

ASSET MANAGEMENT PLAN

for the
Township of Brudenell, Lyndoch & Raglan



Prepared by:

Jp2g Consultants Inc.
12 International Drive
Pembroke, Ontario
K8A 6W5

December 2013
Project No. 2135367A



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ENGINEERS • PLANNERS • PROJECT MANAGERS

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1.0 Executive Summary

The Township of Brudenell, Lyndoch & Raglan'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 5.2 out of 10. A service level of between 6 and 7 is desired. Six 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 all 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 \$420,000/year (present value) for the initial 10 year capital planning period would be required in order to deliver the desired level of service and to maintain a safe road network system.

Based on financial projections of this level of capital spending, the municipality will have a future projected deficit of approximately \$10,000,000 at the end of the 10 year period. The yearly funding gap will exceed of the Township's current debenture limit, and the capital spending will not be possible without innovative financing strategies and provincial funding.

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 Brudenell, Lyndoch & Raglan is a lower-tier municipality within the County of Renfrew. It is situated in the south-west corner of the County, with the Townships of Madawaska Valley and Killaloe, Hagarty & Richards to the north and the Townships of Bonnechere Valley and Greater Madawaska to the east. Although considered a rural municipality, it has small areas of semi-urban population located in the hamlets of Palmer Rapids & Quadeville. The Madawaska River runs through the centre of the Municipality. It is home to approximately 1,650 residents, living in approximately 1,000 privately owned dwellings.

The Township of Brudenell, Lyndoch & Raglan 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.

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.

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 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 Needs 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 regular maintained municipal road network consists of approximately 197 km of roads. 43.2 km of these roads are 'chip and dip' surface treated, 9.1 km are paved and the remaining 145 km are gravel roads. Approximately 75 km of County Roads and 23 km of Provincial Highway (Hwy 28) are also located within the municipality.

Brudenell, Lyndoch & Raglan Township maintains 197 km of roadway on a year round basis; approximately 17 km of the road network is not maintained during the winter months. The Roads Needs Study encompassed only those roads maintained on a year round basis: 52.3km of local rural roads, of which 43.2 km are LCB 'chip and dip' and 9.1 km are HCB.

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 \$69,000,000. 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 needs 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 Brudenell, Lyndoch & Raglan are over 20 years old or more, and in need of attention. Much of the system is functioning beyond its expected useful life, and has been subject to multiple resurfacing, while the road base has continued to deteriorate. Over the 10 year planning period, it is expected that at least 70% or 36.3 km (all Poor, Average and Fair condition

roads), of the road system will require capital works such as resurfacing. If this resurfacing is not performed in a timely fashion, partial or complete reconstruction may be required for a majority of the roads currently identified in average condition in order to address the anticipated road base deterioration.

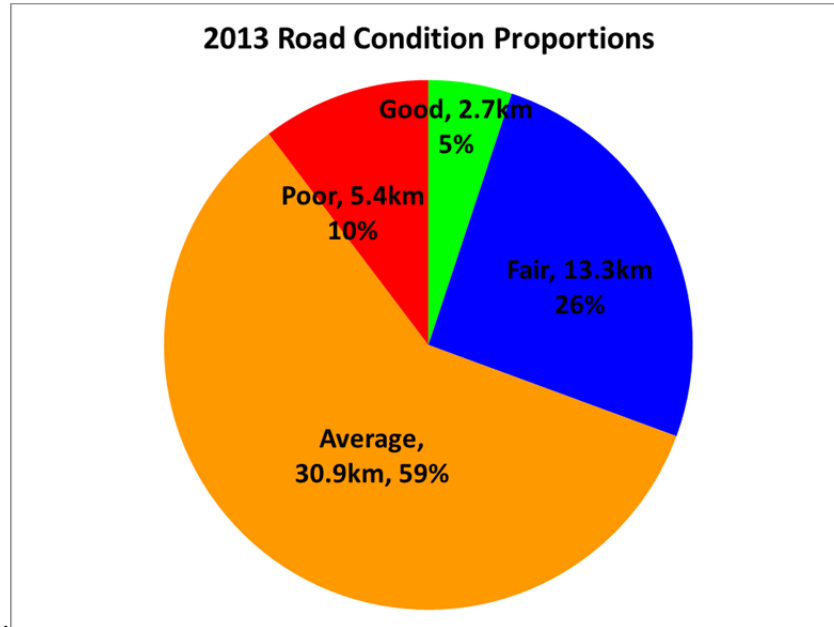


Figure 1: 2013 Road Condition Properties

As indicated in the above pie chart, a significant proportion of municipal road assets are categorized as “Average” (condition: 4 or 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.

Specific recommendations for capital works and the detailed road inventory are included in the Roads Needs Study (Appendix B).

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. Brudenell, Lyndoch & Raglan Township therefore has no bridge assets.

3.3 Water

The Township of Brudenell, Lyndoch & Raglan does not have a municipal water supply.

3.4 Sewage

The Township of Brudenell, Lyndoch & Raglan does not have any municipal sanitary sewers, or wastewater treatment plants.

3.5 Stormwater

The Township of Brudenell, Lyndoch & Raglan maintains the roadside ditch system within municipal right of ways as the stormwater management system. These items have been accounted for within the Roads Needs Study, and any required improvements are noted on the respective roads inventory sheet.

Inventories and replacement valuation of these items are also addressed within the Roads Needs Study (Appendix B).

3.6 Social Housing

The Township of Brudenell, Lyndoch & Raglan 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 5 years. Such an update will require a new Road Needs 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 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

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 Needs 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 **6 and 7 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 **5.2 out of 10**, which is below the target value. Significant Capital Investment will be required to reach the stated service level target.

Based upon capital expenditures recommended in the 2013 Roads Needs Study, and given the performance expected over the plan period, an average system condition rating of **7.2 out of 10** could

be achieved, given sufficient Capital Investment. This would represent a significant improvement in the overall system condition.

