



Municipality of McDougall

4.0 Roadway System

Asset Management Plan



December 2013

4.0 ROADWAY SYSTEM

Contents

STATE OF INFRASTRUCTURE	4
4.1 Inventory	4
Figure 4.1: Road System Inventory Summary.....	4
4.2 Valuation	5
Figure 4.2: Road System Historical & Replacement Value	5
4.3 Condition Assessment	5
Figure 4.3: Road System High Level Condition Assessment.....	6
4.4 Lifecycle Activities	7
Figure 4.4: Road System Lifecycle Activities	7
4.5 Life Expectancy	7
Figure 4.5: Road System Useful Life	8
Figure 4.6: Road System Remaining Useful Life	8
DESIRED LEVEL OF SERVICE	9
4.6 Target Levels of Service	9
Figure 4.7: Roadway Community Levels of Service 2012.....	10
Figure 4.8: Roadway Operational Levels of Service 2012.....	11
Figure 4.9: Bridge & Large Culvert Community Levels of Service 2012	13
Figure 4.10: Bridge & Large Culvert Operational Levels of Service 2012.....	14
ASSET MANAGEMENT STRATEGY	15
4.7 Non Infrastructure Solution – Asset Hierarchy	15
Figure 4.11: Critical Assets.....	15
4.8 Maintenance & Operations Plan	16
4.9 Renewal & Replacement Plan	17
Figure 4.12: Capital Planning Tool	17
4.10 Disposal Plan	17
4.11 Procurement Methods	17
4.12 Risks Involved with the Plan	18
Figure 4.13: Optimal vs. Budgeted Funding Strategies	18
What McDougall Cannot Do	18
Figure 4.14: Service Consequences & Mitigation	20

4.0 ROADWAY SYSTEM

FINANCING STRATEGY	20
4.13 Ten year Road System Expenditure Projections.....	20
Figure 4.15: Projected Operating & Capital Expenditure	21
Figure 4.16: Historic Road System Expenditures	21
4.14 Ten year Road System Funding Projections	22
Figure 4.17: Road System Funding Projections.....	22
Figure 4.18: Historic Road System Funding	23
4.15 Sustainability of Service Delivery.....	23
APPENDIX	24
1.0 CONDITION ASSESSMENT CRITERIA	24
2.0 LEVELS OF SERVICE CRITERIA.....	25
3.0 DATA CONFIDENCE.....	26
APPENDIX	
1.0 CONDITION ASSESSMENT CRITERIA.....	24
2.0 LEVELS OF SERVICE CRITERIA.....	25
3.0 DATA CONFIDENCE.....	26
4.0 FUNDING SCENARIOS – OPTIMAL VS. HISTORIC AVERAGE.....	27
5.0 PROJECTED 10 YEAR CAPITAL RENEWAL & REPLACEMENT PROGRAM.....	29

4.0 ROADWAY SYSTEM

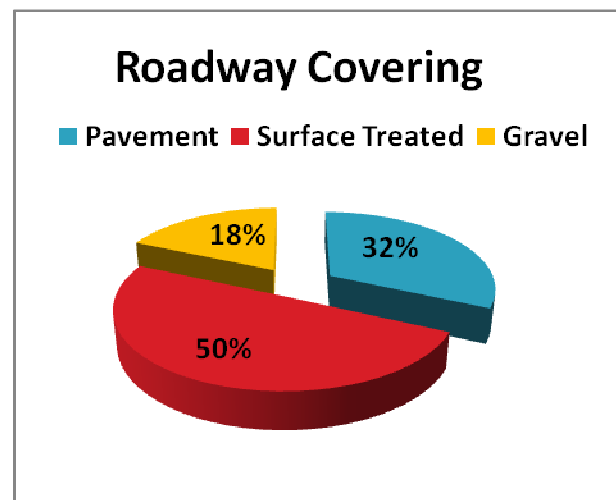
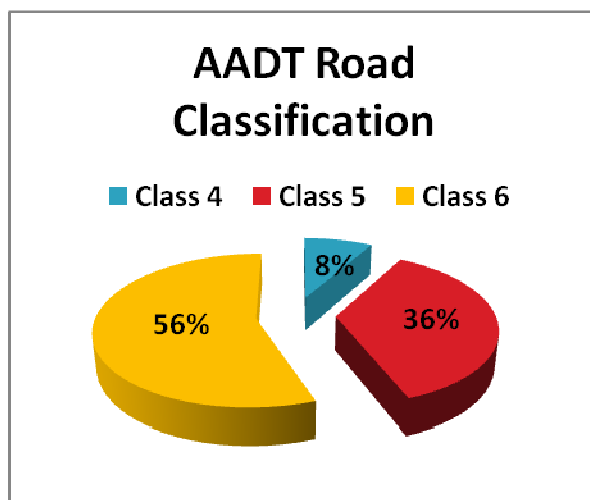
STATE OF INFRASTRUCTURE

