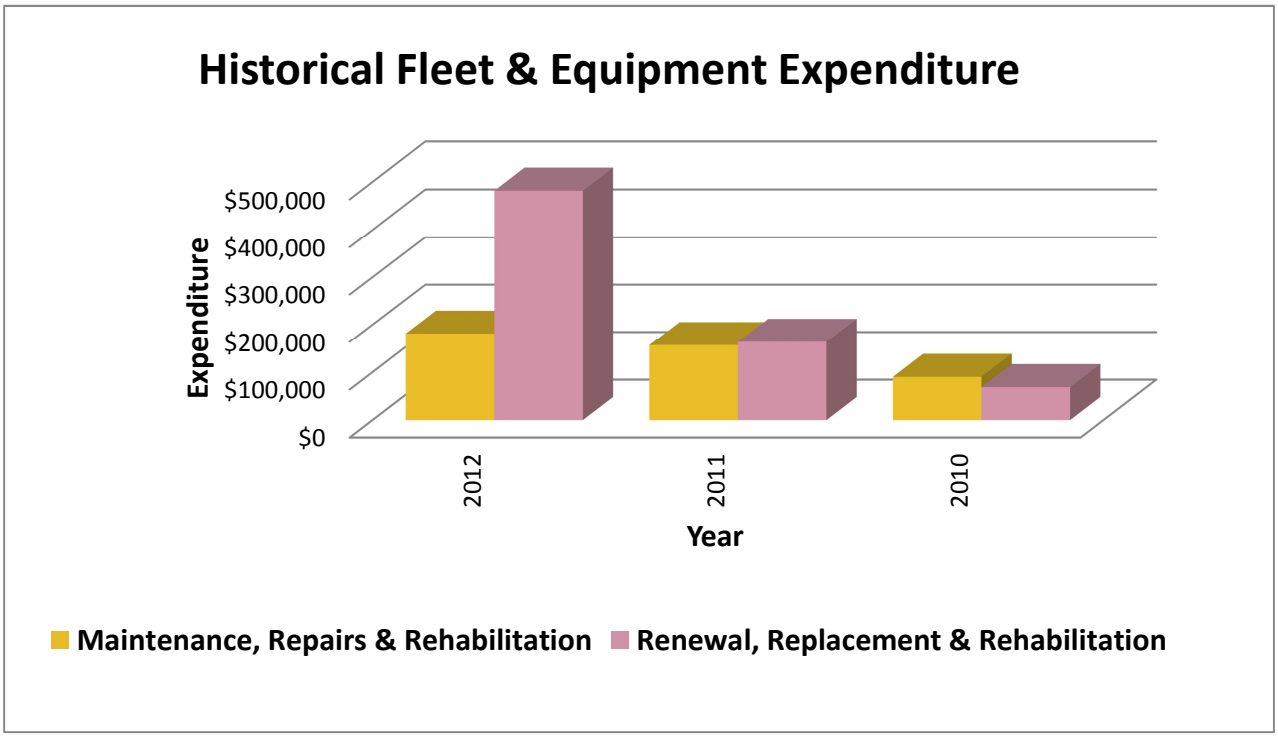


Figure 5.19: Historical Fleet & Equipment Expenditures



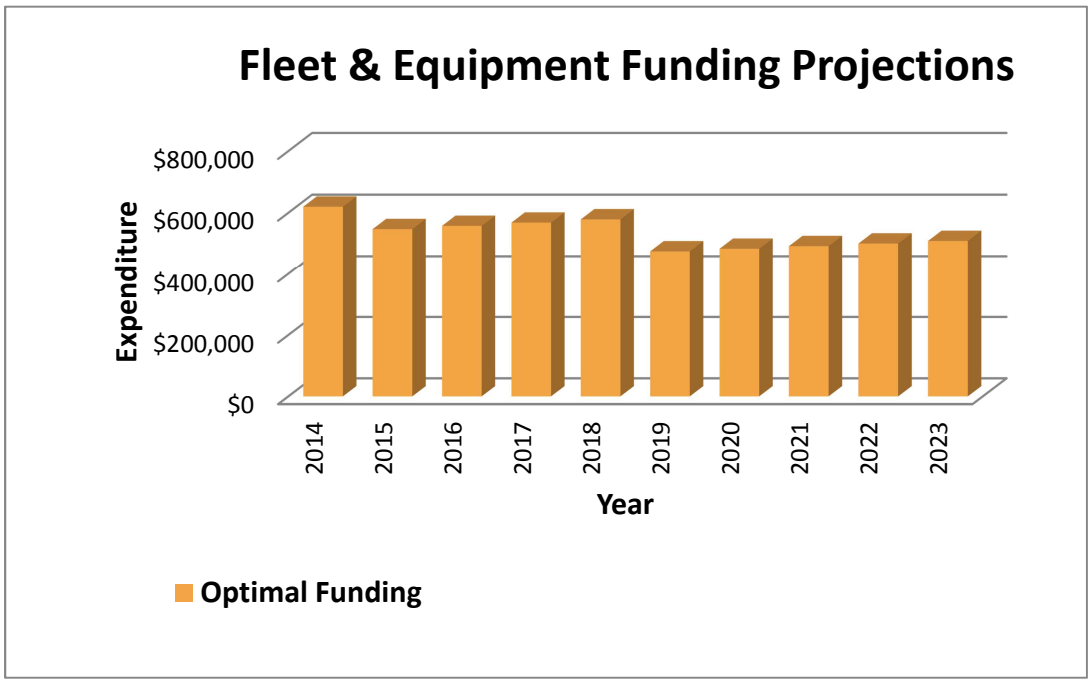
5.14 Fleet & Equipment Funding Projections

5.0 FLEET & EQUIPMENT

The optimal funding forecast for the next 11 years is shown in Figure 5.20. Funding requirements cover all renewal, replacement, and maintenance expenses. The fleet and equipment assets are an integral part of the Municipality however they do not generate significant direct revenues and are dependent on the net levy that is shared between multiple departments. All revenue allocated to fleet and equipment has been used to cover expenses. Note that projected revenues are shown with 2% annual inflation on 2010-2012 values.

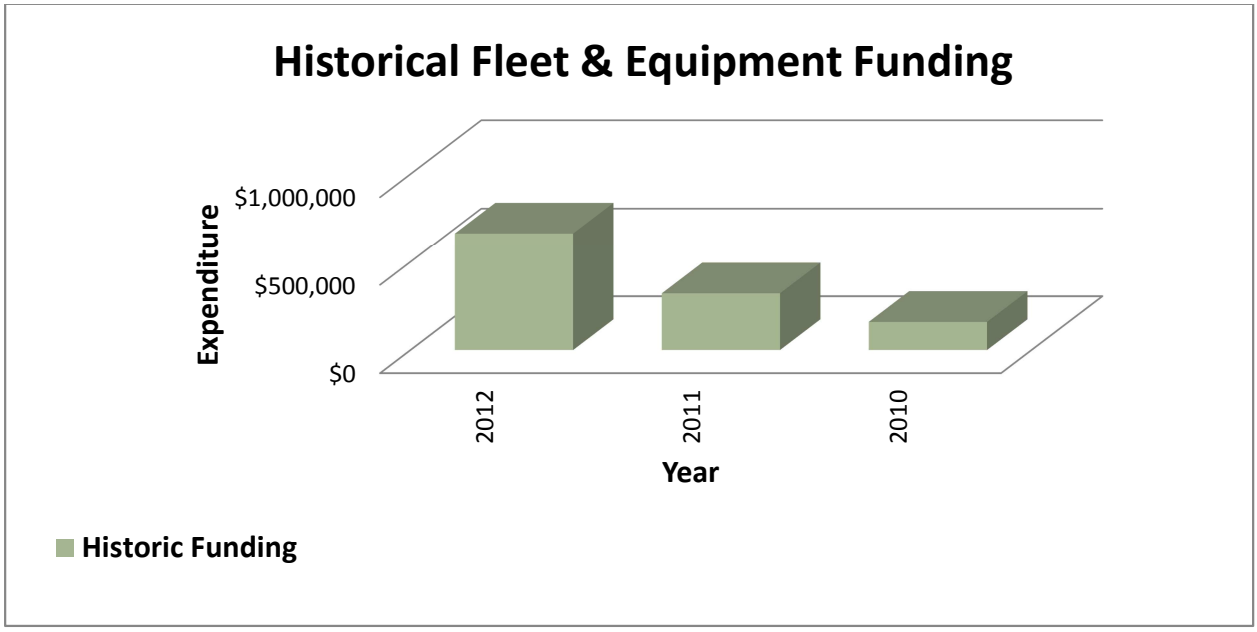
For comparative purposes Figure 6.16 shows net levy funds allocated to fleet and equipment activities from 2010 – 2012. Note that historical revenue is shown without inflation.