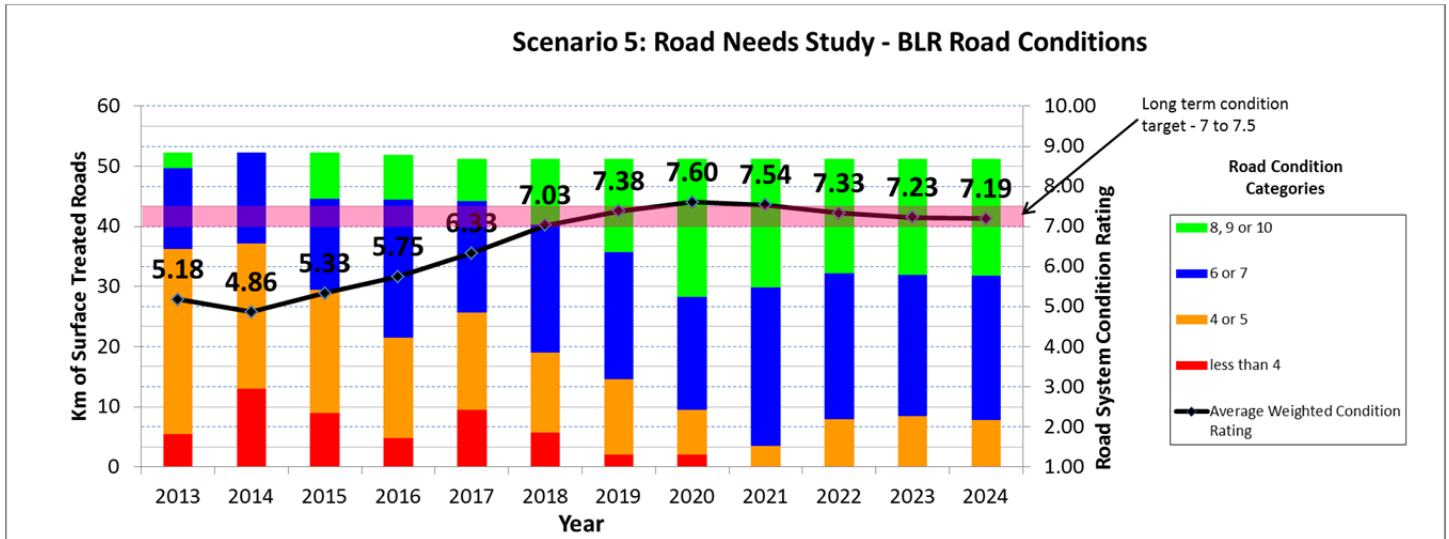


Figure 2: Projected Road System Condition Rating: Roads Needs Study - Scenario 5

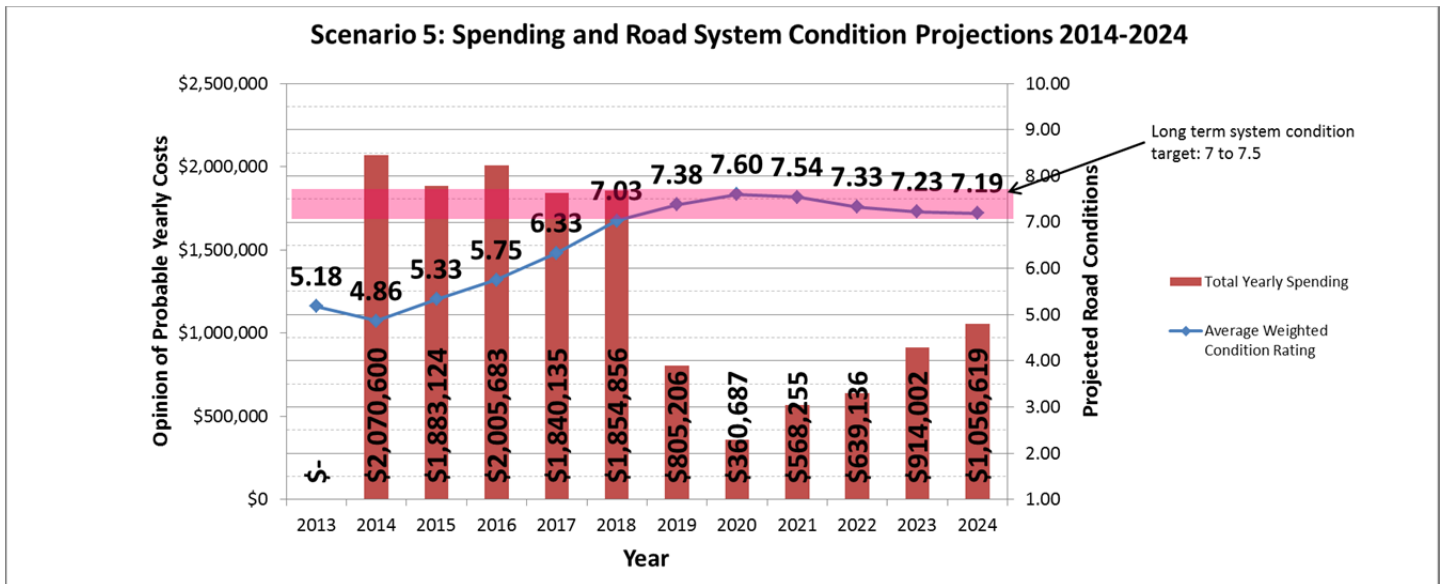


Figure 3: Projected Future Capital Spending: Roads Needs Study - Scenario 5

Under this scenario (one of several possible scenarios) amortized capital spending for the 10 year period would be in the order of \$1.2 million/yr (present value). The overall system condition rating would exceed 7 in 2018, would peak at 7.6 in 2020, and decrease to 7.19 in the 2024 period. The 10 year average system condition rating is 6.69, which is consistent with the stated Municipal goal of maintaining a rating between 6 and 7.