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

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

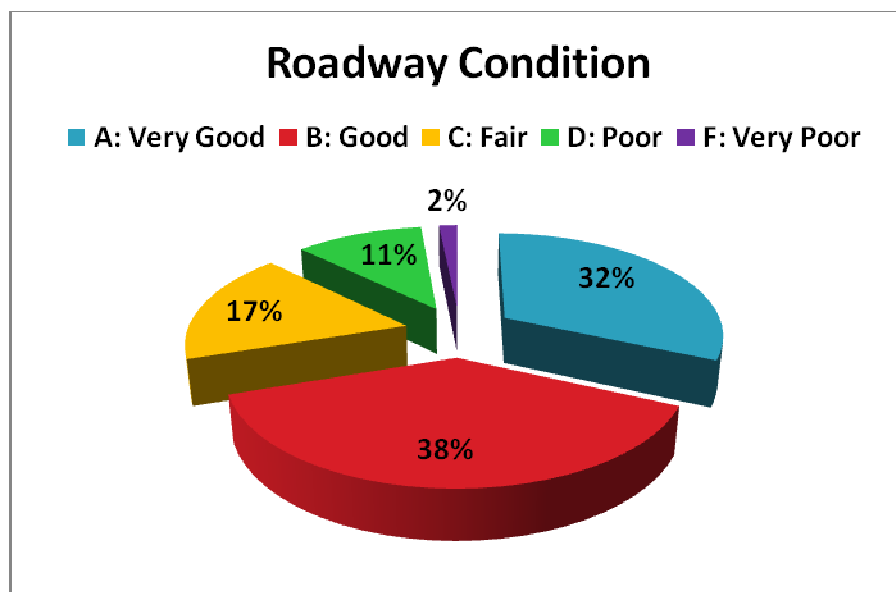
4.3 Condition Assessment

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

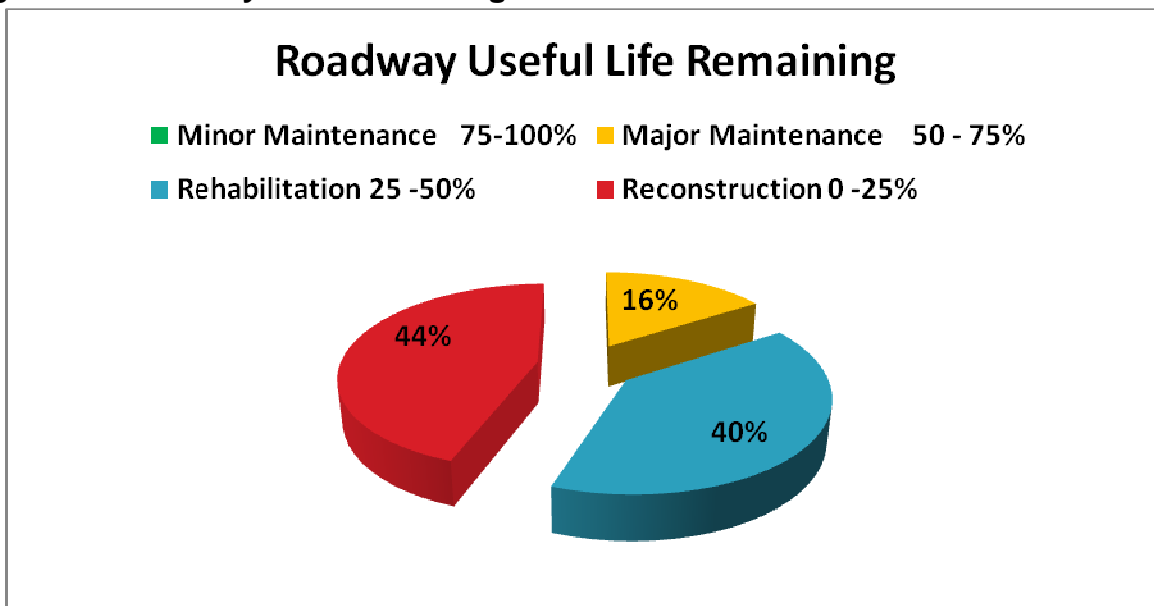
There are numerous direct and indirect variables that affect the useful lives of water assets such as climate, soil condition, and installation practices. With this in mind, the Municipality chose to rely on Municipal Staff in gauging useful life and life remaining for McDougall's road system. There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

4.0 ROADWAY SYSTEM

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 signage for hazards.	8 Customer complaints regarding signage.	5 Customer complaints regarding signage legibility, and orientation.
	Proper road drainage and ditching.	Number of road washouts.	2 partial road washouts.	0 road washouts.
		Streetlights are repaired in a timely manner.	All streetlights in 2012 were repaired within 30 days of notice.	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.	Customer complaints regarding congestion.	0 Customer complaints regarding congestion.	5 Customer complaints regarding congestion.