Figure 5.20: Fleet & Equipment Funding Projections



5.0 FLEET & EQUIPMENT

Figure 5.21: Historic Fleet & Equipment Funding



5.15 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the Fleet and Equipment Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio 81%

The ratio above indicates that all renewals are not fully funded for the next 11 years with the Asset Management Plan in place. The infrastructure gap is 19% wide.

5.0 FLEET & EQUIPMENT

APPENDIX

1.0 CONDITION ASSESSMENT CRITERIA

Fleet Condition Rating System	
A	**Excellent:** vehicle exterior and interior look new, and needs no reconditioning or repair. This vehicle is free of rust and will pass e-test and safety inspection. The engine is clean, with no fluid leaks and is free of visible defects. This vehicle has a clean operating history. An 'excellent' vehicle will need no reconditioning to be sold at retail.
B	**Good:** Vehicle is free of any major defects. The paint, body and interior have only minor areas of deterioration, and there are no major mechanical problems. Little or no rust on this vehicle. A "good" vehicle will need minor reconditioning and repair work to be sold at retail.
C	**Fair:** Vehicle has major defects - cosmetic and/or mechanical **BUT** is still in adequate running condition. The paint, body and/or interior have major areas of deterioration in addition to mechanical problems. A 'fair' vehicle will require major reconditioning to be sold at retail.
D	**Poor:** Vehicle has major defects - mechanical and/or cosmetic defects **AND** is in inadequate running condition. The vehicle has problems that cannot be easily repaired by mechanic on Staff (e.g. rusted through frame, fire damage). A 'poor' vehicle may require an independent appraisal to determine its value.

Equipment Condition Rating System	
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended
D	**Critical:** Extensive deterioration, barely functional.
F	**Failed:** No longer functioning.

Computer - Age Based Condition Index	
A	**Excellent:** 80 - 100% useful life remaining
B	**Good:** 60 - 79% useful life remaining
C	**Fair:** 40 - 60% useful life remaining
D	**Critical:** 20 - 40% useful life remaining
F	**Failed:** 20 % or less useful life remaining

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or not the service valuable to the public.

These performance measures include:

Purpose: Does the service satisfy users' needs?

Reliability: Does the service have the capability to maintain its functions on a routine basis?

Safety: Are the users protected from potential risks associated with the service?

Quality: Does the service fulfill its purpose to a high degree of excellence?

Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.

These activities affect the annual operating budget as the following performance measures:

Operations: routine activities that provide the service.

Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.

Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Maintenance Expenditure	B	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from asset registry, Municipal Staff recommendations and industry standards.
Asset Useful Lives	B	Based on Municipal Staff recommendations and industry standards.

5.0 FLEET & EQUIPMENT
4.0 FUNDING SCENARIOS – HISTORIC VS. OPTIMAL

Fleet & Equipment Financing	Scenario Two – Optimal Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Optimal Annual Budget	577,229	396,201	521,926	568,063	578,583	474,835	483,314	491,793	500,273	508,751	717,679
Reserve Draw Down	42,475	150,823	35,617	-	-	-	-	-	-	-	-
TOTAL REVENUE	**619,704**	**547,024**	**557,543**	**568,063**	**578,583**	**474,835**	**483,314**	**491,793**	**500,272**	**508,751**	**717,679**
OPERATION EXPENSE											
Operation Expense	-	-	-	-	-	-	-	-	-	-	-
CAPITAL EXPENSE											
Renewal & Replacement - Fleet	340,604	347,282	353,961	360,639	367,318	266,036	270,787	275,537	280,288	285,039	429,138
Renewal & Replacement - Equipment	50,215	51,200	52,184	53,169	54,154	48,831	49,703	50,575	51,447	52,319	114,290
Maintenance, Repairs & Rehabilitation	145,685	148,542	151,398	154,255	157,111	159,968	162,825	165,681	168,537	171,394	174,251
Non Infrastructure Solutions	-	-	-	-	-	-	-	-	-	-	-
Disposal Activities	-	-	-	-	-	-	-	-	-	-	-
Expansion Activities	-	-	-	-	-	-	-	-	-	-	-
RESERVE BULIDING											
Asset Replacement Reserve Contribution	8,200	-	-	-	-	-	-	-	-	-	-
Calculated Contribution	75,000	-	-	-	-	-	-	-	-	-	-
Contribution Smoothing %											
Contributed Reserve											
TOTAL EXPENSE	**619,704**	**547,024**	**557,543**	**568,063**	**578,583**	**474,835**	**483,314**	**491,793**	**500,272**	**508,751**	**717,679**
NET INCOME (deficit)	-	-	-	-	-	-	-	-	-	-	-

*** All figures shown in CAD $ **Inflation assumption is 2 % *** Forecasted revenues & expenditures based on 2010 -2013 average spending**

5.0 FLEET & EQUIPMENT

Fleet & Equipment Financing	Scenario Two – Historic Average Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Average Annual Budget	388,582	396,201	403,820	411,439	419,059	426,678	434,297	441,916	449,536	457,155	464,774
Reserve Draw Down	42,475	150,823	35,617	-	-	-	-	-	-	-	-
TOTAL REVENUE	**431,057**	**547,024**	**439,437**	**411,439**	**419059**	**426,678**	**434,297**	**441,916**	**449,536**	**457,155**	**464,774**
OPERATION EXPENSE											
Operation Expense	-	-	-	-	-	-	-	-	-	-	-
CAPITAL EXPENSE											
Renewal & Replacement - Fleet	340,604	347,282	353,961	360,639	367,318	266,036	270,787	275,537	280,288	285,039	429,138
Renewal & Replacement - Equipment	50,215	51,200	52,184	53,169	54,154	48,831	49,703	50,575	51,447	52,319	114,290
Maintenance, Repairs & Rehabilitation	145,685	148,542	151,398	154,255	157,111	159,968	162,825	165,681	168,537	171,394	174,251
Non Infrastructure Solutions	-	-	-	-	-	-	-	-	-	-	-
Disposal Activities	-	-	-	-	-	-	-	-	-	-	-
Expansion Activities	-	-	-	-	-	-	-	-	-	-	-
RESERVE BULIDING											
Asset Replacement Reserve Contribution	8,200	-	-	-	-	-	-	-	-	-	-
Calculated Contribution	75,000	-	-	-	-	-	-	-	-	-	-
Contribution Smoothing %											
Contributed Reserve											
TOTAL EXPENSE	**619,704**	**547,024**	**557,543**	**568,063**	**578,583**	**474,835**	**483,314**	**491,793**	**500,272**	**508,751**	**717,679**
NET INCOME (deficit)	**(188,647)**	**-**	**(118,106)**	**(156,624)**	**(159,524)**	**(48,157)**	**-49,017**	**-49,877**	**-50,737**	**-51,596**	**-252,905**

*** All figures shown in CAD $ **Inflation assumption is 2 % *** Forecasted revenues & expenditures based on 2010 -2013 average spending**