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.

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.

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.

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.

Gravel roads in the municipality are in poor condition, and it is understood that this is as a result of the difficulty in obtaining a reliable supply of gravel in proximity to the Township. Once a gravel supply is secured, it is recommended that an analysis detailing the tonne/yr requirement be performed and that a long term gravelling program be established.

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.

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

Ditching has also been included as a line item in all reconstruction or rehabilitation activity (See Roads Needs 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 Needs 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. Based upon the existing condition of HCB roads, it is not anticipated that any roads within the municipality would be candidates for this maintenance treatment. If any HCB roads are resurfaced, crack sealing should be investigated for application 4-5 years, post resurfacing.

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 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.

Six different 10 year plan scenarios were analyzed, and reviewed by township staff and Council. The six scenarios were as follows:

1. Do-Nothing.
2. Maximum Township staff assistance.
3. Single Surface Treatment for Letterkenny Rd., Roads Needs Study (needs based analysis) all others
4. Double Surface Treatment for Letterkenny Rd., Roads Needs Study (needs based analysis) all others
5. Follow Roads Needs Study (needs based analysis). Includes: reconstruction, rehabilitation, ditching, culverts, topsoil/seeding.
6. Unlimited funding.

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	5.18	1.66	7-7.5	\$ -
2	MAXIMUM TOWNSHIP STAFF ASSISTANCE	5.18	6.40	7-7.5	\$ 235,926
4	LETTERKENNY - SST, ROAD NEEDS STUDY ALL OTHERS	5.18	6.55	7-7.5	\$ 374,423
3	LETTERKENNY - DST, ROAD NEEDS STUDY ALL OTHERS	5.18	6.80	7-7.5	\$ 421,340
5	ROAD NEEDS STUDY	5.18	7.19	7-7.5	\$ 1,209,940
6	UNLIMITED FUNDING SCENARIO	5.18	8.06	7-7.5	\$ 2,154,851

1. Cost is expressed in 2013 dollars, future years budgets to be inflation adjusted.
 2. Changes to these presented values are anticipated as the future condition assessments are conducted.

Detailed information on all 6 scenarios can be found in Appendix C

Based on discussion with council it was decided that Scenario 4, with Letterkenny Road as an elevated priority, was appropriate for the purpose of maintaining health and safety, and delivering the desired level of service.

