

ASSET MANAGEMENT PLAN - ROADS & STORM SEWER

for the
Township of Admaston / Bromley



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1.0 Executive Summary

The Township of Admaston / Bromley's core service infrastructure is aging and deteriorating, while at the same time there is demand for improvements to service. In order to develop management techniques to preserve and extend the service life of its infrastructure assets, while in turn providing a specific level of service, the Township commissioned the preparation of an Asset Management Plan.

This Asset Management Plan is intended to serve as a comprehensive reference guide for council, managers and staff, for when infrastructure asset investment decisions are made. It is a long-term financial planning document that allows municipal infrastructure financing decisions to be analyzed for their impact on future levels of service.

This document addresses the requirements of an Asset Management Plan as outlined in the provincial document, *Building Together: Guide for Municipal Asset Management Plan*. It addresses road and stormwater services, the only core services provided by the municipality.

Consultants and staff have reviewed current asset conditions, projected future conditions and the costs of long range infrastructure strategies. Current technical and financial practices have also been reviewed and have been consolidated into this Asset Management Plan.

The current road network has an overall condition index rating of 6.6 out of 10. A service level of ~7.0 is desired. Seven different asset management scenarios were analyzed, from "Do Nothing" to "Unlimited Funding". Projecting forward, it is evident that significant reconstruction and rehabilitation will be required over the next 10 years. The "Do Nothing" scenario (which has been close to the historical approach, with injections of Provincial funding when available), would leave the municipality with over 80% of its roads in a severely compromised state by 2024.

Given the current state of the core service infrastructure, an amortized capital investment in the order of \$1,800,000/year (present value) for the initial 10 year capital planning period would be required in order to deliver an ideal level of service and to maintain a safe road network system. This level of capital spending exceeds the Township's financial ability to deliver and maintain. Settling on a reduced desired service level has led to a more sustainable plan, with amortized capital investment spending of \$900,000/year (present value).

A copy of this plan, and any supporting documents, will be required to be submitted with any future (January 2014 onwards) provincial funding applications for infrastructure funding.

2.0 Introduction

The Township of Admaston / Bromley is a lower-tier municipality within the County of Renfrew. It is situated centrally within the County, with the Township of Whitewater Region and Horton Township to the east, the Township of Laurentian Valley to the north, the Townships of North Algona Wilberforce and Bonnechere Valley to the west, and the Township of Greater Madawaska to the south. The Bonnechere River roughly bisects the Municipality, and the Town of Renfrew is located immediately adjacent, to the south-west. Although considered a rural municipality, it has small areas of semi-urban population within the villages of Osceola and Douglas. According to the most current census information, it is home to approximately 2844 residents, living in approximately 1208 privately owned dwellings.

The Township of Admaston / Bromley recognizes that investment in infrastructure is vital, not only for economic growth, but also for maintaining both quality of life and safety for its residents. As such, this Plan is intended to complement the goals stated in other documents, including the Official Plan of the County of Renfrew. This would include:

- To maintain and enhance the quality of the natural, built and human environments
- To strengthen and diversify the economic base, within municipal servicing limitations.

This Plan is intended to be used during the municipal decision making process, so that council, staff and ratepayers can better understand the long term implications of their infrastructure decisions, both on service levels and financial sustainability. The plan is not intended to drive municipal decisions; rather it is intended to allow all participants to make informed decisions.

The purpose of this Asset Management Plan is to demonstrate how the Township can best manage their core infrastructure services, meeting their stated goals and service level targets in the most cost effective manner.

Responsibility for certain services is shared with the County of Renfrew: in particular social housing, bridges, and larger arterial roads. This Asset Management Plan will address only road and stormwater services. It is anticipated that, over time, the plan will be expanded to address all assets managed by the municipality, including buildings and recreational facilities. The goal of the this Asset Management Plan is to provide quality, cost effective services, meeting service standards in keeping with the needs of the community, while at the same time providing a long-term plan for the allocation of scarce resources to address the Township's aging and deteriorating infrastructure.

This plan will cover the 10 year period from 2014 to 2024. It is anticipated that over time, the Asset Management Plan will be updated to cover the entirety of the lifecycle of the assets.

The plan was developed by Jp2g Consultants Inc., in consultation with Municipal staff, Council, and ratepayers. To involve ratepayers, a questionnaire was distributed asking what they consider to be of most importance, and where there may be room for improvement. A total of 65 questionnaires were

received by the Township. Details and responses to the questionnaire are included in Appendix C of this report.

An Asset Management Plan is a living document that will need to be updated as conditions change. At a minimum, the Plan will undergo a major update every 5 years. In addition to major updates, the plan will be monitored on an annual basis, to ensure that data remain current (i.e. the addition of new assets) and that stated goals, such as service standards, are being met. The plan will also be reviewed following municipal elections, and incoming Council briefed on the Plan prior to making any financial decisions.

3.0 State of Local Infrastructure

This section summarizes the characteristics, value, and condition of the Township's core service assets. Determination of value, condition, and remaining useful life has been based upon standard engineering practice. While a full financial accounting valuation was completed under PSAB, based on historical costs and depreciation, replacement cost valuation is used throughout the following analysis. The purpose of this section is to use engineering evaluation practices to determine the status of local infrastructure by evaluating the condition of the roads in order to determine how much useful life remains in the asset and to schedule any necessary rehabilitation or renewal works.

3.1 Roads

In order to provide a solid basis for the Plan, a detailed Roads Appraisal Study was completed in 2013 (Appendix B). Condition ratings were determined for every municipally maintained road (where 10 would be a brand new road, and 0 would be an un-drivable roadway), together with lifecycle costing for each road over the 10 year planning period. Municipal records, engineering experience and judgment, and all available sources of information were used to provide realistic and detailed condition and cost assessments. The study incorporated standard road construction practices, costs, and deterioration rates, to arrive at the funding needs value.

The municipal road network consists of approximately 323 km of roads. of which 133 km are paved. Of the paved roads, 92 or 87 km are Low Class Bituminous – Double Surface Treated and 41 km High Class Bituminous, while gravel roads comprise 190 km of the road network. Approximately 53 km of County Roads and 47 km of Provincial Highways (132 and 60) are also located within the municipality.

Admaston / Bromley Township maintains 276 km of roadway on a year round basis; approximately 47 km of the road network is not maintained during the winter months. 17.4 kilometres of boundary road are also maintained by the Township through agreement with abutting municipalities. The Roads Appraisal Study encompassed only those roads maintained on a year round basis: 310 km of local rural roads, and 13 km of HCB semi-urban roads, within the two villages of Osceola and Douglas.

Using standard replacement valuation for the respective road types, and based on Jp2g Consultants Inc.'s engineering and contract administration experience in the area, it is estimated that total present

value replacement costs (2013) are in the order of \$132,000,000. Detailed calculations supporting this replacement valuation are provided in Appendix B.

Where possible, based on discussion with staff, dates of most recent road work are recorded in the Roads Appraisal Study. It is a challenge to assess the age of much of the road network, given the lack of readily available records and the long history of settlement in the area. It is likely that many roads have been in existence for decades.

The majority of surface treated roads in the Township of Admaston / Bromley are over 20 years old and in need of immediate attention. Much of the system is functioning beyond its expected useful life. Only a minority of surface treated roads are in good condition, and within their expected useful life. Much of the road network has been subject to multiple resurfacing, while the road base has deteriorated and requires reconstruction. Over the 10 year planning period, it is expected that approximately 50% of the length of the system will require capital works, for the purpose of rehabilitation or reconstruction.