5.0 FLEET & EQUIPMENT
5.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM - Fleet

Asset Department	Asset Component	Useful Life	Life Remaining	2019 Renewals	2024 Renewals
Protection	PUMPER 1	20	0%	$293,000.00	-
	RESCUE 1	25	44%	$3,000.00	$200,000.00
	TANKER 1	25	80%	$3,000.00	-
	TANKER 2	25	56%	$2,000.00	-
	ATV	20	60%	$200.00	-
	SKI DOO	20	10%	$11,250.00	-
	COMMAND REHAB	15	73%	$500.00	$6,000.00
	EZLO BOAT TRAILER	20	25%	$3,050.00	
	RESCUE 2	20	55%	-	$131,000.00
	SQUAD 4	10	40%	$40,500.00	-
	PICK-UP TRUCK - BUILDING	10	0%	$32,542.00	-
Parks & Recreation	CHEVROLET SILVERADO	10	60%	$32,542.00	-
	KUBOTA TRACTOR-MOWING	10	70%	-	$16,000.00
	JOHN DEERE TRACTOR	10	-10%	$12,000.00	$12,000.00
Roads	FLOAT TRAILER	15	20%	34,000.00	-
	UTILITY TRUCK #57	10	90%		$77,286.86
	PLOW TRUCK #39	10	-20%	$245,000.00	$245,000.00
	PLOW TRUCK #52	10	60%	$245,000.00	-
	PLOW TRUCK #55	10	80%	-	$195,513.60
	PLOW TRUCK #49	10	30%	$245,000.00	-
	GRADER #37	20	30%	$275,000.00	-
	BACKHOE #53	10	60%	$139,500.42	-
	SANDER FOR PW002	15	60%	-	$10,343.58
	GMC SIERRA #56	10	90%	-	$51,432.89
	CHEVROLET SILVERADO #51	10	40%	$32,542.00	-
Environment	CHEVROLET SILVERADO #54	10	90%	-	$32,542.00
	GMC SIERRA W. CAP	10	100%	-	$32,542.00
	D3C BULLDOZER	20	35%	$20,000.00	$160,000.00
	4 X 4 GATOR	15	53%	-	$18,000.00
	Total Program			***$1,669,626.42***	***$1,187,660.93***

5.0 FLEET & EQUIPMENT
6.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM - Equipment

Asset Department	Asset Component	Useful Life	Life Remaining	2019 Renewals	2024 Renewals
Protection	THERMAL IMAGING CAMERA 1	12	25%	$8,000.00	-
	THERMAL IMAGING CAMERA 2	12	58%	-	$8,000.00
	SCBA (SELF CONTAINED BREATHING APP.) , 15 UNITS	15	40%	$80,000.00	-
	GENERATORS, 3 UNITS	20	90%	-	$20,000.00
	HURST HYDRAULIC ROAD CHAMP SYSTEM	20	15%	$30,000.00	-
	DEFIBRILLATOR 1	15	20%	$2,500.00	-
	DEFIBRILLATOR 2	15	67%	-	$6,000.00
	BUNKER SUITS & SAFETY EQUIPMENT, 40 UNITS	10	80%	-	$60,000.00
	RADIOS/PAGERS, 55 UNIT	10	70%	-	$33,000.00
Parks & Recreation	CRAWFORD PLAY STRUCTURE	20	-40%	$32,000.00	
	NOBEL BEACH PLAY STRUCTURE	20	35%		$5,000.00
	TAYLOR BEACH PLAY STRUCTURE	20	25%	$20,500.00	-
	BEAVER TRAIL PARK PLAY STRUCTURE	20	30%	$25,000	-
	STEEL FRAME COMMERCIAL DOCK	25	76%	$750.00	-
	FOAM BILLET DOCK	20	55%		$12,000.00
	BEACH HOUSE SECURITY CAMERA	5	20%	$3,130.78	$3,130.78
	MRC SECURITY CAMERA	5	20%	$5,000.00	$5,000.00
	FUEL UTILITY TANK	10	90%	-	12,510.28
	EMULSION TANK (FOR DURAPATCHER)	10	100%	-	44,081.00
Environment	LANDFILL SOLAR COMPACTORS, 2 UNITS	20	90%	$15,000.00	-
	TRANSFER STATION GARBAGE COMPACTORS, 2 UNITS	20	95%	$7,500.00	-
	TRANSFER STATION INFRASTRUCTURE (RETAINING WALL)	20	80%	$7,500.00	-
	LANDFILL CAMERA SYSTEM	5	20%	$9,271.82	$9,271.82
	Total Program			***$246,152.60***	***$217,993.88***

Municipality of McDougall

6.0 Buildings

Asset Management Plan

January 2014

6.0 BUILDINGS

Contents

6.0 BUILDINGS

6.0 BUILDINGS

STATE OF INFRASTRUCTURE

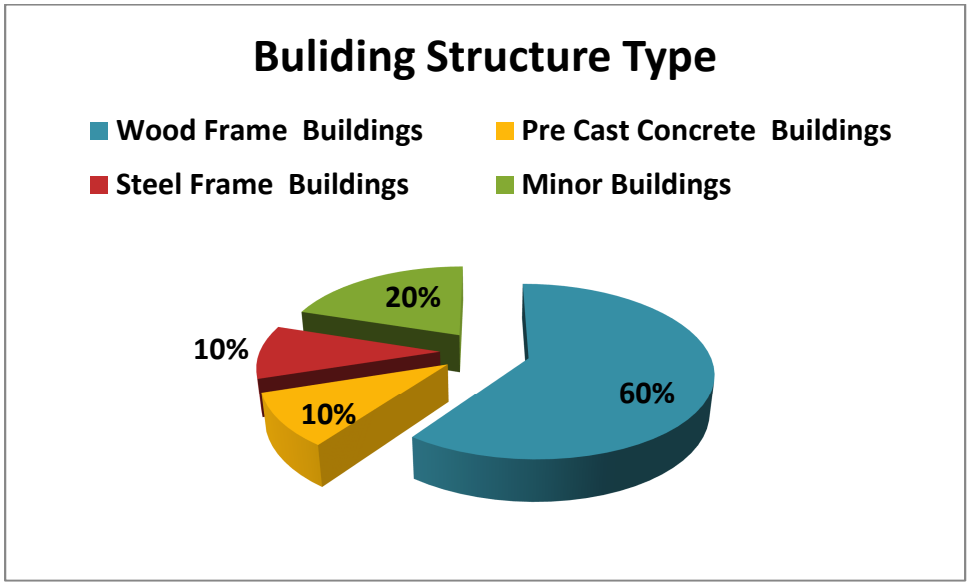
6.1 Inventory

The Municipality's buildings protect a variety of assets and provide community space for residents. McDougall currently owns 10 buildings excluding water works and Landfill buildings. Drinking water, leachate water, waste water and Landfill buildings are discussed in Asset Management Plans for water assets and are not covered in this Plan

The current inventory is broken down in Figure 6.1. The source of the information is the Asset Inventory Registry. For analysis, the Municipality relied on internal knowledge of the system, and contract documents.

Figure 6.1: Building Inventory Summary

Asset	Inventory
Wood Frame Buildings	6
Pre Cast Concrete Buildings	1
Steel Frame Buildings	1
Minor Buildings	2
Total Buildings	10



6.0 BUILDINGS

6.2 Valuation

The historical cost of the buildings is shown without inflation. These values reflect the purchase price in the year of acquisition, including any additions or renovations made to the buildings up to 2012.

The estimated replacement value of the buildings is based on historical cost, inflated using CPI figures to 2013 values. Building Department recommendations were also considered in determining replacement values. The estimated current replacement value of the buildings is $9,785,000 or $3,758 household in McDougall. Figure 6.2 shows the breakdown of historical and replacement costs.