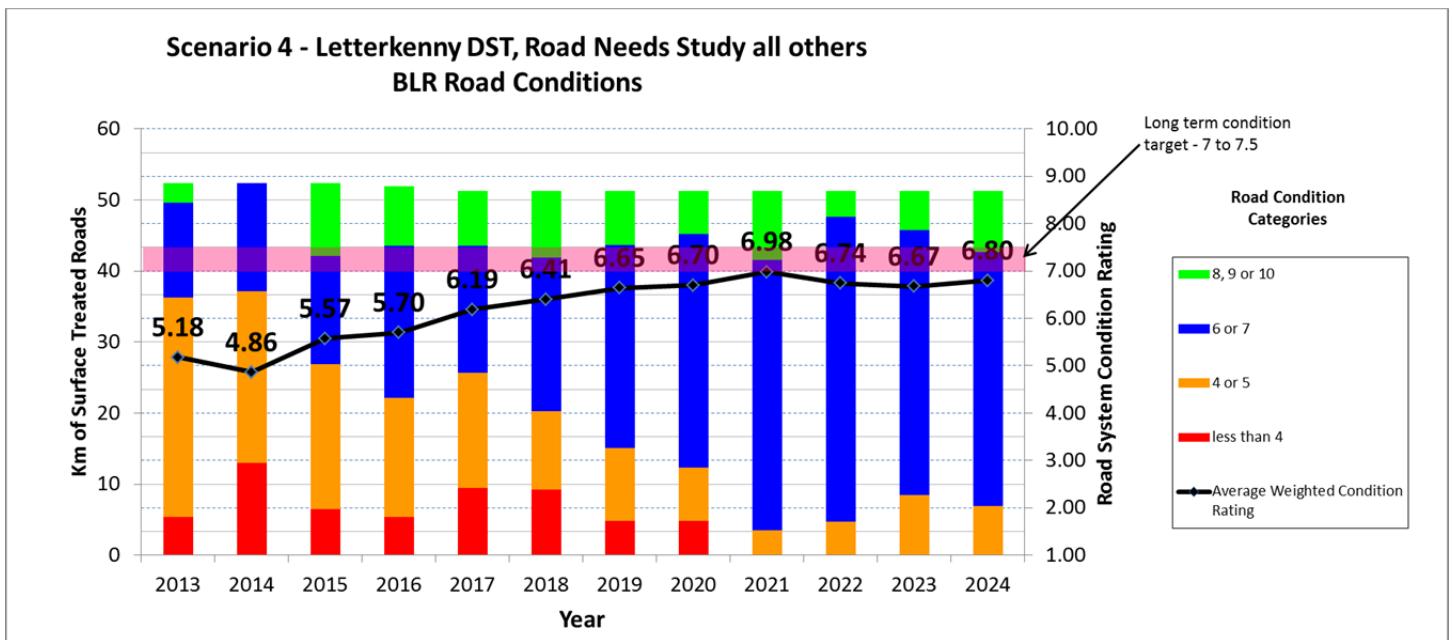


Figure 4: Projected Road System Condition Rating: Modified Scenario 4

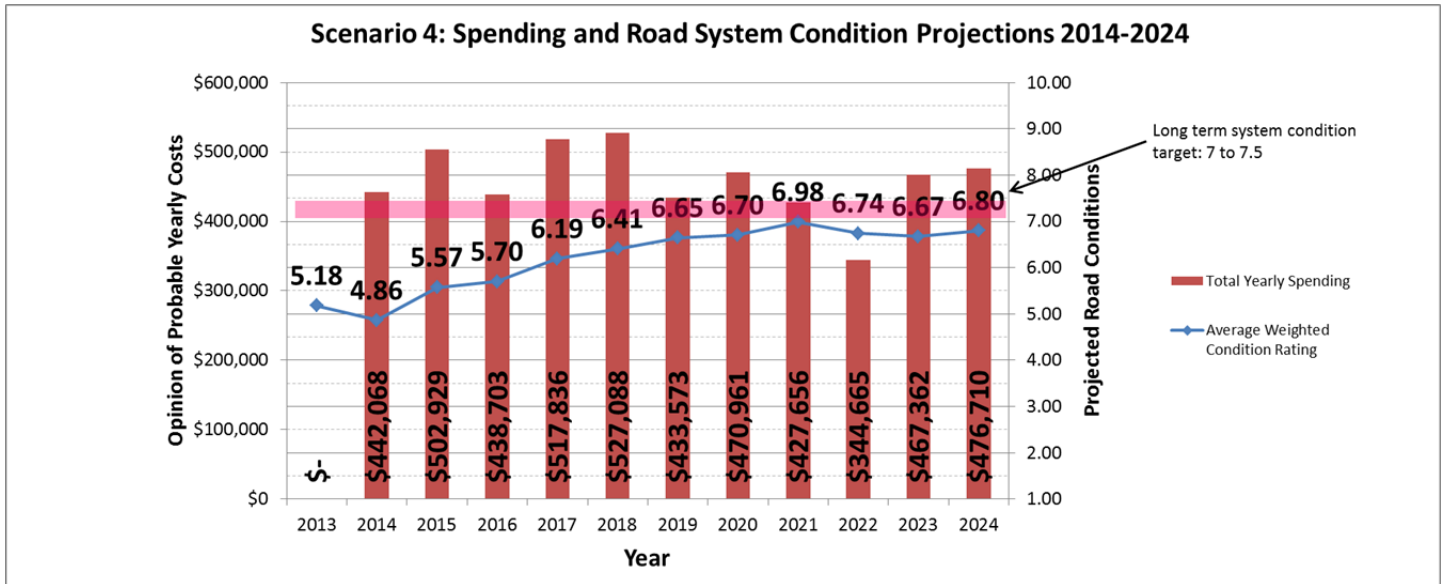


Figure 5: Projected Future Capital Spending: Modified Scenario 4

Under this scenario amortized spending for the 10 year period would be on the order of \$420,000/yr (present value). The overall system condition rating would come close to 7 in 2021, and would decrease to 6.8 in the 2024 period. The 10 year average system condition rating is 6.3, which is consistent with the stated Municipal goal of maintaining a rating between 6 and 7.

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

Scenario 4: DST Letterkenny - RNS other Roads							
2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R096	River Road (Commercial uses)	2.492	HCB	4	Realignment (scheduled)reconstruct 300m resurface 12 in B, scarify 6 in A, DST on top,	RURAL	50000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	100000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	330000
R112	Trout Lake (Quarry Road)	0.6	HCB	4	Replace with same	RURAL	100000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	330000
R069D	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	330000
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069E	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R087	Oscar Boehme	0.8	LCB	6	RURAL LCB REHAB	RURAL	120000
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	330000
R106	Schroeder	0.7	HCB	4	Pick up pavement, mulch pavement, add 300B/150A	RURAL	44000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R002	Addington (Dump Road)	4.3	LCB	7	SST 100% 2013 dead end to Log View 2.1km 3.3 2014 1.6km	RURAL	250000
R014	Cedar Grove	0.9	LCB	7	Scarify, 150A, DST	RURAL	135000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	140000
R011	Burnt Bridge	0.8	LCB	8	RURAL LCB REHAB	RURAL	120000
R082	Moccasin Lake	1.3	LCB	5	0.5km SST Scarify, 300B, 150A, DST 0.5km	RURAL	85000
R066	Keller	3.2	LCB	7	SST cap layer (2016)	RURAL	65000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R019	Cormac	0.5	LCB	7	single coat SST (cap)	RURAL	10000
R092	Raglan White Lake	0.4	HCB	7	RURAL HCB REHAB	RURAL	75000
R010	Burnt Bridge	1.7	LCB	8	RURAL LCB REHAB	RURAL	255000
R081	Mantifel (3 homes)	0.135	HCB	7	RURAL HCB REHAB	RURAL	25000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R077	Lower Rosenthal	0.8	LCB	7	RURAL LCB REHAB	RURAL	120000
R109	Soble	0.173	HCB	8	RURAL HCB REHAB	RURAL	20000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400

Table 2: Schedule of Activities

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.

<u>AADT</u>	<u>Truck Traffic</u>	<u>Recommended Surface</u>
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.		

Table 3: Surface type and traffic level

Engineering experience in Canada and similar climate regions has indicated that surface treated roads and gravel treated roads have approximately equal maintenance costs at the 200 AADT. 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.

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 scenario chosen by Council, (representing the desired level of service), the requisite capital infrastructure spending has been determined.

Scenario 4 has been merged into a Long Term Financial plan for the municipality. Key assumptions used in the preparation of this Long Term Financial Plan are contained within Appendix A.

Maintenance activities remain at status quo within these plans. It is anticipated that maintenance items will be reviewed in upcoming years.

Table 3 indicates that if the Township were to undertake the capital work items described within Scenario 4, the anticipated funding shortfall is anticipated to be \$9,850,000., The Municipality will not be able to sustain this level of spending from its current debenture limit, and would be required to substantially raise levy rates, once reserves and the debenture is exhausted. If the municipality were to have received Small Northern and Rural Infrastructure Funding, it could have reduced this funding shortfall by approximately \$2,000,000 and address a high priority roadway.