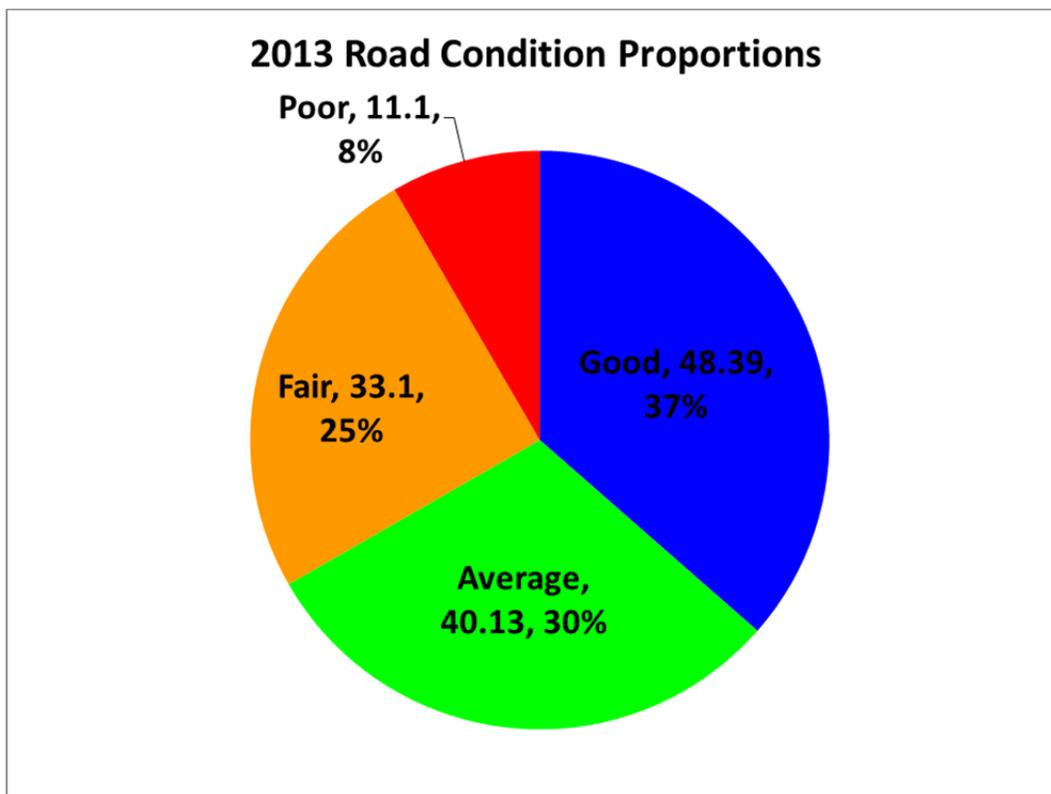


Figure 1 2013 Road Condition Proportions

As indicated in the above pie chart, a significant proportion of municipal road assets are categorized as “Fair” (condition: 4 - 5 out of 10) and “Poor” (condition less than 4 out of 10). These roads require capital works in the near term in order to bring them up to standard before they are considered to be failing and require total reconstruction.

A detailed road inventory is included in the Roads Appraisal Study, prepared in accordance with MTO Guide "Roads Management Plan for Small Lower Tier Municipalities - Methods and Inventory Manual - MTO MAY 1987" (Appendix A).

3.2 Bridges

Bridges are defined as any crossing that spans a distance greater than 3.0 metres. The County of Renfrew is responsible for all crossings within the County of Renfrew having a span greater than 3.0 metres. Admaston / Bromley Township therefore has no bridge assets.

3.3 Water

The Township of Admaston / Bromley does not have a municipal water supply.

3.4 Sewage

The Township of Admaston / Bromley does not have any municipal sanitary sewers or wastewater treatment plants.

3.5 Stormwater

The Township of Admaston / Bromley owns limited stormwater management infrastructure within the semi-urban villages of Osceola and Douglas. Inventories and replacement valuation of these items are addressed within the Roads Appraisal Study (Appendix B).

3.6 Social Housing

The Township of Admaston / Bromley has no Social Housing assets: social housing services are the responsibility of the County of Renfrew, through the Renfrew County Housing Corporation. The County of Renfrew is responsible for the coordination of access to social housing.

3.7 Updating the *State of Local Infrastructure*

Condition updates related to capital upgrades will be recorded in a log book and incorporated into the plan on a yearly basis. Minor updates or revisions to characteristics (i.e. length, location, width, traffic volumes) of assets will also occur on an annual basis. It may be necessary to modify either planned goals or planned actions, if the Plan is found to be not performing as expected. This too, will be evaluated on an annual basis.

The Asset Management Plan as a whole will be updated every 4 years, upon election of a new council. Such an update will require a new Road Appraisal Study and an update to standard costs, capital needs etc. If desired, additional core service assets might be added at that time. Road condition ratings will continue to be based upon the *Road Management Plan for Small Lower Tier Municipalities, Methods and Inventory Manual MTO 1987*. As sequential Road Studies are undertaken and the information is

accumulated into the road condition database, it is anticipated that the accuracy of degradation predictions will improve.

4.0 Desired Level of Service

A recommended method for expressing desired Level of Service has been developed for roads and municipal stormwater services, in keeping with the requirements of the Ministry of Infrastructure.

4.1 Roads

Condition Ratings

In the preparation of a Road Appraisal Study a condition rating from 1 to 10 is assigned to each road section. This number is a visual assessment of existing surface and structural condition of the street, with 10 being the best case. Future condition ratings are calculated for each road and from this, predicted maintenance and capital expenditures produced.

It will take, on average between 10 and 30 years for any given surface treated or paved road to decrease from a condition rating of 10 to 5. Asphalt roads need to be resurfaced within 15 to 20 years and if not resurfaced, then partially reconstructed in 30 years. Surface treated roads can be resurfaced (capping layer) in the 3rd or 4th year after initial paving to reduce the chance of water entering the road base. Once completed, routine maintenance and pot hole patching can be undertaken until the road is ready for a total resurfacing (approximately 10 years).

(Note that a road surface, whether treated or paved, cannot be perpetually resurfaced, at some point the road must be reconstructed.)

Paved road sections with a forecasted condition rating of 5 are in need of improvement. Roads should not be allowed to go below 3 due to the severity of the road conditions, e.g. very poor ride, difficult to maintain, usually a safety hazard.

Gravel road condition ratings ranging between 5 and 10 will generally not change due to continued routine maintenance and gravelling of the granular top surface.

Rating Definitions

8 to 10 out of 10

Overall Road System

- Good structural condition
- Some local improvements may be needed

Pavement Section

- Good structural condition.
- Some local improvements may be needed
- Curb and Gutter (if present) are in good condition
- Riding quality is excellent
- Rehabilitation/Resurface in about 15 years (high traffic volumes) 20 to 25 years (low traffic volumes)

Surface Treatment Section

- Little or no evidence of cracking or distortion
- Ditching and drainage are adequate

- Riding quality excellent to good
- Rehabilitation – single surface treatment required in 3 to 4 years

5 to 7 out of 10

Overall Road System

- An average value of 7.5 out of 10 for the road system has been determined to be the municipal target.
- Average structural condition
- Some continued improvement may be needed

Pavement Section

- Pavement structure condition is good
- Some evidence of cracking or distortion usually at catch basins or manholes
- Curb and Gutter (if present) are in good condition
- Riding quality is good
- Rehabilitation/Resurface in about 7 to 10 years on (high traffic volumes) 12 to 15 years (Low traffic volume)

Surface Treatment Section

- Surface Treatment is good although there may be some loss of aggregate
- Some evidence of localized cracking and minor distortion
- Ditching and drainage appears adequate throughout the length of the road section
- Riding quality is good to fair
- Single surface treatment required in 2 to 4 years