Figure 6.2: Building Historical & Replacement Value

Asset	Historical Cost 2012	Replacement Value 2013	Percent of Replacement
Wood Frame Buildings	$2,050,521	$6,670,000	68%
Pre Cast Concrete Buildings	$89,644	$250,000	3%
Steel Frame Buildings	$1,351,486	$2,800,000	28%
Minor Buildings	$77,864	$65,000	1%
Total Value	**$3,569,546**	**$9,785,000**	**100%**

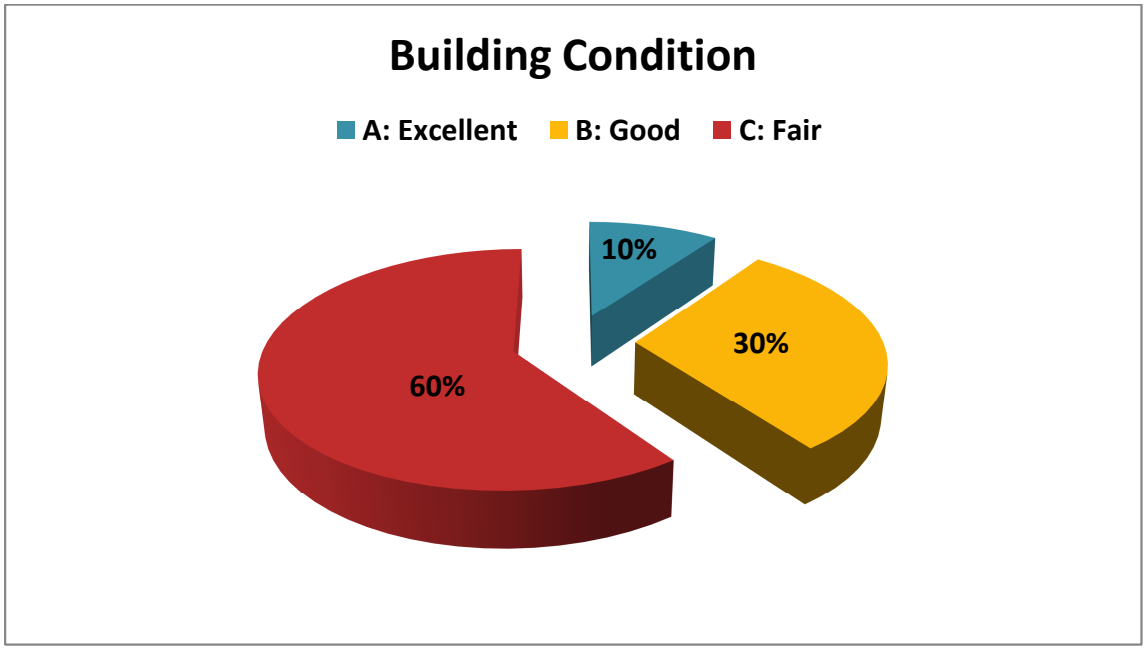
6.0 BUILDINGS

6.3 Condition Assessment

The condition report in Figure 6.3 was developed by Municipal Staff with consideration of current legislative requirements. The Municipality chose to rely on Municipal Staff in determining the condition of the system due to the number of external variables and high degree of internal knowledge of the buildings. Condition assessment criteria are available in the Appendix 1.0.

Figure 6.3: Building High Level Condition Assessment

Asset	Condition
Wood Frame Buildings	C
Pre Cast Concrete Buildings	A
Steel Frame Buildings	C
Minor Buildings	C



6.0 BUILDINGS

6.4 Lifecycle Activities

Buildings can be split into four categories of life with corresponding asset management activities. These activities are described in Figure 6.4.

Figure 6.4: Building Lifecycle Activities

Activity	Definition	Life Remaining
Minor Maintenance	Planned activities: inspections, monitoring, cleaning, testing, etc.	75-100%
Major Maintenance	Unplanned maintenance & repair: repairing breaks, replacing components, etc.	50 - 75%
Rehabilitation	Upgrades & rehabilitation: upgrading components, re constructing components, etc.	25 - 50%
Replacement	End of asset life: decommission, remove old asset and build a new asset that does the same job	0 - 25 %

6.0 BUILDINGS

6.5 Life Expectancy

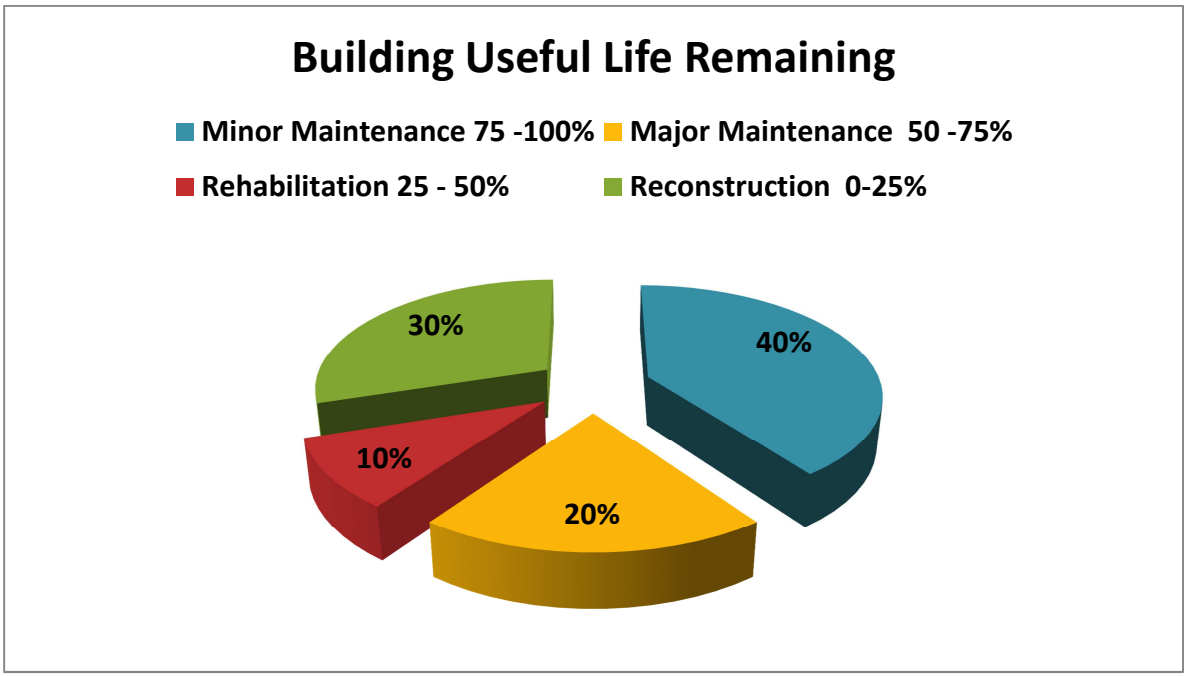
There are numerous direct and indirect variables that affect useful lives of buildings such as climate, building material, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff and Engineering reports in gauging useful life and life remaining for McDougall's buildings.

Figure 6.5 shows the useful life of the buildings; Figure 6.6 shows the remaining lives and the lifecycle activities that are being applied.

Figure 6.5: Building Useful Life

Asset	Useful Life
Wood Frame Buildings	50
Pre Cast Concrete Buildings	60
Steel Frame Buildings	60
Minor Buildings	30

Figure 6.6: Building Remaining Useful Life



6.0 BUILDINGS

DESIRED LEVEL OF SERVICE

6.6 Target Levels of Service

The service levels in this plan are defined by two overarching performance measures community and operational.

Community Levels of Service: Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

Operational Levels of Service: Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value**.**

Figures 6.7 and 6.8 cover buildings. These figures identify target levels of service, and current performance relative to measures identified. Future demand drivers, forecasts and effects are discussed in the Asset Management Plan Introduction Section 8.0 and includes all of the assets covered in the plan.