As outlined in *Building Together: Guide for Municipal Asset Management Plan*, service level goals should be progressively reduced from the desired level (provided that the result does not compromise safety or other critical measures), in order to reduce the required funding to confirmed sources of revenue and available budget. The result of this analysis becomes the funding constrained scenario for the Township. The constrained scenario should be continually revised until all funding gaps have been removed. If the funding gap cannot be revised away, the potential implications to municipal services should be documented.

Using the “Do-Nothing –Scenario 1” as an input into the Long Term Financial Model, we can see from Table 4 below that the municipality will have a unfunded balance of \$4,786,000, even if no capital road works are undertaken in the next 10 years. Under this scenario, the road conditions will deteriorate to an unacceptable level of service **(3.35)**, and safety risks to the travelling public will increase.

It is clear that the Township of Brudenell, Lyndosch & Raglan will require some level of provincial funding in order to maintain the safety of its road network. The Municipality will also have to investigate other financing strategies if they wish to meet their desired service levels.

Financial Analysis 2014-2024 - Scenario 4																		
			2011	2012	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
			Actual	Budget	Actual	Budget	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected		
General Government			242,184	316,624	315,482	357,827	305,164	311,268	317,493	323,843	330,320	336,926	343,665	350,538	357,549	364,700	371,994	
Fire Department			90,979	150,392	137,379	153,269	127,209	129,753	132,348	134,995	137,695	140,449	143,258	146,123	149,046	152,027	155,067	
Building Department			1,582	300	8,009	31,946	31,946	32,585	33,237	33,901	34,579	35,271	35,976	36,696	37,430	38,178	38,942	
Livestock Valuers			4,312	500	2,239	400	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	
Policing Services			128,344	175,060	169,519	188,425	204,441	394,539	398,329	402,119	405,909	409,699	413,489	417,279	421,069	424,859	428,649	
911			1,653	1,500	857	1,300	1,328	1,354	1,381	1,409	1,437	1,466	1,495	1,525	1,555	1,586	1,618	
Transportation Services			633,348	750,216	610,764	943,504	1,079,666	1,153,280	1,102,061	1,194,460	1,217,245	1,137,533	1,189,000	1,160,056	1,091,713	1,229,351	1,253,939	
Transportation Other			142,513	140,000	135,632	140,000	142,800	145,656	148,569	151,541	154,571	157,663	160,816	164,032	167,313	170,659	174,072	
Transportation Services - Road Maintenance			484,965	503,458	467,101	532,329	494,798	504,694	514,788	525,084	535,586	546,297	557,223	568,368	579,735	591,330	603,156	
Transportation Services - Roads Capital			5,870	-	8,031	271,000	442,068	502,929	438,703	517,836	527,088	433,573	470,961	427,656	344,665	467,362	476,710	
Streetlights			5,322	5,500	6,603	8,000	6,356	6,483	6,613	6,745	6,880	7,018	7,158	7,301	7,447	7,596	7,748	
Environmental Services			139,655	126,966	104,196	147,299	147,299	129,529	132,120	134,762	137,457	140,206	143,010	145,871	148,788	151,764	154,799	
Recreational and Cultural Services			28,308	40,834	35,061	37,967	35,543	36,253	36,978	37,718	38,472	39,242	40,027	40,827	41,644	42,477	43,326	
Planning and Development			2,581	500	680	500	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	
Total Expenditures			1,278,268	1,568,392	1,390,789	1,870,437	1,941,880	2,197,972	2,163,488	2,272,880	2,312,923	2,250,737	2,320,007	2,309,144	2,259,168	2,415,466	2,459,010	
Total Revenue				1,565,861		1,866,506	1,273,850	1,292,110	1,310,662	1,329,513	1,348,667	1,368,130	1,387,906	1,408,003	1,428,425	1,449,178	1,470,268	
Surplus				2,531		3,931	- 668,030	- 905,863	- 852,826	- 943,368	- 964,256	- 882,608	- 932,100	- 901,141	- 830,743	- 966,288	- 988,742	
Cumulative Surplus(Deficit)				1,568,392			- 668,030	- 1,573,893	- 2,426,718	- 3,370,086	- 4,334,342	- 5,216,950	- 6,149,050	- 7,050,191	- 7,880,934	- 8,847,223	- 9,835,965	