	Provide users with sufficient road capacity for their needs.	Customer complaints about road sharing with cyclists.	0 Customer complaints about road sharing with cyclists.	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.

4.0 ROADWAY SYSTEM

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.	Number of customer complaints regarding bridge maintenance.	0 customer complaints regarding bridge maintenance.	0 customer complaints regarding bridge maintenance.
	Provide routine maintenance work.	Maintenance schedule.	All maintenance in 2012 was carried out within timeframes specified in Bridge Report.	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.	<p>Bell Lake Bridge & Hurdville Culvert 2 have been replaced before the end of their lives in 2012.</p> <p>Average bridge/culvert useful life remaining in 2012: 71%</p>	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.

4.0 ROADWAY SYSTEM

4.12 Risks Involved with the Plan

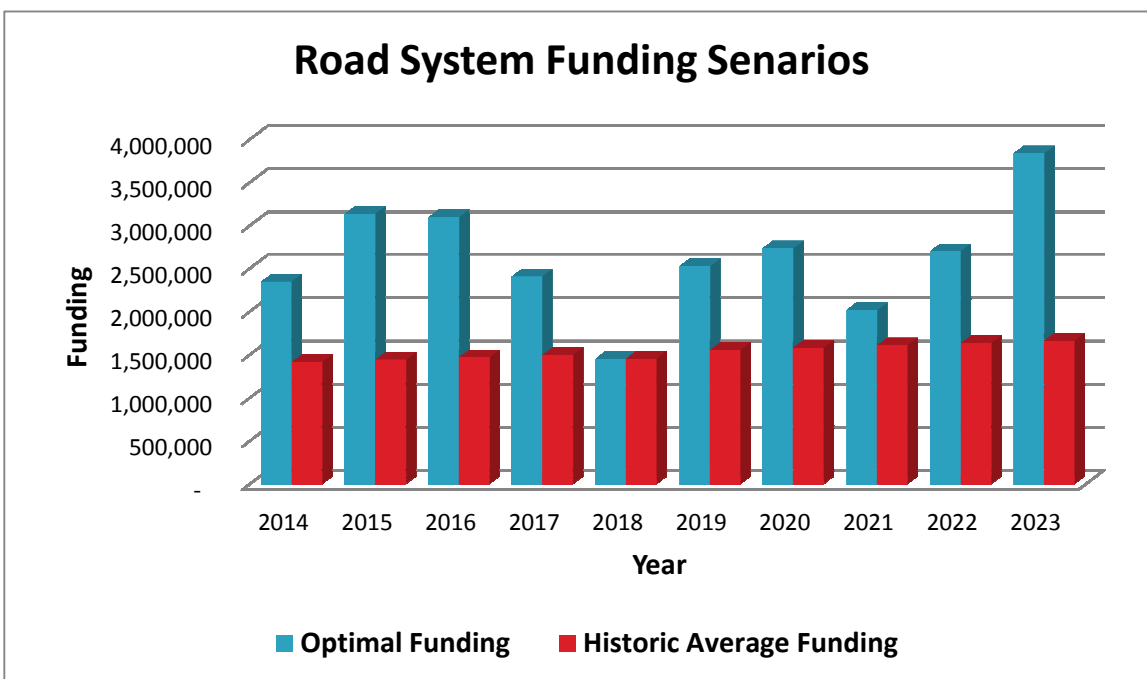
Optimal Capital Funding vs. Budgeted Capital Funding