4 to 5 out of 10

Overall Road System

- Poor structural condition
- Substantial improvement needed throughout total road system

Pavement Section

- Extensive cracking at various locations (transverse, longitudinal, alligating, etc.)
- Severe Surface distortion evident
- Surface may have been patched (hot or cold mix)
- Curb and Gutter may be spalled, broken or distorted
- Riding quality fair to poor
- **Rehabilitation/Resurface**- Now or schedule within the next 3 years

Surface Treatment Section

- Extensive areas of cracking and distortion
- Localized areas of breakup-usually in wheel paths or along edge of roadway
- Localized base distortion may be severe in many areas

- Aggregate loss may be extensive
- Ditches may be silted or grassed and holding water
- Riding quality is fair to poor
- **Rehabilitation** – Single or double surface treatment now or within the next 1 or 2 years, including padding and shouldering

3 out of 10

Overall Road System

- Road system should not reach this value as an average condition

Pavement Section

- Poor ride
- Difficult to maintain (more cold patch than road)
- Potential safety hazards exist
- **Reconstruction** may be required

Surface Treatment Section

- Extensive cracking and distortion over most or entire length or road section
- Extensive areas of breakup over the length of road section
- Evidence of water ponding in the wheel paths
- Ditches silted or grassed and holding water
- Riding quality is poor
- Reconstruction including scarification and reshaping, some base excavation, gravel lift over entire length and double surface treatment

Performance Measure - Average Weighted Road Condition Index

It was decided, based on discussion with Township staff, that an average weighted road condition be the primary metric for determining the overall roads service standard within the municipality. A weighted index for each roadway is created by multiplying the Length, Traffic, and Condition to obtain an index value. The index will be highest for roads that have higher traffic values, are longer, or are in better condition. Longer roads are more likely to be collector and arterial roads and are of greater importance to the road system compared with local roads or dead end roads. The effect of this methodology is to balance the impact of the deterioration of shorter length, low-traffic volume roads against higher traffic collector or arterial roads. A road condition rating for each road within the municipality was determined, based on the 2013 Road Appraisal Study. Ratings were then projected forward for each year of the planning period, based on expected deterioration rates.

This performance metric is then used to set an overall roads service standard within the municipality. An example calculation of the metric is replicated below:

Road	Length	Traffic	Condition	Σ (Traffic * Length)	Σ (Traffic * Length * Condition)
R001	5.9	700	6	4130	24780
R002	1.5	300	8	450	3600
R003	2.0	125	9	250	2250
R004	0.2	25	4	5	20
			Total	4835	30650
Σ (Traffic * Length * Condition)/ Σ (Traffic * Length)					=30650/4835
Σ (Traffic * Length * Condition)/ Σ (Traffic * Length)					6.34
Average Weighted Road Condition Index					6.34

Table 1: Calculation of Overall Roads Condition Rating

An average road system condition rating of between **7.0 and 7.5 out of 10** was determined to be an appropriate service level goal, based on discussion with municipal staff, and review of the *Road Management Plan for Small Lower Tier Municipalities, Methods and Inventory Manual, MTO 1987*. The current road system performance is measured to be **6.63 out of 10**, which is below the target value. Significant Capital Investment would be required to reach and maintain the stated service level target.

Based upon capital expenditures recommended in the 2013 Roads Appraisal Study, and given the performance expected over the plan period, an average system condition rating of **7.67 out of 10** could be achieved, given sufficient Capital Investment. This would represent an improvement in the overall system condition.

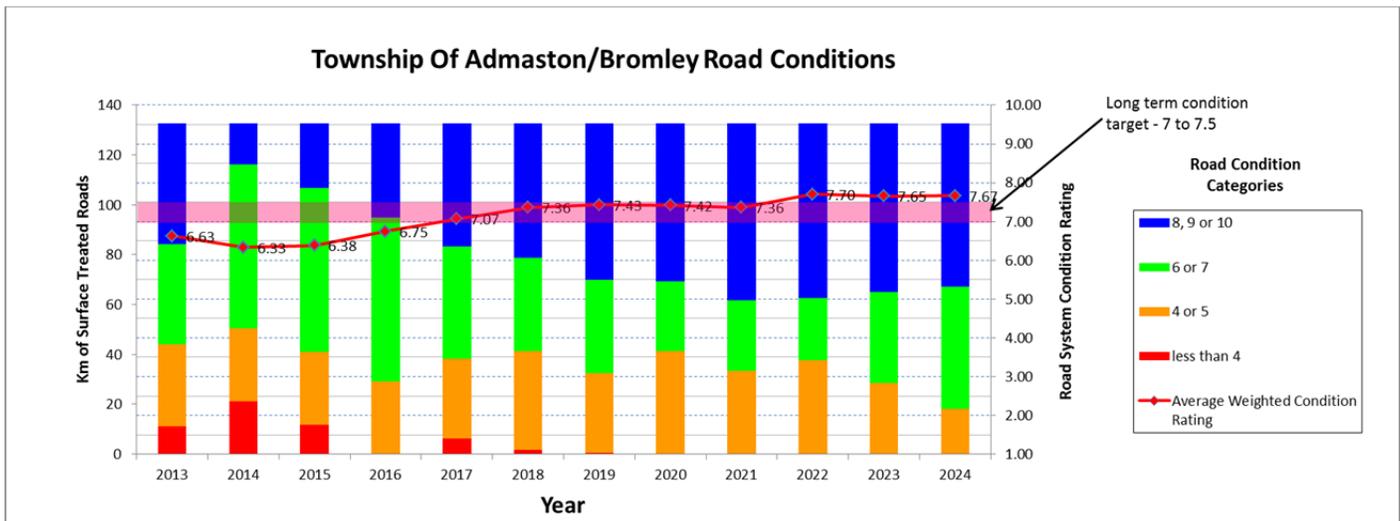


Figure 2: Projected Road System Condition Rating: Roads Appraisal Study - Scenario 6