Table 4: Financial Analysis Scenario 4

Financial Analysis 2014-2024 - Do Nothing Roads Scenario																		
			2011	2012	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
			Actual	Budget	Actual	Budget	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected		
General Government			242,184	316,624	315,482	357,827	305,164	311,268	317,493	323,843	330,320	336,926	343,665	350,538	357,549	364,700	371,994	
Fire Department			90,979	150,392	137,379	153,269	127,209	129,753	132,348	134,995	137,695	140,449	143,258	146,123	149,046	152,027	155,067	
Building Department			1,582	300	8,009	31,946	31,946	32,585	33,237	33,901	34,579	35,271	35,976	36,696	37,430	38,178	38,942	
Livestock Valuers			4,312	500	2,239	400	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	1,863	
Policing Services			128,344	175,060	169,519	188,425	204,441	394,539	398,329	402,119	405,909	409,699	413,489	417,279	421,069	424,859	428,649	
911			1,653	1,500	857	1,300	1,328	1,354	1,381	1,409	1,437	1,466	1,495	1,525	1,555	1,586	1,618	
Transportation Services			633,348	750,216	610,764	943,504	637,598	650,350	663,357	676,624	690,157	703,960	718,039	732,400	747,048	761,989	777,229	
Transportation Other			142,513	140,000	135,632	140,000	142,800	145,656	148,569	151,541	154,571	157,663	160,816	164,032	167,313	170,659	174,072	
Transportation Services - Road Maintenance			484,965	503,458	467,101	532,329	494,798	504,694	514,788	525,084	535,586	546,297	557,223	568,368	579,735	591,330	603,156	
Transportation Services - Roads Capital			5,870	-	8,031	271,000												
Streetlights			5,322	5,500	6,603	8,000	6,356	6,483	6,613	6,745	6,880	7,018	7,158	7,301	7,447	7,596	7,748	
Environmental Services			139,655	126,966	104,196	147,299	147,299	129,529	132,120	134,762	137,457	140,206	143,010	145,871	148,788	151,764	154,799	
Recreational and Cultural Services			28,308	40,834	35,061	37,967	35,543	36,253	36,978	37,718	38,472	39,242	40,027	40,827	41,644	42,477	43,326	
Planning and Development			2,581	500	680	500	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	1,065	
Total Expenditures			1,278,268	1,568,392	1,390,789	1,870,437	1,499,812	1,695,043	1,724,784	1,755,045	1,785,835	1,817,165	1,849,046	1,881,488	1,914,504	1,948,104	1,982,300	
Total Revenue				1,565,861		1,866,506	1,273,850	1,292,110	1,310,662	1,329,513	1,348,667	1,368,130	1,387,906	1,408,003	1,428,425	1,449,178	1,470,268	
Surplus				2,531		3,931	- 225,962	- 402,933	- 414,122	- 425,532	- 437,168	- 449,035	- 461,139	- 473,485	- 486,079	- 498,926	- 512,032	
Cumulative Surplus(Deficit)				1,568,392			- 225,962	- 628,895	- 1,043,018	- 1,468,550	- 1,905,718	- 2,354,753	- 2,815,892	- 3,289,377	- 3,775,456	- 4,274,382	- 4,786,414	

Table 5: Financial Analysis - Do Nothing Scenario

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

Financial Forecasting Methodology

- Historic actual costs from 2011 and 2012 used as typical
- 2%/yr inflation on costs in each category.
- Historic Roads Capital Spending is approximately zero in 2011, 2012, \$271,000 planned for 2013
- Future roads capital costs based upon Scenario 4
- 2015 OPP costs based on 369\$/household
- Growth of ~10 dwellings per year assumed in the residential tax base (~1% per year)
- OMPF assumed 2% growth.
- No other government grants included.

Methodology

Road Needs Study

The Road Needs 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 Needs 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.