6.0 BUILDINGS

Figure 6.7: Building Community Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Purpose	To provide safe, clean buildings.	Customer service complaints relating to safety and cleanliness.	2 complaints recorded that were verified.	3 complaints.
Reliability	Ease of accessibility, (parking, signage, etc.) and overall experience at facilities.	Customer complaints regarding accessibility and experience.	0 complaints recorded.	1 complaint
Capacity	Building capacity meets or exceeds demand.	Customer complaints regarding lack of facility space.	0 complaints recorded.	0 complaints.

6.0 BUILDINGS

Figure 6.8: Building Operational Levels of Service 2012

Performance Measure	Level of Service Objective	Performance Measure Process	2012 Performance Measured	Desired Level of Service
Operations	Buildings are well managed.	Buildings inspections. Building cleaning schedule.	Maintain a daily log book for each facility for inspections and cleanings.	Weekly inspections. Daily scheduled cleaning when in use.
Maintenance	Respond to customer requests for service and perform maintenance activities.	Reactive and general maintenance is undertaken within a reasonable timeframe.	Maintain a daily log book for each facility for maintenance.	Maintenance activities are completed within 1 day of becoming aware of issue (dependant on complexity).
Renewal	Buildings meet or exceed user needs.	Useful lives of buildings should be increasing with renewals. Customer requests for facility upgrades. Renewals should include providing accessibility.	2012 average useful life – 56%. MRC at 4% of useful life. 0 Customer requests for facility upgrades. 2012 – 1 critical building meets legislation (MRC).	Building components are replaced within operating life cycles. 1 Customer requests for facility upgrades. Buildings should be accessible to all residents.
Upgrade/New	Construction of new facilities.	Residents have adequate Community facilities.	Dept. head reviews facility needs annually based on vision and community requests - none at present.	0 Customer requests for additional buildings.

6.0 BUILDINGS

ASSET MANAGEMENT STRATEGY

6.7 Non Infrastructure Solution – Asset Hierarchy

An asset hierarchy provides a base for planning renewal, maintenance and rehabilitation. The structure allows the Municipality to focus its resources on assets that have been identified as critical assets. These assets have a high consequence of failure but not necessarily high risk of failure. Since not all assets can be maintained at the desired level of service prioritizing work on critical assets over low risk ones ensures that the system is protected against the most severe risks. Implementation of this strategy in the planning process has inherent cost savings and efficiencies. Figure 6.9 identifies critical building assets.

Figure 6.9: Critical Assets

Ranking	Service Hierarchy	Service Level Objective	Critical Risk
1	Fire Halls	Protect emergency equipment. Provide safe buildings that fall within Building Code.	• Loss of electricity. • Loss of water service. • Building becomes unsafe. • Staff is unable to access emergency equipment. • Loss of life and/or equipment.
2	Public Works Building	Protect snow removal and road maintenance fleet. Provide safe buildings that fall within Building Code.	• Loss of electricity. • Loss of water service. • Building becomes unsafe. • Staff is unable to access roadway fleet. • Loss of life and/or equipment.
3	Municipal Office	Protect electronic equipment and important documents. Provide safe buildings that fall within Building Code.	• Loss of electricity. • Loss of water service. • Building becomes unsafe. • Staff is unable to access electronic equipment and documents. • Loss of life and/or equipment.

6.0 BUILDINGS

6.8 Maintenance & Operations Plan

Maintenance Activities: includes all actions necessary for keeping assets at their operable capacity. These actions were previously discussed in Figure 6.4 relative to useful life remaining.

Reactive Maintenance: unplanned repair work carried out in response to service request, break down or disruption.

Planned Maintenance: identified repair work indicated by the asset's useful life remaining in the Asset Inventory Registry. These activities include inspection, assessing condition based on asset's past performance, scheduling and tracking work to establish a centralized maintenance history and improve service delivery data collection.

Operational Activities: affect service levels by determining day to day servicing of the buildings. These activities determine facility quality, life of equipment, etc.

The Municipality will operate and maintain assets to the desired level of service identified above. These activities will be within approved budgets. Strategies being considered include:

- Annual inspections to determine up to date condition status, maintenance and planned renewals for incorporation into the annual Budget.
- Scheduling maintenance activities in a priority sequence to ensure that the highest risk assets are addressed before lower risk assets.
- Maintaining the Asset Inventory Registry.
- Maintaining service risk and mitigation strategy database.
- Undertaking capital activities through a planned replacement and renewal system**.**

6.0 BUILDINGS

6.9 Renewal & Replacement Plan

The Municipality will undertake renewal and replacement activities to maintain desired levels of service and minimize infrastructure related risks. The following Figure 6.10 criteria will act as McDougall's guide to determining whether major work on an asset should be considered.

Figure 6.10: Capital Planning Tool

Criteria	Weighting
High consequence of failure	20%
High utilization	20%
Identified in critical asset hierarchy	15%
Total value represents the highest net value to Municipality	10%
Has highest age relative to assets in group	10%
Has high operational or maintenance costs	10%
Replacement cost is less than maintenance and/or operating cost	10%
Where replacement with modern equivalent asset would yield material savings	5%
Total	**100%**

6.0 BUILDINGS

6.10 Disposal Plan

Disposal includes any activity associated with removing a decommissioned asset from the Municipality. These activities include sale, demolition or relocation to another department. The following procedures are followed by the Municipality when disposing of assets.

Surplus capital assets will be disposed of in the following manner:

- Disposals will be authorized by C.A.O and Management Staff
- Competitive bid process through a Request for Quotations
- Public auction

Invitations to bid on capital assets offered for sale by the municipality will be:

- posted on the municipality's website for at least 14 days before the closing date of the invitation to bid
- published in at least one edition of the local newspapers

6.11 Procurement Methods

The Municipality will refer to its internal Procurement Policy (By-Law 2007-09) and Tender Policy (By-Law 2007-10) when purchasing new assets. McDougall will endeavor to where possible follow sustainable purchasing strategies and consider costs based on the lifecycle of the asset.

6.12 Risks Involved with the Plan

Optimal Capital Funding vs. Budgeted Capital Funding

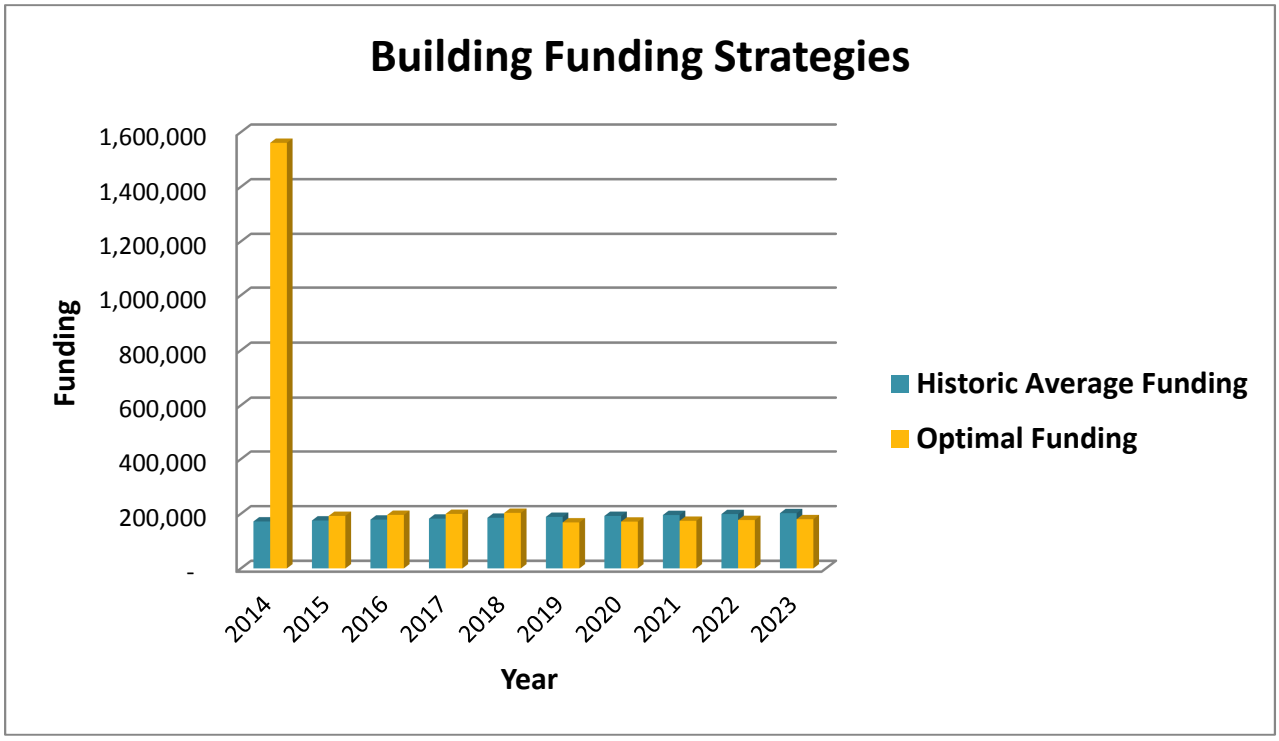
The Municipality has adopted this Asset Management Plan to obtain efficiency in operation. The decision to pursue the Plan was based on the following two scenarios in Figure 6.11.