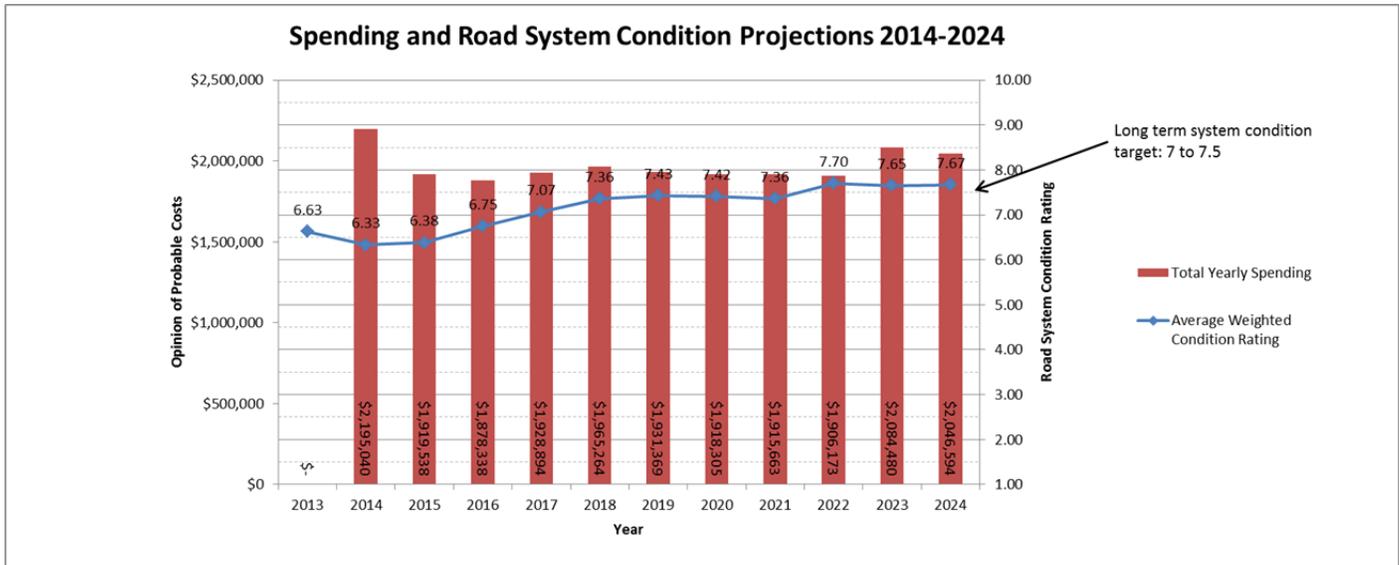


Figure 3: Projected Future Capital Spending: Roads Appraisal Study - Scenario 6

Under this scenario (one of several possible scenarios) amortized capital spending for the 10 year period would be in the order of \$1.8 million/yr (present value). The overall system condition rating would exceed 7.0 in 2017, would peak at 7.7 in 2022, and decrease to 7.67 in the 2024 period. The 10 year average system condition rating is 7.19, which is consistent with the stated Municipal goal of maintaining a rating between 7 and 7.5.

External Trends

External trends, beyond the control of the municipality, could adversely affect the ability of the municipality to deliver the stated service target level. Such trends might include an increase in significant weather events, rising commodity prices (aggregates, oil, steel), or other economic impacts. Generally speaking, the dryer the weather, the better the road base will perform. Commodity prices are anticipated to form a significant driver for how much capital works are performed, as a significant proportion of the cost of any project is devoted to petroleum resources, either in the form of fuel (trucking, hauling) , or the surface course road binder materials (asphalt). Larger economic trends can affect the viability of projects as well, particularly if debt financed.

Questionnaire

A questionnaire was sent out to all residents within the Township of Admaston / Bromley, to provide the municipality with public input on perceived and desired levels of service. The results from this survey can be summarized as follows:

Overall Road Condition Assessment		
	Response Percent	Response Count
Very Satisfied	10.8%	7
Satisfied	47.7%	31
Neutral	20.0%	13
Dissatisfied	16.9%	11
Very Dissatisfied	4.6%	3
Total Responses	100%	65

A sample questionnaire and the tallied results are presented in Appendix C.

4.2 Stormwater

Effective stormwater management is a vital aspect of road maintenance, and will contribute to the prolongation of the life of the road. Water must be kept off, out of, and away from the road.

For rural roads the stormwater management system is comprised of ditches and culverts to convey water away from the road. In the Semi-Urban areas of the municipality catchbasin structures and underground pipes are used to convey surface water to a good and sufficient outlet.

The desired level of service for stormwater is the safe and effective functioning of road.

5.0 Asset Management Strategy

The Asset Management Strategies presented here address Road and Stormwater Assets only.

5.1 Non-Infrastructure Solutions

Non-infrastructure solutions are actions or policies that can lower costs or extend asset life.

The municipality can obtain improved efficiencies through integrated infrastructure and land use planning. This strategy relies upon the coordination of municipal capital activities with other stakeholders to ensure that capital activity is not duplicated. Activities should be scheduled in an efficient and compact manner to obtain the maximum economies of scale. If a short 100m section of roadway is intended to be rehabilitated, and it is adjacent to a longer roadway, rehabilitation of both at the same time should be considered. Savings will result from a reduction in mobilization and small volume premium costs. Every capital expenditure has a mobilization cost, and dispatching resources to attend to a multitude of smaller capital works is not an efficient use of those resources. Small capital projects cannot take advantage of economies of scale, which results in increased costs and decreased value delivered.

There may also be the possibility of obtaining economies of scale related to the coordination of capital works activities with neighboring municipalities and/or the County of Renfrew.

The municipality should encourage higher density development along existing roads.

5.2 Maintenance

Maintenance activities include regularly scheduled inspections, maintenance, or more significant repair and activities associated with unexpected events. Maintenance activities for the Townships roads are undertaken by in house staff, using the Township's own equipment. This includes all routine maintenance for roads such as: pothole patching, shoulder grading, sign maintenance, winter maintenance, surface grading, replacement of small diameter culverts on unpaved roads and hand brushing.

5.2.1 Gravelling

Gravelling is the upgrading of the surface course of existing gravel roads. These roads degrade over time, through the typical action of traffic, rain, snow, and snowplowing. Gravel is slowly removed from the road surface resulting in wash-boarding, potholes, road breakup/softening, washouts or other issues that significantly detract from the surface, riding quality, and safety of the roadway. Gravel roadways require ongoing maintenance to restore the correct crossfall of the roadway and also to ensure that water does not pool on the road surface.

Current municipal practice is to add 75mm of granulars to all gravel roads on a 7 year cycle. With 190 km of gravel roads, this corresponds to approximately 27 km per year.

Current municipal spending is approximately \$100,000 per year for granulars. It should be noted that the Municipality is currently obtaining gravel at below market price. The cost of implementing the 7 year cycle program at current market price is estimated to be closer to \$230,000/year (present value). It should also be noted that the twinning of Highway 17 through to the Town of Renfrew in coming years will have a significant impact on gravel pricing.

5.2.2 Shouldering

Shoulders are important components of road infrastructure, protecting the edge of the road surface and supporting surface water drainage. Shoulders require ongoing maintenance (grading) to prevent the loss of lateral support, to prevent the deterioration or failure of the road edge, to eliminate distortions such as wash boarding, ruts and potholes, and to maintain roadside drainage patterns.

Shoulders should be inspected regularly and, ideally, graded once in any five year period for hardtop surfaces. Granular surface shoulders would ideally be addressed during the yearly grading program.

The creation of a regular scheduled shouldering program will be explored over the next year.

5.2.4 Ditching

Ditches are constructed to convey water from storm runoff to an adequate outlet. For rural and some semi-urban areas ditches are the sole method of conveying water and maintaining dry road granulars. Ditches have a tendency to fill-in over time, primarily due to natural erosion and vegetation. Periodic maintenance is required in order to remove this accumulation and reinstate the designed ditch line. A properly designed and maintained ditch will continue to drain surface water away from the road surface and add to the life of the road. Ditching should occur with a frequency of once per every five years.

The creation of a regular scheduled maintenance program for the ditch system will be explored over the next year.

Ditching has also been included as a line item in all reconstruction or rehabilitation activity (See Roads Appraisal Study, Appendix B).

5.2.5 Culverts

Preventative culvert maintenance will extend the life of the structure and ensure that it functions as designed. Culvert maintenance includes the removal of accumulated debris (e.g., logs, boulders, garbage, ice build-up) that prevents the efficient passage of water through the structure. Culvert maintenance may also include the reinforcement of eroding inlets and outlets. Culverts requiring continual regular maintenance should be considered for future reinstallation for the purpose of addressing the problem.

Culvert installation costs have been included as a line item in all reconstruction or rehabilitation activity (See Roads Appraisal Study, Appendix B).