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.

4.0 ROADWAY SYSTEM

Figure 4.14: Service Consequences & Mitigation

Action	Consequence	Mitigation Strategy
Critical assets will be maintained to higher standards than low risk assets.	<ul style="list-style-type: none">○ More minor repair work for Municipal Staff○ Stress on resources○ Reactive maintenance	<ul style="list-style-type: none">○ Regular inspections of lower demand roads and culverts
Roadways with higher traffic volumes and speeds will receive renewals before those with lower demand.	<ul style="list-style-type: none">○ Some roads with not receive renewal treatment before the end of their useful lives – poor road conditions○ Reactive maintenance○ More preventative repair work for Municipal Staff to extend the roadway life	<ul style="list-style-type: none">○ Routine preventative maintenance on lower demand roads○ Scheduled maintenance on lower demand roads
Minor culverts will only be replaced or repaired when they breakdown.	<ul style="list-style-type: none">○ Service interruption - roadway wash outs and flooding○ Reactive maintenance○ Stress on resources○ Municipality must keep replacement culverts on hand	<ul style="list-style-type: none">○ 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.

4.0 ROADWAY SYSTEM

Figure 4.15: Projected Operating & Capital Expenditure

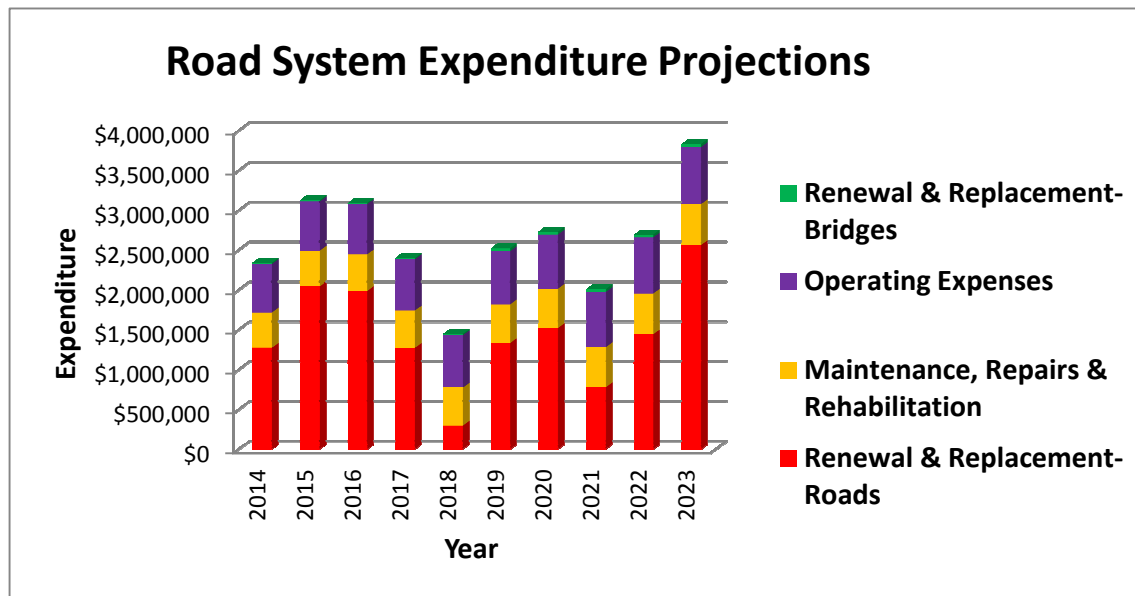
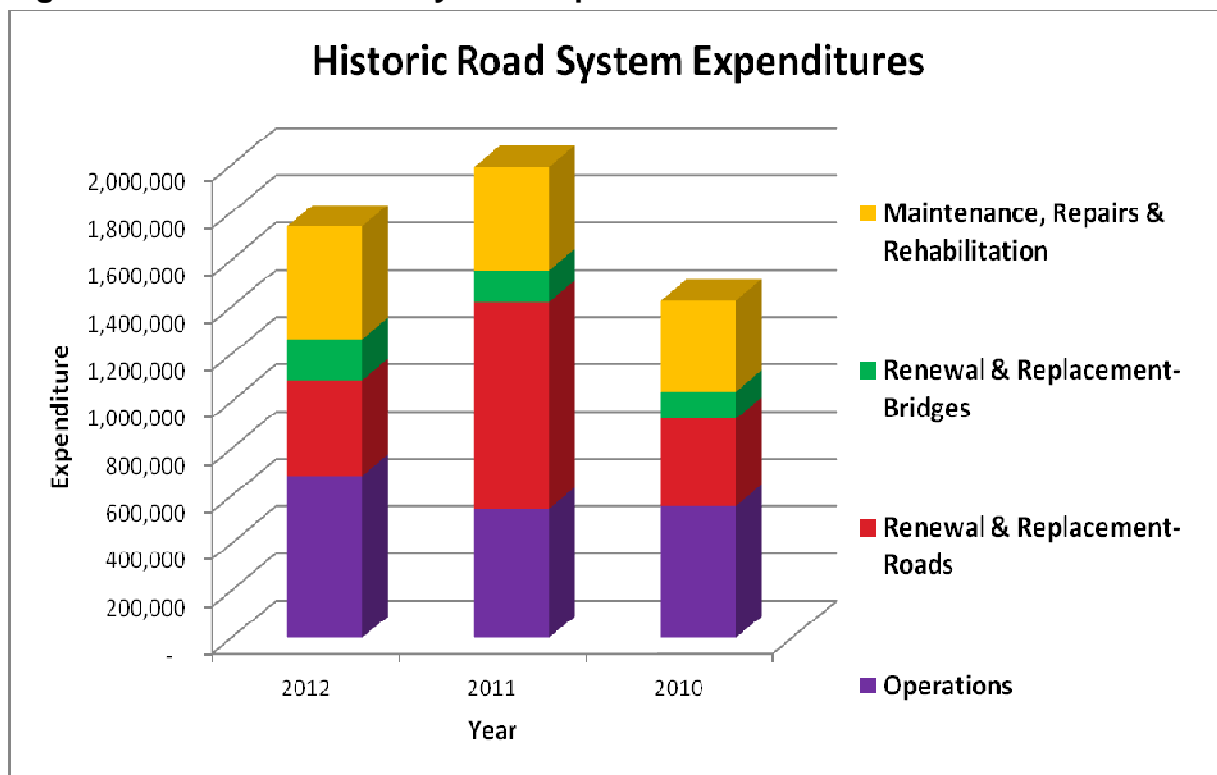