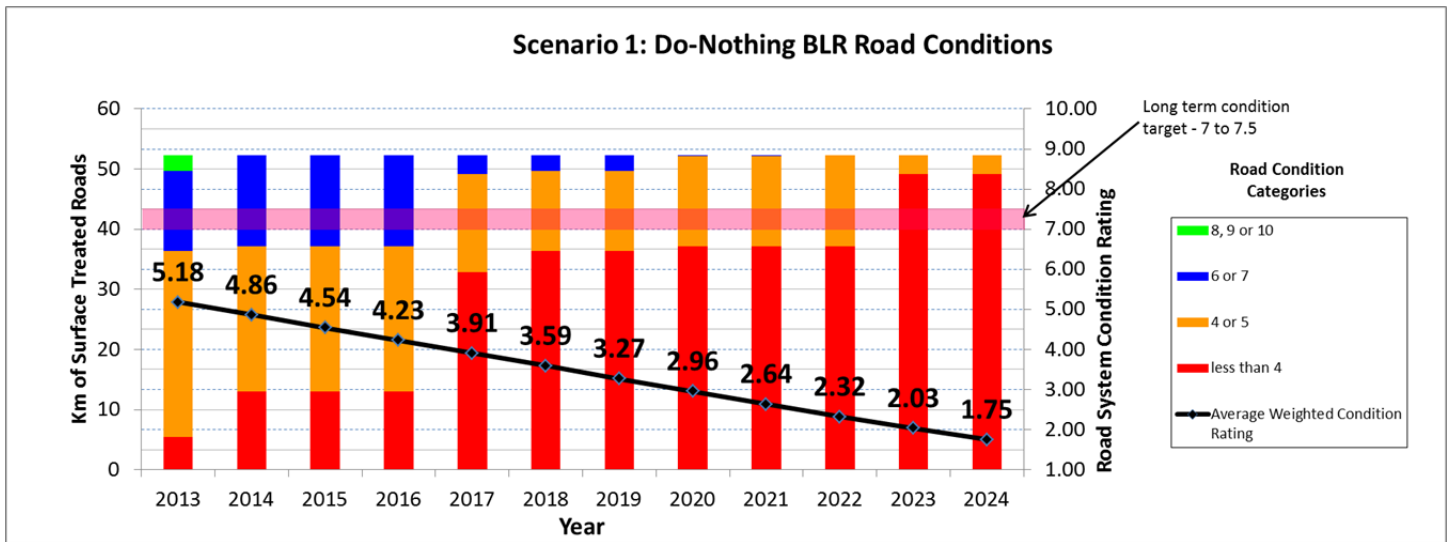
Appendix B – Road Needs Study

Appendix C – Scenarios

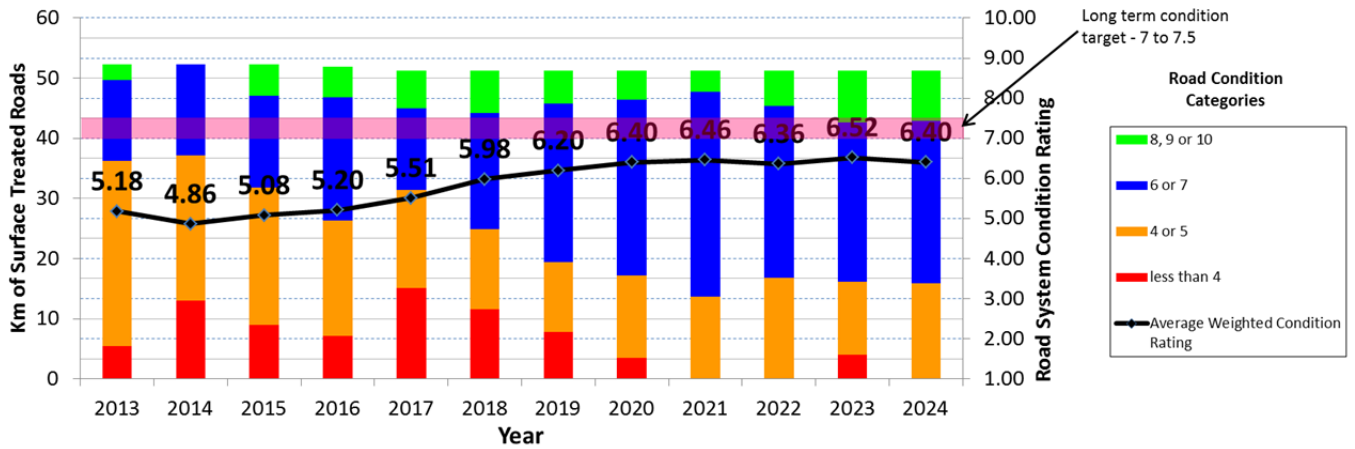
Scenario No.	Scenario Description	Current (2013) Road Condition	End of Period (2024) Road Condition	Road Condition Target	Cost (\$/year)
1	DO-NOTHING	5.18	1.66	7-7.5	\$ -
2	MAXIMUM TOWNSHIP STAFF ASSISTANCE	5.18	6.40	7-7.5	\$ 235,926
4	LETTERKENNY - SST, ROAD NEEDS STUDY ALL OTHERS	5.18	6.55	7-7.5	\$ 374,423
3	LETTERKENNY - DST, ROAD NEEDS STUDY ALL OTHERS	5.18	6.80	7-7.5	\$ 421,340
5	ROAD NEEDS STUDY	5.18	7.19	7-7.5	\$ 1,209,940
6	UNLIMITED FUNDING SCENARIO	5.18	8.06	7-7.5	\$ 2,154,851