5.2.5 Crack Sealing

Adopting a pavement preservation program would extend the life of municipal roads and help keep them in good condition. Crack sealing is recognized as an effective preventative maintenance activity that can extend the life of existing roads. It entails the mechanical removal (routing) of the crack and re-sealing of the surface. The effect is to prevent water from entering the road base and accelerating the deterioration of the road. The overall impact to the road is an approximate increase in lifespan of up to 5 years. It is recommended that crack sealing be implemented by the municipality on selected roads to ensure that they obtain the maximum life from the road surface. If crack sealing cannot be implemented for a given road, it is likely that said road will experience an accelerated deterioration rate.

Crack sealing can only be implemented when single linear or short spider cracks are evident in the road surface. When the road has begun alligator cracking, crack sealing is no longer an effective strategy. For this reason is recommended that roads having condition ratings between 7 and 8 be reviewed for their suitability to apply crack sealing. It is anticipated that implementing a crack sealing program will be discussed with the municipality in the coming years.

5.2.5 Other

This category refers to unscheduled or emergency maintenance items (i.e. road washouts, storm damage) that are not contemplated as part of scheduled maintenance works. Local staff and officials are likely to be the first responders to address these emergencies. These unscheduled items may result in an immediate decrease in service levels, and possibly health and safety consequences to service users. These items should be addressed as soon as possible.

Costs for these items, while unplanned, can be managed using short term loans, emergency transfer from other budgeted items put on hold, or financing from reserves.

5.3 Renewal/Rehabilitation/Replacement (Reconstruction)

Renewal/Rehabilitation activities are significant repairs that are designed to extend the life of an asset. For road assets these activities can be summarized into resurfacings, and partial depth reconstructions. Replacement (Reconstruction) activities are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option. In this situation, full depth reconstruction is an appropriate option to address the road.

If the Roads Appraisal Study were to be followed, an average service standard of 7.19 would be achieved, but only with considerable capital spending.

This scenario, along with six (6) others, were analyzed, and reviewed by township staff and Council. The six scenarios were as follows:

1. Do-Nothing.
2. Defer maintenance for Rural AADT<400, then convert to Gravel at end of life. Only Rehabilitate Priority Roads.
3. Only Rehabilitate Surfaces.
4. Defer maintenance for Rural AADT<200, convert to Gravel at end of life. Only rehabilitate other roads.
5. Rehabilitate Roadways.
6. Based on Roads Appraisal Study, cost to maintain 2013 surface types.
7. Unlimited Funding Scenario.

The results can be summarized as follows:

Scenario No.	Scenario Description	Current (2013) Road Condition	End of Period (2024) Road Condition	Road Condition Target	Cost (\$/year)
1	Do-Nothing	6.63	3.35	7.0-7.5	\$ -
2	Defer maintenance for Rural AADT<400, then convert to Gravel at end of life. Only Rehabilitate Priority Roads.	6.63	5.65	7.0-7.5	\$ 599,194
3	Only Rehabilitate Surfaces.	6.63	6.43	7.0-7.5	\$ 669,739
4	Defer maintenance for Rural AADT<200, convert to Gravel at end of life. Only rehabilitate other roads.	6.63	6.90	7.0-7.5	\$ 898,028
5	Rehabilitate Roadways.	6.63	6.92	7.0-7.5	\$ 1,046,070
6	Based on Roads Appraisal Study	6.63	7.67	7.0-7.5	\$ 1,804,836
7	Unlimited Funding Scenario	6.63	8.96	7.0-7.5	\$ 5,220,857
1. Cost is expressed in 2013 dollars, future years' budgets to be inflation adjusted.					
2. Minor changes to these presented values are anticipated as the Asset Management Plan is finalized.					

Detailed information on all 7 scenarios can be found in Appendix D

The do nothing approach will address neither public health and safety concerns, nor the Township’s deteriorating infrastructure. Reconstruction to full standards would be far too costly. Therefore, based on discussion with council it was decided that, given financial constraints, Scenario 4 (defer maintenance for Rural AADT<200, convert to gravel at end of life and only rehabilitate other roads) was appropriate for the purpose of maintaining health and safety and delivering a fairly reasonable level of service.