Scenario 1: Optimal funding for capital renewals, maintenance and operation activities required by the building assets over the next 10 years is $3,221,779 this figure is inflated by 2% annually. Renewals and replacements include approximately $1,307,000 (Administration Office replacement) and $183,380 of general renewals over the next 10 years in addition to operation expense. No contributions to the reserve are included in Scenario 1.

Scenario 2: Over the last three years the Municipality spent an annual total of $505,326 operating, maintaining and renewing the buildings (excluding expansion activities). Based on this average, McDougall projects an annual average budget $186,971. This budget provides sufficient funding to rehabilitate assets that require work in the coming years. The scenario does not allow for any expansion or building replacement when asset lives are exceeded. This funding shortfall will leave the

Administration Office (useful life of 50 years, exceeded in 2005) open to rapid deterioration and potential liability. No contributions to the reserve are included in Scenario 2.

Figure 6.11: Optimal vs. Budgeted Funding Strategies



What McDougall Cannot Do

The Municipality is able to rehabilitate assets that require work in the coming years; however it cannot financially meet the backlogged need for a new Administration Office (Scenario 2). The Administration Office exceeded its 50 year life in 2005 and will cost approximately $1,307,000 to replace. McDougall will continue the Administration Office's Health & Safety monitoring and maintenance programs. It will also consult with Engineers about life expectancy projections, possible extensions and building alternatives. Plans are in place to renovate the Administration building to be accessible to all residents.

Service Consequences

Consequences occur when the Municipality decides not to undertake asset lifecycle activities after considering the strategies above. These consequences may impact users' service experience and are explored in Figure 6.12.

Figure 6.12: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	o Increase in minor repair billings. o Stress on resources. o Reactive maintenance. o Increase in customer complaints.	o Regular inspections of minor assets.
Buildings will continue to deteriorate and will only be repaired if a breakage occurs.	o Increase in breakages. o Service interruption. o Safety risk to Public.	o Routine, scheduled preventative maintenance on minor assets in poor condition and intensive monitoring.

FINANCING STRATEGY

This section contains the financial requirements of the Asset Management Plan discussed in the previous sections. For data confidence information see Appendix 3.0.

6.13 Ten year Building Expenditure Projections

The optimal expenditure forecast for the next 10 years is shown in Figure 6.13. It includes projections for operating, renewal, and maintenance activities. Note that all costs are shown with 2% annual inflation on 2010 - 2012 values.

The total renewal and maintenance expenditure excluding asset replacement is $542,310 or $208 per McDougall household over the next 10 years. With replacement of the Administration Office the total is $1,912,316 or $734 per household. Note neither of these totals includes operating expense which is projected to be between $120,000 and $150,000 annually.

For comparative purposes Figure 6.14 shows building expenditures from 2010 to 2012. Note that all costs are shown without inflation.

Figure 6.13: Projected Operating & Capital Expenditure

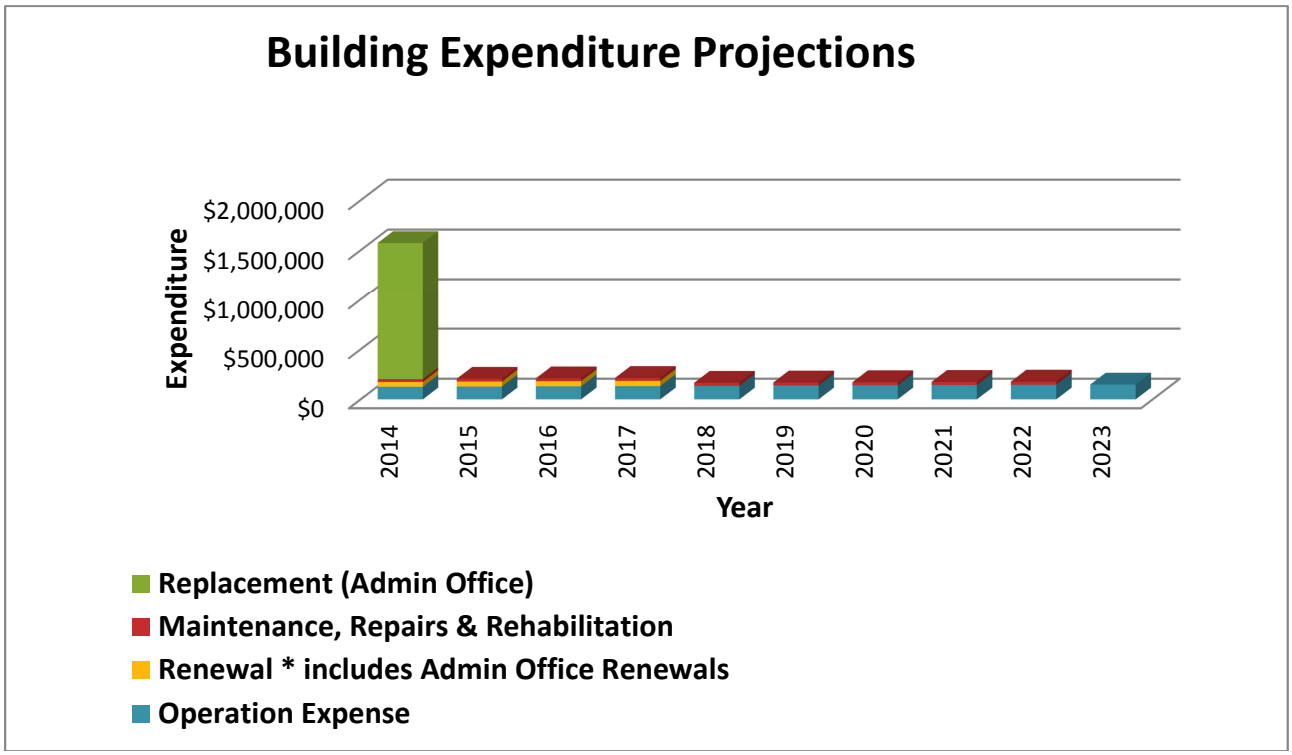
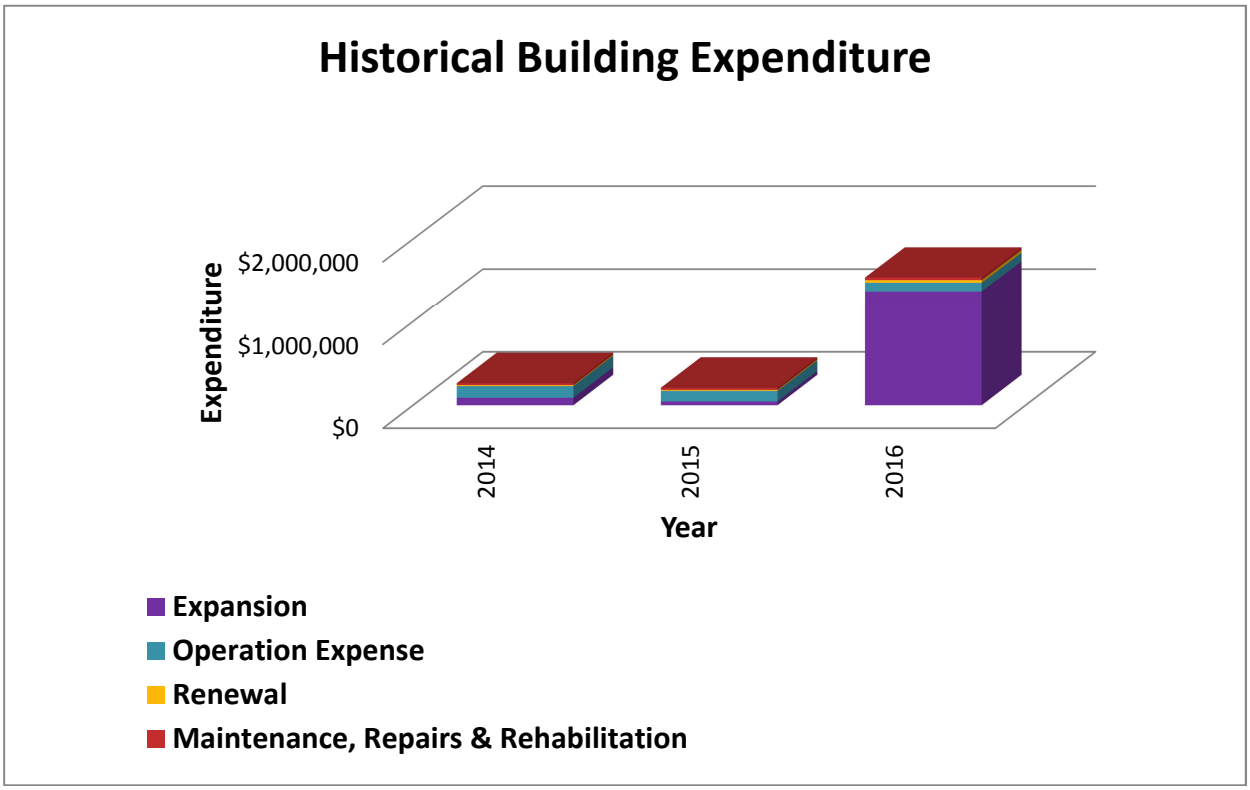