Figure 4.16: Historic Road System Expenditures



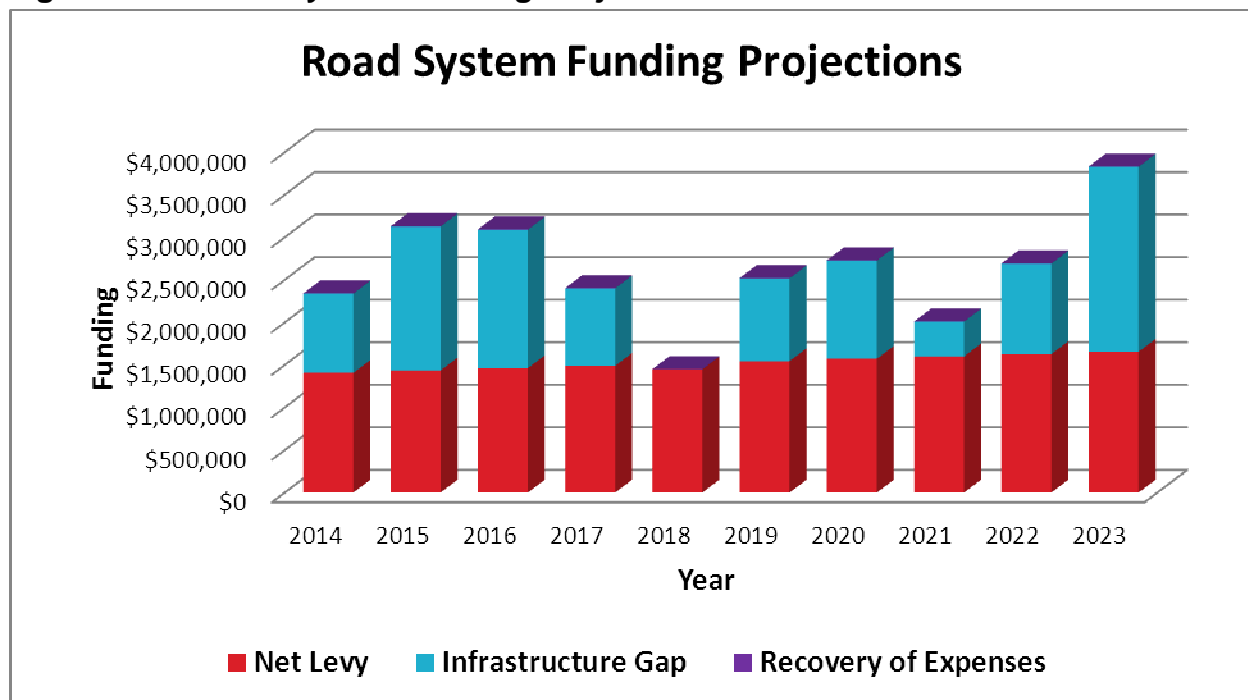
4.0 ROADWAY SYSTEM

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

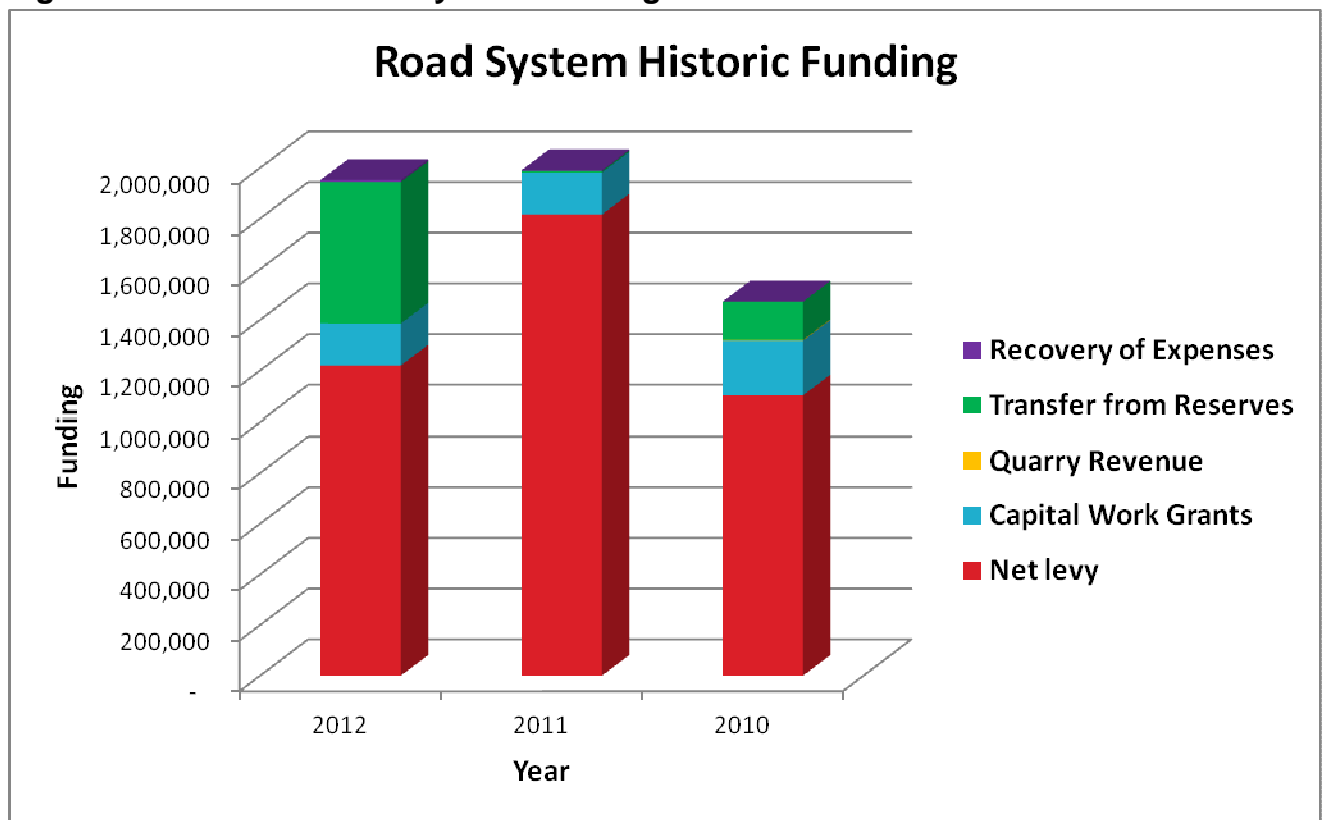
The optimal funding forecast for the next 10 years is shown in Figure 4.17 and was previously discussed in Section 4.12. Funding requirements cover all renewal, maintenance, operating and capital expenses. For comparative purposes Figure 4.18 shows road system funding from 2010 – 2012.

Figure 4.17: Road System Funding Projections



4.0 ROADWAY SYSTEM

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 to 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 <ul style="list-style-type: none">○ Slight surface deformation distresses○ No visible surface defects or cracking
OCI 70 - 80 B	Good: Pavement is in good condition w. smooth ride <ul style="list-style-type: none">○ Slight to moderate surface deformation distresses○ Slight to moderate intermittent surface defects and/or cracking
OCI 60 - 70 C	Fair: Pavement is in fair condition w. acceptable ride <ul style="list-style-type: none">○ Intermittent to frequent surface defects and/or cracking distresses○ 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 <ul style="list-style-type: none">○ Moderate to severe frequent surface defects and/or cracking distress○ 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 <ul style="list-style-type: none">○ Frequent to extensive bumps with frequent to extensive surface defects and/or cracking distresses○ 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 $\pm 2\%$.
B Reliable	Data is complete and estimated to be accurate $\pm 10\%$.
C Uncertain	Data is substantially complete but up to 50 % is extrapolated and estimated to be accurate $\pm 25\%$.
D Very Uncertain	Data is over 50% incomplete; most data is extrapolated or estimated. Accuracy is estimated between $\pm 40\%$.
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)

4.0 ROADWAY SYSTEM

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

4.0 ROADWAY SYSTEM

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