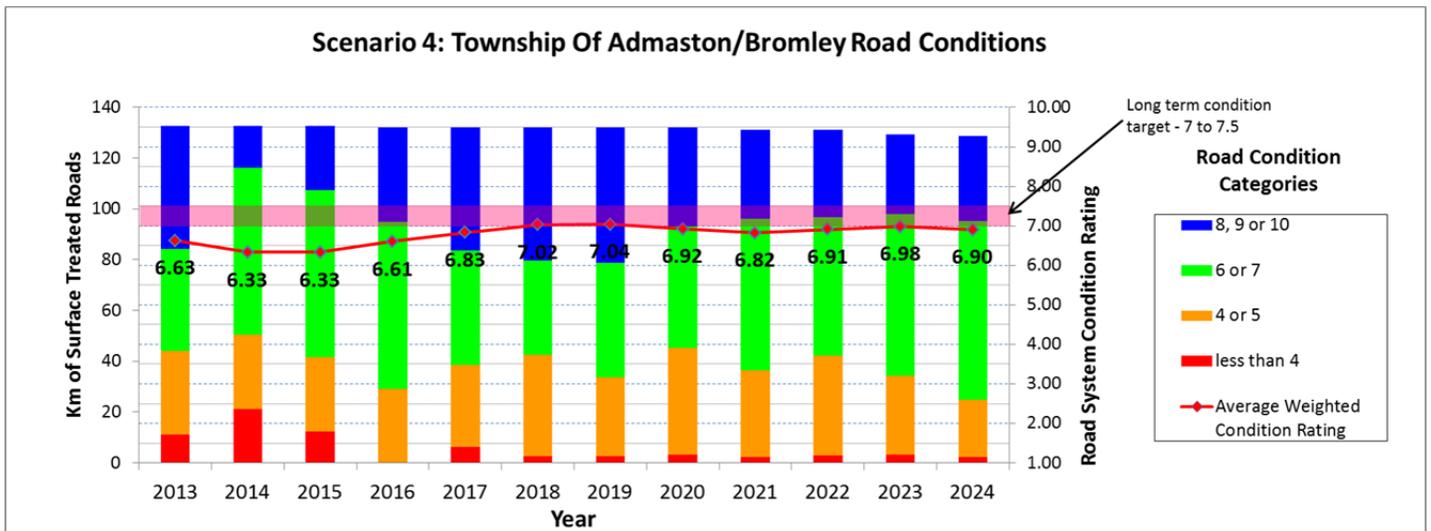


Figure 4: Projected Road System Condition Rating: Scenario 4

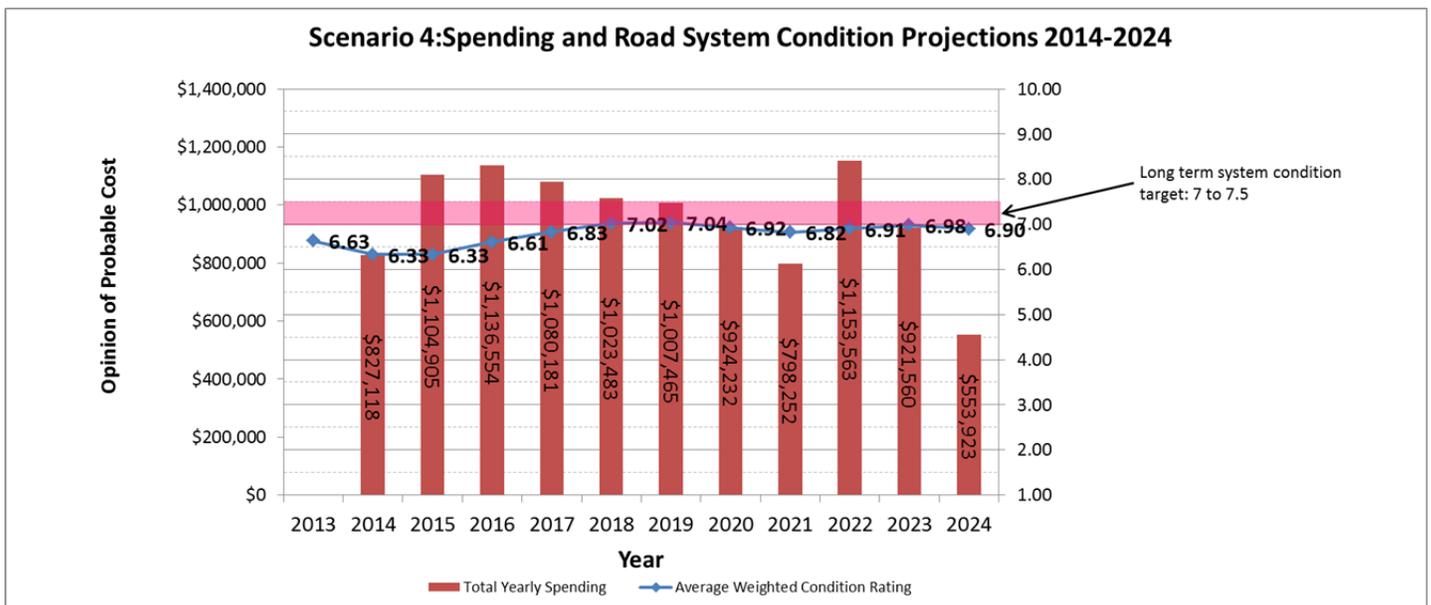


Figure 5: Projected Future Capital Spending: Scenario 4

Under this scenario amortized spending for the 10 year period would be on the order of \$903,000/yr (present value). The overall system condition rating would exceed 7 in 2019, and decrease to 6.9 in the

2024 period. The 10 year average system condition rating is 6.79, which is consistent with the stated Municipal goal of maintaining a rating between 7 and 7.5.

This scenario is based on the following schedule of Capital works:

2014								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
EME01A	EMELIN ST.	0.1	HCB	3	Resurface 0.3km Rural HCB	SEMI-URBAN	\$ 14,400	25
FIT01	FITZPATRICK ST.	0.6	LCB	3	2013 Reconstruct as Rural - Pulverize Existing and Gravel	SEMI-URBAN	\$ 54,000	25
EME01B	EMELIN ST.	0.2	LCB	3	Resurface 0.3km Rural HCB	SEMI-URBAN	\$ 18,000	25
KEN01	KENNELLY RD	1.6	LCB	3	Resurface 1.4km Reconstruct 0.2km at RailRoad Crossing	RURAL	\$ 144,000	300
PIN02	PINE VALLEY RD.	2.5	LCB	3	Resurface 2.5km Rural LCB	RURAL	\$ 225,000	300
MCP02	MCPEAK LINE	1.8	LCB	3	Resurface 1.8 Rural LCB Road	RURAL	\$ 162,000	300
EGA02	EGAN LINE	1.8	LCB	3	Resurface 1.8 km LCB	RURAL	\$ 162,000	300
HAR01	HARVEYS CRESCENT	0.7	HCB ON CONCRETE	3	Gravelled	RURAL	\$ 60,000	125
2015								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
EGA03	EGAN LINE	1.8	LCB	3	1.8km resurface LCB	RURAL	\$ 162,000	300
EGA01	EGAN LINE	1.9	LCB	4	Resurface 1.9 km Rural LCB	RURAL	\$ 171,000	300
KEN02	KENNELLY RD	1.9	LCB	4	Resurface 1.9km	RURAL	\$ 171,000	300
MCG01	MCGAGHRAN RD.	2.5	LCB	4	Resurface 2.5km Rural LCB	RURAL	\$ 225,000	300
PUC03	PUCKER ST.	3.7	LCB	4	Resurface: Scarify + 150A + PDST 3.7km	RURAL	\$ 333,000	700
2016								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
OPG01	OPEONGO RD	2.36	LCB	5	Resurface LCB	RURAL	\$ 212,400	1000
CAM03	CAMPBELL LINE	2.64	LCB	5	Pulverize and Pave + 150A 2.6km	RURAL	\$ 237,600	300
FOY05	FOY RD	1.8	LCB	5	Pulverize and Pave 1.8km	RURAL	\$ 162,000	300
LYN01	LYNCH RD	1.8	LCB	5	Resurface PDST 1.8km	RURAL	\$ 162,000	300
DIL03	DILLABOUGH RD.	1.3	LCB	5	Resurface 1.3 km Rural LCB	RURAL	\$ 117,000	300
PIN01B	PINE VALLEY RD.	0.7	LCB	5	Resurface 0.7km Rural LCB	RURAL	\$ 63,000	300
DIL02	DILLABOUGH RD.	1.3	LCB	5	Resurface 1.3km Rural LCB	RURAL	\$ 117,000	300
2017								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
RIC03A	RICE LINE	1.5	HCB	5	Resurface 1.5km of Rural LCB (includes 300m around corner)	RURAL	\$ 216,000	300
RIC04	RICE LINE	1.7	LCB	5	Resurface 1.7km Rural LCB	RURAL	\$ 153,000	300
PUC02	PUCKER ST.	0.6	LCB	5	Scarify +150A + PDST 0.6km	RURAL	\$ 54,000	700
SNA01	SNAKE RIVER LINE	1.8	HCB	5	Resurface	RURAL	\$ 259,200	700
PUC04	PUCKER ST.	3.06	LCB	5	Resurface PDST 3.06 km	RURAL	\$ 275,400	700
KIN01	KING ST.	0.1	HCB	6	Resurfacing 0.1 km Rural HCB	SEMI-URBAN	\$ 14,400	25
HIL01	HILL ST.	0.08	HCB	6	80m semi-urban resurfacing	SEMI-URBAN	\$ 11,520	25
GRO02	GROVES ST.	0.1	HCB	6	Resurface 0.1km Semi-urban HCB	SEMI-URBAN	\$ 14,400	25
2018								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
CHE02	CHEESE FACTORY RD	0.6	LCB	6	Resurface 0.6km PDST	RURAL	\$ 54,000	700
BAR01A	BARR LINE	1.8	HCB	6	Resurface Rural HCB	RURAL	\$ 259,200	700
BAR01	BARR LINE	0.7	HCB	6	Resurface Rural HCB	RURAL	\$ 100,800	700
MOU03	MOUNT ST. PATRICK RD	4.2	LCB	7	Resurface 4.2km PDST	RURAL	\$ 378,000	300
CUL01	CULHANE RD	1.5	LCB	7	Pulverize and Pave 1.5km	RURAL	\$ 135,000	300
2019								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
FOY04	FOY RD	1	LCB	5	Gravelled	RURAL	\$ 45,000	125
DIL04	DILLABOUGH RD.	1.3	LCB	6	Resurface 1.3km Rural LCB	RURAL	\$ 117,000	300
GRO01	GROVES ST.	0.1	HCB	7	Resurface 0.1km semi-urban	SEMI-URBAN	\$ 14,400	25
KIN02	KING ST.	0.1	HCB	7	Resurface 0.1 km semi-urban HCB	SEMI-URBAN	\$ 14,400	25
PIT01	PIT RD.	0.8	HCB	7	Resurface 0.8km Rural HCB Road	RURAL	\$ 115,200	300
SOU11	SOUTH MCNAUGHTON RD	2.4	HCB	7	Resurface 2.4km Rural HCB	RURAL	\$ 345,600	300
SOU04	SOUTH MCNAUGHTON RD	2.7	LCB	7	Resurface 2.7km Rural LCB	RURAL	\$ 243,000	300
2020								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
FER02	FERGUSLEA RD	1.4	LCB	7	Resurface 1.4km PDST	RURAL	\$ 126,000	300
BON01	BONNECHERE RD	2.8	LCB	7	Resurface 2.8km Rural LCB	RURAL	\$ 252,000	300
SOU12	SOUTH MCNAUGHTON RD	1.9	HCB	7	Resurface 1.9km Rural HCB	RURAL	\$ 273,600	300
SOU05	SOUTH MCNAUGHTON RD	1.7	LCB	7	Resurface	RURAL	\$ 153,000	300