Figure 6.14: Historical Building Expenditures



6.0 BUILDINGS

The Municipality will not continue its expansion activities into the next 10 years. Instead McDougall will focus on renewing buildings. Efforts will also be undertaken to gauge a better understanding of building life expectancy and extension activities.

In the past the Municipality has not invested in reserves for buildings. Looking at future projections reserve contributions are necessary to maintain service delivery standards in the future and provide building replacements.

6.14 Building Funding Projections

The optimal funding forecast for the next 10 years is shown in Figure 6.15. Funding requirements cover all renewal, replacement, maintenance, and operating expenses. Buildings are an integral part of the Municipality however they do not generate significant direct revenues and are dependent on the net levy that is shared between multiple departments. All revenue allocated to buildings has been used to cover expenses. Note that projected revenues are shown with 2% annual inflation on 2010-2012 average values.

For comparative purposes Figure 6.16 shows net levy funds allocated to building activities including expansion from 2010 – 2012. Note that all revenues are shown without inflation.

Figure 6.15: Building Funding Projections

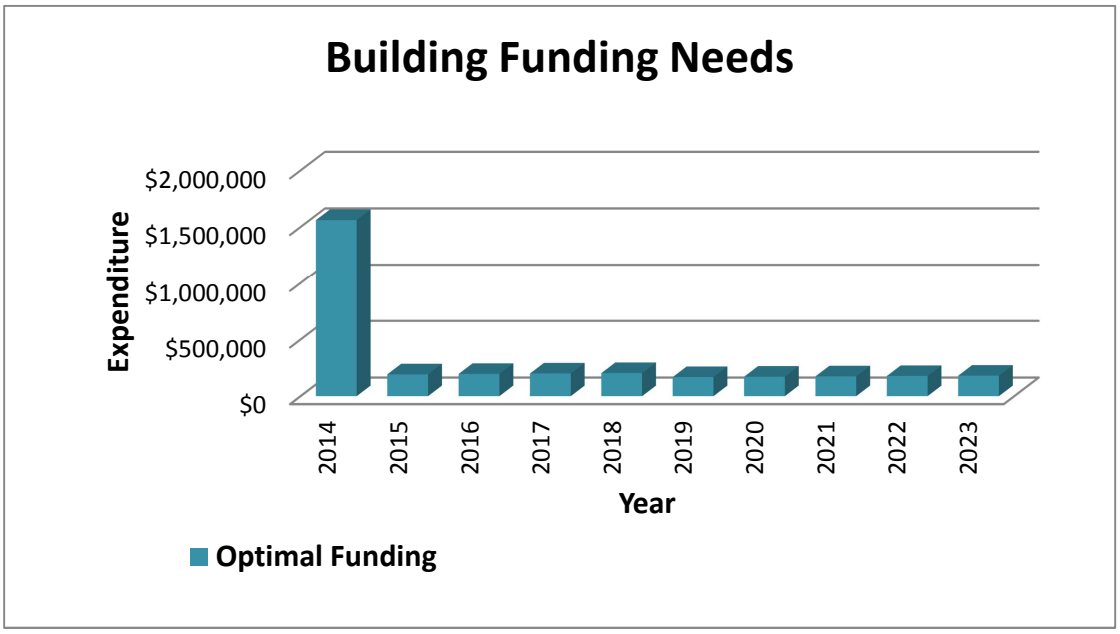
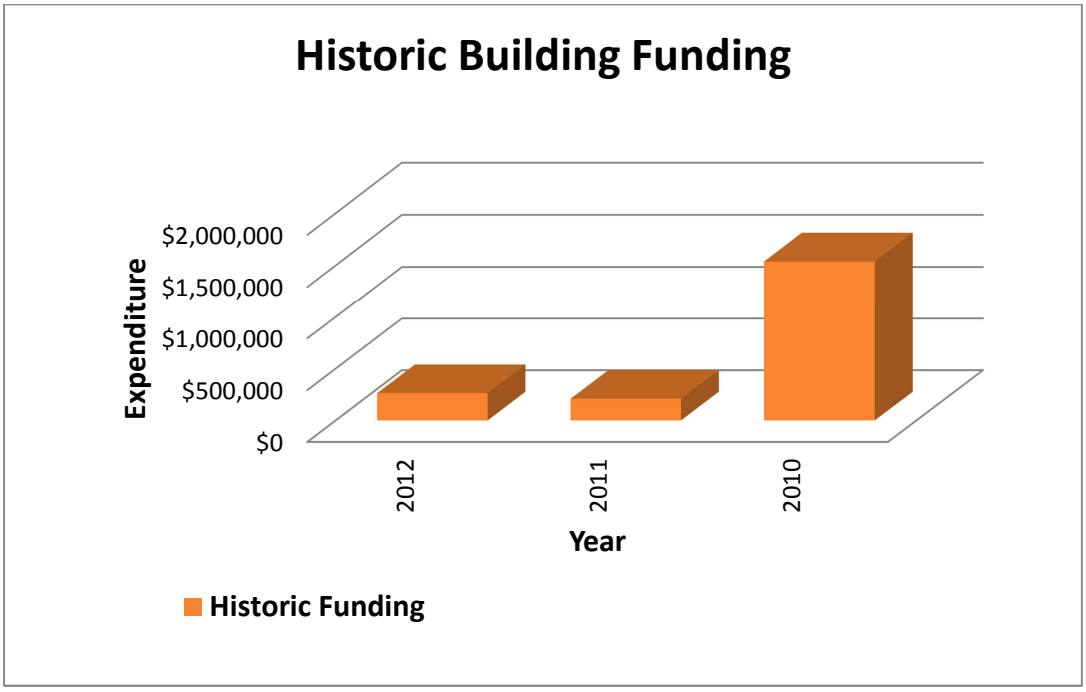