2021								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
LAU01	LAUREL CRESCENT	0.14	HC	5	Gravelled	RURAL	\$ 6,300	25
BUR03	BURWELL RD	0.8	HC	5	Gravelled	RURAL	\$ 36,000	125
RIV01	RIVERVIEW DRIVE	0.6	HC	5	Gravelled	RURAL	\$ 27,000	125
SNA03	SNAKE RIVER LINE	1.5	SST ON HCB	7	1.5km HCB resurface	RURAL	\$ 135,000	700
SNA02	SNAKE RIVER LINE	1.8	SST ON HCB	7	1.8km HCB Resurface	RURAL	\$ 162,000	700
SOU08	SOUTH MCNAUGHTON RD	1.7	LCB	7	Resurface PDST	RURAL	\$ 153,000	700
RIC02	RICE LINE	1.8	LCB	8	Resurface 1.8km Rural LCB	RURAL	\$ 162,000	300
2022								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
MOU01	MOUNT ST. PATRICK RD	0.15	LCB	6	Gravelled	RURAL	\$ 6,750	125
MOU02	MOUNT ST. PATRICK RD	0.7	LCB	6	Gravelled	RURAL	\$ 31,500	125
BAR01E	BARR LINE	1.8	HC	7	Resurface Rural HCB	RURAL	\$ 259,200	700
BAR01C	BARR LINE	1.8	HC	7	Resurface Rural HCB	RURAL	\$ 259,200	700
MIC09	MICKSBURG RD.	1.9	HC	7	1.9km HCB Resurface	SEMI-URBAN	\$ 273,600	700
RIC01	RICE LINE	1.5	LCB	8	Resurface 1.5km Rural LCB	RURAL	\$ 135,000	300
2023								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
SOU06	SOUTH MCNAUGHTON RD	0.3	LCB	8	Resurface	RURAL	\$ 27,000	300
SOU07	SOUTH MCNAUGHTON RD	0.8	LCB	8	Resurface 0.8km Rural LCB	RURAL	\$ 72,000	300
PIN01A	PINE VALLEY RD.	1.1	LCB	8	Resurface 1.1 km Rural LCB	RURAL	\$ 99,000	300
MCG03	MCGAGHRAN RD.	1.4	LCB	8	Resurface 1.4 Rural LCB	RURAL	\$ 126,000	300
MCG02	MCGAGHRAN RD.	2.8	LCB	8	Resurface 2.8km rural LCB	RURAL	\$ 252,000	300
CUL02	CULHANE RD	2	LCB	8	Resurface 2.0km Rural LCB	RURAL	\$ 180,000	300
2024								
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost	Traffic Count
FIT01	FITZPATRICK ST.	0.6	LCB	3	2013 Reconstruct as Rural - Pulverize Existing and Gravel	SEMI-URBAN	\$ 54,000	25
EME01B	EMELIN ST.	0.2	LCB	3	Resurface 0.3km Rural HCB	SEMI-URBAN	\$ 18,000	25
KEN01	KENNELLY RD	1.6	LCB	3	Resurface 1.4km Reconstruct 0.2km at RailRoad Crossing	RURAL	\$ 144,000	300
LYN03B	LYNCH RD	0.5	LCB	8	Gravelled	RURAL	\$ 22,500	125
LYN04	LYNCH RD	0.5	LCB	8	Gravelled	RURAL	\$ 22,500	125
NOR02	NORTHCOTE RINK RD	1.7	LCB	8	Gravelled	RURAL	\$ 76,500	125
MCM01	MCMAHON RD	0.6	LCB	8	Gravelled	RURAL	\$ 27,000	125
LYN06	LYNCH RD	0.5	LCB	8	Gravelled	RURAL	\$ 22,500	125
GOL01	GOLF COURSE RD	0.7	LCB	8	Gravelled	RURAL	\$ 31,500	125
FER03	FERGUSLEA RD	0.6	LCB	8	Gravelled	RURAL	\$ 27,000	125

5.5 Disposal

Disposal activities occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option. In the case of road assets, it is not anticipated that the municipality would contemplate disposing of any of these assets.

5.6 Expansion Activities

Expansion activities are planned activities required to extend services to previously unserved areas – or to upgrade services to meet growing demands. No expansion activities are planned over the 10 year planning period.

5.7 Changes to Surface Type

When considering changes to surface type, the Township shall consider the following schedule, which sets out recommended surface types based upon the level of traffic. These surface types are designed to provide the municipality with the lowest possible servicing cost while maximizing the level of service provided.

For traffic levels less than this, gravel roads are recommended with provisional calcium to address any dust generation. For traffic volumes greater than 200 AADT, some form of surface treatment is strongly recommended.

AADT	Truck Traffic	Recommended Surface Type*
0-49	Any	Gravel
50-199	Any	Gravel and Calcium
200-399	<10%	DST
	>10%	HCB 1 lift
400-999	<10%	HCB 1 lift
	>10%	HCB 2 lifts
1000+	Any	HCB 2 lifts
All semi-urban and urban roads to be HCB surfaced.		
*Based upon level of traffic, in accordance with MTO Guide "Roads Management Plan for Small Lower Tier Municipalities - Methods and Inventory Manual - MTO MAY 1987"		

Table 2: Surface type and traffic level

5.8 Current Strategies

Maintenance and capital reinvestment in the Township's roads has kept most of these assets in average to good condition. Over the past few years the township was able to renew 20 km with assistance from various funding programs including the Building Canada Fund and the Federal Gas Tax Program. The capital program has been developed based on a worst first scenario. The current strategies used and the cost of each strategy for road renewal and replacement are:

- For surface treated roads
 - Single treatment every 3-4 years- \$18,000/km
 - Total Resurfacing every 15 years- \$38,000/km

Paved roads at a Condition Index of <6 will continue on a worst first basis and be resurfaced when they reach a Condition Index of 4.

For unpaved roads the timeframe will be a 7 year cycle.

- 75mm Granular resurfacing every 7th year - \$8,500/km
- Grading annually for 195 km.

Maintenance activities for the township's roads are undertaken by in-house staff using the township's own equipment. This includes all routine maintenance for roads such as: pothole patching, shoulder grading, sign maintenance, winter maintenance, surface grading (unpaved), and replacement of small diameter culverts on unpaved roads. The current annual \$600,000 maintenance budget meets the needs of the department.

5.9 Planned Strategies

Key Indicator	Category	Current Practice	Current Controls	Action Plan
Condition	Existing paved roads 28.7 km rural HBC AADT <200	Past practice has been Maintain "As Is"	Pavement evaluations are completed on a 4 year cycle, which in turn updates the condition index	Maintain as existing, until road condition deteriorates to an unacceptable level. Consider conversion to gravel at that time.
Condition	Existing paved roads 12.2 km semi-urban HBC AADT 0-1000	Past practice has been Maintain "As Is"	Pavement evaluations are completed on a 4 year cycle, which in turn updates the condition index	Maintain as existing, until road condition deteriorates to an unacceptable level. Consider conversion to surface treatment at that time.
	Existing Surface Treated Roads 87 km AADT <200	Convert to Gravel and maintain for the long term.	Pavement evaluations are completed on a 4 year cycle, which in turn updates the condition index	Maintain surface treated road as surface treated road until next resurfacing. Convert to Gravel at end of life and maintain for the long term.
	Existing Surface Treated Roads 87 km AADT >200	Past practice has been Maintain "As Is"	Apply a single capping layer to surface treated road at 3-4 years after resurfacing.	Maintain surface treated road as surface treated road until next resurfacing. 15 year resurfacing program on a worst first basis. Pavement evaluations are completed on a 4 year cycle, which in turn updates the condition index to determine worst first roads.
Condition	Existing 190 km unpaved roads	Regular Maintenance	In the 6th year after an unpaved road is resurfaced, the timeframe between routine grading is shorter and the overall condition is poor. Consider for resurfacing at this time.	Regular Maintenance is sufficient for ratepayer needs until next resurfacing. 7 year cycle for granular resurfacing with annual maintenance such as grading, patching and dust suppressant.

Table 3: Planned Strategies

6.0 Financing Strategy

The Financing Strategies section describes how the Township might put the identified asset management strategy into action, from a financial perspective. For the scenarios chosen by Council, (representing the desired level of service), requisite capital infrastructure spending has been determined.

Funding Scenario 4 will allow the Township to achieve the desired goals and objectives. However at a yearly cost of \$898,028, Funding Scenario 4 will require an increase to the capital budget. The current maintenance budget will be maintained at \$600,000 and the capital budget increase will have to be phased in. Currently the Township's budget for capital improvements to linear assets is \$273,583 which includes federal gas tax funding of \$83,583. In 2014 there will be an increase to the capital budget with Municipal Infrastructure Initiative Funding in the amount of \$216,400. This will still leave a funding gap of \$408,045. The following options to close the gap are being considered:

1. 1% tax rate increase per year will fund \$12,000 annually for a total of \$120,000 over ten years.
2. In 5 years a capital loan will be paid off reducing principal payments by \$55,000 per year. If added to the capital budget this would amount to \$275,000 over 5 years.

Therefore by 2024 the funding gap would be reduced to \$13,045 per year however without other funding between 2014 and 2024 to help close the gap the Township will continue to fall further behind resulting in an overall road condition much lower than the Target in Scenario 4 and with much higher annual maintenance costs which may reduce the resources available for capital investment.

The following items impact on the Township's ability to fund the gap:

- The Recent Roads Appraisal Study indicated that 47% or 156 km of our roads are deficient. 37 of these km are gravel and 119 km are paved and surface treated roads which are more costly to rehabilitate.
- Admaston/Bromley has 317.9 km of road, the longest in Renfrew County.
- The current annual amount spent on road reconstruction is 14% of the annual depreciation for linear assets. This creates an infrastructure deficit of \$1.2 Million each year.
- The road surface depreciation is \$225,000 per year. The Township dedicates its federal gas tax funds of \$83,315 strictly towards surface treated roads however our annual deficit is still \$141,685.
- The road base depreciation is \$1.2 Million per year. The Township allocates approximately \$100,000 each year towards road base and gravel roads however our an annual deficit is still \$1.1 Million.
- The Township has \$479,000 of outstanding debt and current reserves of \$132,000.
- The Assessment Base is 24% farm and managed forest; and

- The Township is zoned 40% agriculture, crown land and county forest therefore development is very limited.

Without funding the Townships linear assets will deteriorate further and the ability to reduce the public health and safety issues will be lost.

6.1 Accountability & Feedback

Performance Measures

In addition to the performance measures included in the Municipal Performance Measurement Program for Roads, the Township of Admaston/Bromley will supplement the list with the measures shown in the table below. These measures will be included in an annual report posted on the Township's website by March the following year.

Financial	Quality	Management
% annual (\pm) change in net book value of road assets.	% of roads at a condition rating of 6 or better.	% of capital rehabilitation projects completed on time and within budget

6.2 Term of the Plan

This plan will cover the period January 1, 2014 to December 31, 2024. At the beginning of every year the costs included in the plan will be updated. The plan will undergo a thorough review once every 4 years as soon as possible following the election of a new council. Therefore the 1st major review of this document will be January 2015.

7.0 Conclusions and Recommendations

The implementation of this Asset Management Plan will provide guidance for this and future councils and staff to meet the needs of ratepayers and improve our infrastructure over the timeframe in this plan. The benefits of this plan is knowing the total lifecycle costs that will improve council and staff's ability to select options for operation, maintenance, renewal and replacement of roads that provide the lowest long-term cost, and also supports preserving our quality of life.

The following recommendations are as follows:

1. That Council receive Jp2g's "Asset Management Plan"; and,
2. That Council adopt the plan as an input into the annual budget process necessary to facilitate Council in their decision making process: and,
3. That the Asset Management Strategies as attached be updated from time to time in accordance with changes to best management practices, technology, financial constraints and the outcome of asset condition assessments.

Appendix A – Methodology

Road Appraisal Study

The Road Appraisal Study was conducted in accordance with the ROADS MANAGEMENT PLAN FOR SMALL LOWER TIER MUNICIPALITIES - METHODS AND INVENTORY MANUAL - MTO MAY 1987. Roads were assigned a numeric rating from 1 – 10 based on their condition, perfect roads are given a value of 10, roads should typically be resurfaced when they reach a rating of 5, and that ratings less than 5 may require reconstruction.

Determination of Roads Capital Costing

The above Road Appraisal Study information, along with road surface classification information, was used to assign degradation rates and generate costs to resurface each type of road. Degradation rates assigned to each road surface are as follows:

<u>Road Type</u>	<u>Assigned Degradation</u>
Gravel	No degradation rate assigned in accordance with the MTO Manual, typical maintenance is assumed to be sufficient.
Low Class Bitumous (LCB)	0.33 units per year decline rate, it would take up to 15 years for a brand new LCB road to require resurfacing
High Class Bitumous (HCB)	0.25 units per year decline rate, it would take 20 years for a brand new HCB road to degrade to the point where it requires resurfacing.

The determined Road Condition Rating is progressively reduced in each future year using an Excel spreadsheet program that is used to track scheduled capital activities. Each road, in each year has a predicted road condition, an activity cell, a costing cell, and a traffic cell. If work is desired in a given year, an “X” is marked into the activity cell, and the pricing cell automatically calculates the inflation adjusted activity cost. In the subsequent year, the condition rating of the road is increased as shown below:

<u>Activity</u>	<u>Impact upon Road Condition</u>
Road Reconstruction	Road Condition increased to 10
Road Surface Rehabilitation	Road Condition increased to 8

As previously described, the following Road Conditions in a given year are used as triggers for when work should be considered.

<u>Condition</u>	<u>Activity</u>
7.5	Consider crack-sealing (for future consideration)
>6.0	No Action Required
~5.0	Resurfacing should be considered
4.0 or Less	Reconstruction should be considered

This analysis, conducted over the 10 year period, creates the primary schedule for works. This schedule is subsequently modified to flatten out the costs by shifting projects forwards or backwards in time. Also, multiyear projects are identified at this stage and the appropriate lengths of construction in each year are determined.

From this information the Excel program summarizes the overall system condition and the capital construction costs for each year of the plan.

Future Expansion of Excel Program

It is anticipated that as the asset management plan expands, the Excel program can be easily expanded to include items such as gravelling, shouldering, crack sealing or other maintenance items.

Appendix E – Supplementary Information