Figure 6.16: Historic Building Funding



6.15 Sustainability of Service Delivery

The key indicator for service delivery sustainability that has been considered in the financing of the building Asset Management Plan is the asset renewal funding ratio. This ratio is the most important indicator. It reveals how much of the capital renewals the Municipality will be able finance and how big the infrastructure gap is.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio 61%

The ratio above indicates that all renewals are not fully funded for the next 10 years with the Asset Management Plan in place. The infrastructure gap is 39% wide and is attributable to the Administration Office's need for replacement.

6.0 BUILDINGS

APPENDIX
1.0 CONDITION ASSESSMENT CRITERIA

Condition		
A	**Excellent:** no noticeable defects, some aging or wear may be visible. Immediate action is not required.	Normal PM
B	**Good:** Only minor deterioration or defects are evident. Immediate action is not required.	Normal PM + Minor M.
C	**Fair:** Some deterioration or defects are visible; function is still adequate. Analysis of repair and/or replacement options is recommended.	Normal PM + Major M.
D	**Critical:** Extensive deterioration, barely functional. Immediate action required.	Major Repair + Rehab.
F	**Failed:** No longer functioning. Immediate action required	Rehab. Unlikely = Replace

2.0 LEVELS OF SERVICE CRITERIA

Current Levels of Service

The service levels in this plan are defined by two overarching performance measures: community and operational. These performance measures will enable McDougall to track its progress against targeted outcomes and use those results to improve the Municipality's service delivery.

Community Levels of Service:

Community levels of service indicate how the community perceives the service and determines whether or not the service is valuable to the public.

These performance measures include:

Purpose: Does the service satisfy users' needs?

Reliability: Does the service have the capability to maintain its functions on a routine basis?

Safety: Are the users protected from potential risks associated with the service?

Quality: Does the service fulfill its purpose to a high degree of excellence?

Capacity: Is the service at, under or over its capacity?

Operational Levels of Service

6.0 BUILDINGS

Operational levels of service are the technical activities that bring community levels of service into action. They include resource allocations to create and maintain service levels that users expect and value.

These activities affect the annual operating budget as the following performance measures:

Operations: routine activities that provide the service.

Maintenance: routine activities that keep the infrastructure functioning at the desired level of service.

Renewal: non-routine activities that extend the useful life of an infrastructure asset at the desired level of service.

Upgrade: non-routine activities that raise the level of service that the infrastructure can provide.

3.0 DATA CONFIDENCE

Confidence Grade	Description
A Very Reliable	Data is complete and estimated to be accurate ± 2%.
B Reliable	Data is complete and estimated to be accurate ± 10%.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate ± 25%.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between ± 40%.
E Unknown	Little to no data is available at present.

Data	Confidence Assessment	Source
Operation Expenditure	A	Based on actual spending records. Consideration given to historical records.
Maintenance Expenditure	A	Based on actual spending records. Consideration given to historical records.
Projected Renewals	B	Taken from Asset Registry, Municipal Building Staff recommendations and industry standards.
Asset Useful Lives	B	Based on Municipal Building Staff recommendations and industry standards.

6.0 BUILDINGS

4.0 FUNDING SCENARIOS – HISTORIC VS. OPTIMAL

Building Financing	Scenario One - Optimal Funding										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE											
Optimal Annual Building Budget	1,560,847	192,071	195,764	199,458	203,152	168,094	171,096	174,098	177,098	180,100	183,102
Reserve Draw Down											
TOTAL REVENUE	**1,560,847**	**192,071**	**195,764**	**199,458**	**203,152**	**168,094**	**171,096**	**174,098**	**177,098**	**180,100**	**183,102**
OPERATION EXPENSE											
Operation Expense	128,416	128,416	130,886	133,355	135,825	138,294	140,764	143,233	145,703	148,172	150,642
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal	35,292	35,984	36,676	37,368	38,060	-	-	-	-	-	-
Replacement (Admin Office)	1,370,000										
Maintenance, Repairs & Rehabilitation	27,139	27,671	28,203	28,735	29,268	29,800	30,332	30,864	31,396	31,928	32,460
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution											
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											
Contributed Reserve											
TOTAL EXPENSE	**1,560,847**	**192,071**	**195,765**	**199,459**	**203,152**	**168,094**	**171,096**	**174,097**	**177,099**	**180,101**	**183,102**
NET INCOME (deficit)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

*** All figures shown in CAD $**
****Inflation assumption is 2 %**
***** Forecasted revenues & expenditures based on 2010 -2013 average spending**

6.0 BUILDINGS

Scenario Two – Historic Average Funding											
Building Financing	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
REVENUE											
Average Annual Building Budget	171,811	175,180	178,548	181,917	185,286	188,655	192,024	195,393	198,761	202,130	205,499
Reserve Draw Down											
TOTAL REVENUE	**171,811**	**175,180**	**178,548**	**181,917**	**185,286**	**188,655**	**192,024**	**195,393**	**198,761**	**202,130**	**205,499**
OPERATION EXPENSE											
Operation Expense	125,947	128,416	130,886	133,355	135,825	138,294	140,764	143,233	145,703	148,172	150,642
Debt Repayment - Development Charge											
CAPITAL EXPENSE											
Renewal (includes Admin. Office)	47,532	48,464	49,396	50,328	51,260	-	-	-	-	-	-
Replacement (Admin Office)	1,370,000										
Maintenance, Repairs & Rehabilitation	27,139	27,671	28,203	28,735	29,268	29,800	30,332	30,864	31,396	31,928	32,460
Non Infrastructure Solutions											
Disposal Activities											
Expansion Activities											
RESERVE BULIDING											
Asset Replacement Reserve Contribution											
Calculated Contribution											
Contribution Smoothing %											
Contribution Smoothing $											

6.0 BUILDINGS

Contributed Reserve											
TOTAL EXPENSE	**1,570,618**	**204,551**	**208,485**	**212,419**	**216,352**	**168,094**	**171,096**	**174,097**	**177,099**	**180,101**	**183,102**
NET INCOME (deficit)	**(1,398,807)**	**(29,372)**	**(29,936)**	**(30,501)**	**(31,066)**	**20,561**	**20,928**	**21,295**	**21,663**	**22,030**	**22,397**

*** All figures shown in CAD $ **Inflation assumption is 2 %**

***** Forecasted revenues & expenditures based on 2010 -2013 average spending**

5.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM

Asset Component	Useful Life	Life Remaining	2019 Renewals	2024 Renewals
Ferguson Fire Hall repairs	50	24%	$ 25,000.00	
McDougall Fire Hall repairs	50	46%	$ 30,000.00	
McDougall Rec. Centre repairs	60	95%	$15,000.00	
Nobel Beach House repairs	60	95%	$ 1,000.00	
Waubamik Hall repairs	50	74%	$ 25,000.00	
Administration Office repairs	50	-16%	$ 60,000.00	
Administration Storage Building repairs	30	-93%	$ 40,000.00	
Public Works Building repairs	50	94%	$ 15,000.00	
Sand/Salt Shed repairs	50	66%	$ 2,000.00	

Transfer Station Shed repairs	30	87%	$ 20,000.00	
		Total Program	***$ 173,000.00***	***$ 0.00***