1. Cost is expressed in 2013 dollars, future years budgets to be inflation adjusted.

2. Changes to these presented values are anticipated as the future condition assessments are conducted.

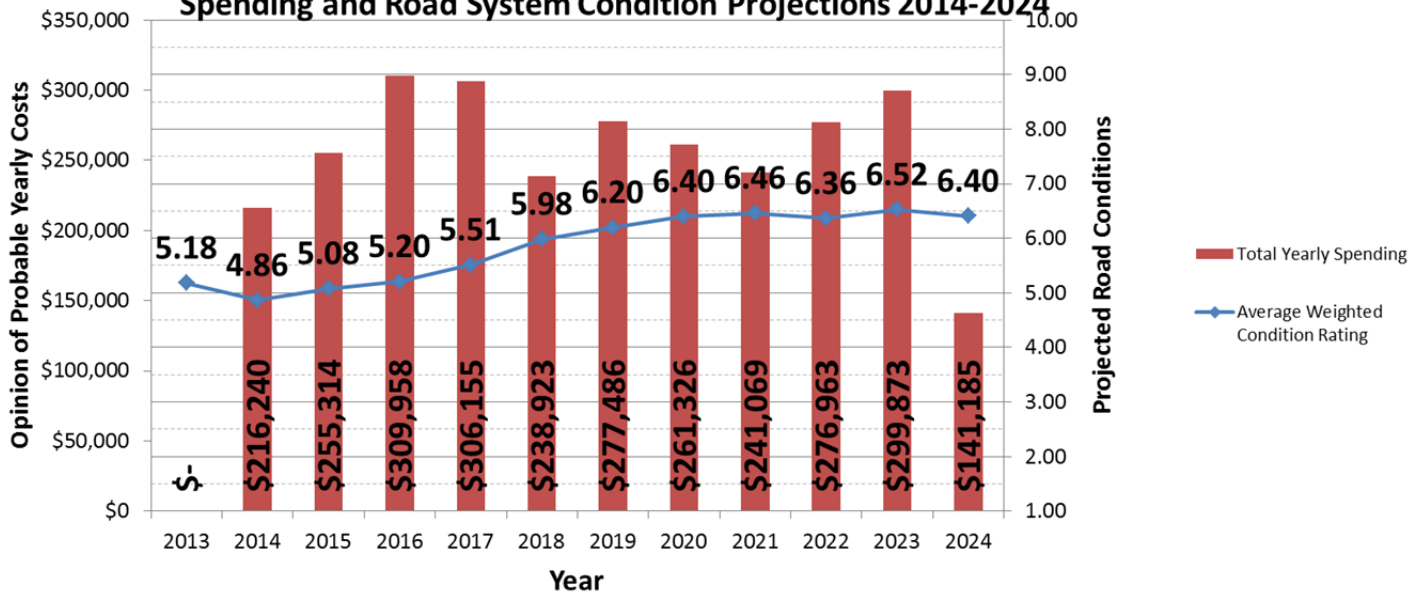


Scenario 2: Significant Staff Effort: BLR Road Conditions



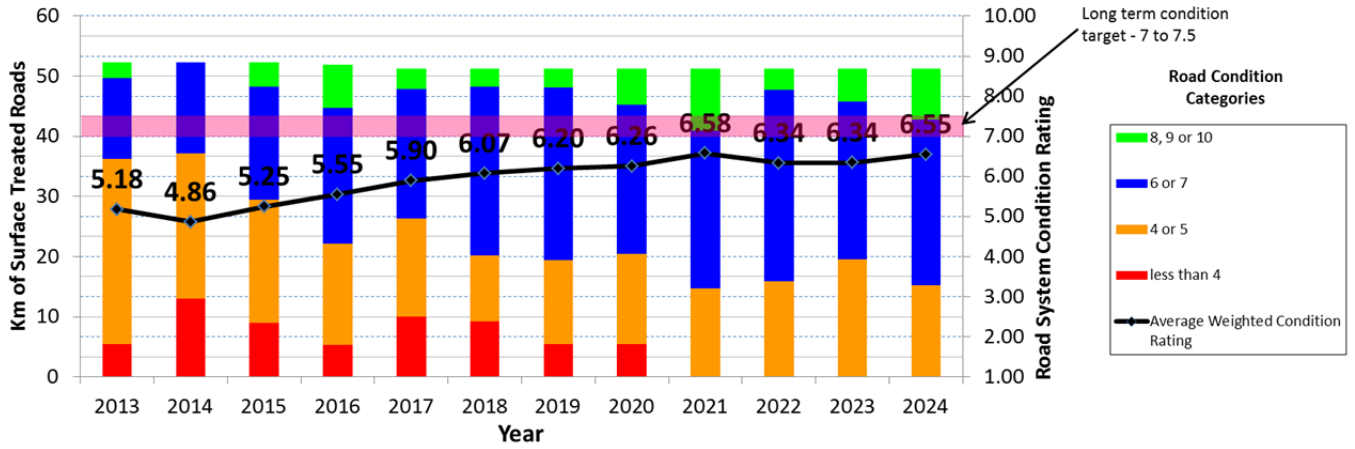
Scenario 2: Significant Staff Effort

Spending and Road System Condition Projections 2014-2024

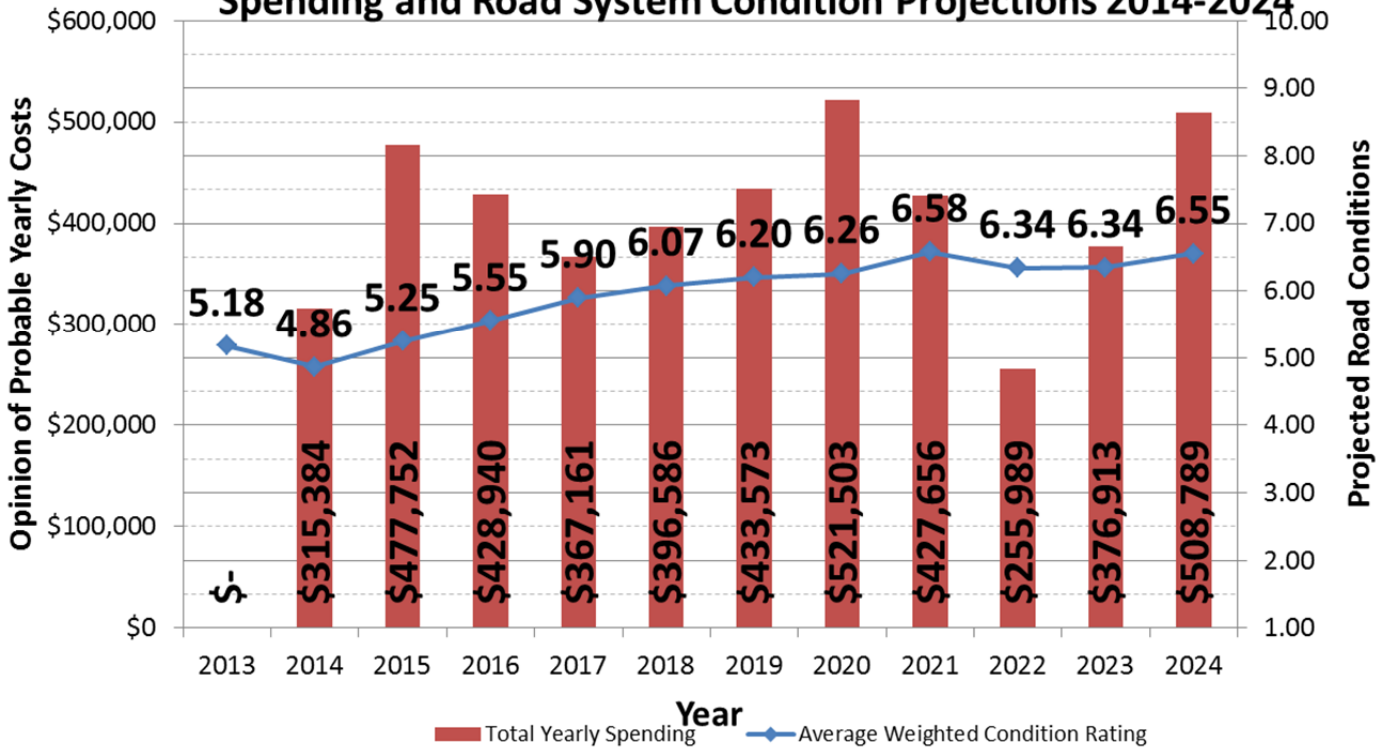


Scenario 2 - Maximum Municipal Assistance							
2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	RESURFACE RURAL LCB	RURAL	\$160,000
R082	Moccasin Lake	1.3	LCB	5	RESURFACE RURAL LCB	RURAL	\$ 52,000
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R072	Little Ireland	0.7	LCB	3	RESURFACE RURAL LCB	RURAL	\$ 28,000
R106	Schroeder	0.7	HCB	4	TURN TO GRAVEL	RURAL	\$ 44,000
R049	Homestead (Old Hwy)	0.4	HCB	4	GRAVEL THIS ROAD	RURAL	\$ 25,000
R069A	Letterkenny	3.71	LCB	5	RESURFACE RURAL LCB	RURAL	\$148,400
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R048	Helferty	0.7	HCB	3	TURN TO GRAVEL	RURAL	\$ 44,000
R096	River Road (Commercial uses)	2.492	HCB	4	RESURFACE RURAL LCB	RURAL	\$ 99,680
R069B	Letterkenny	3.71	LCB	5	RESURFACE RURAL LCB	RURAL	\$148,400
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	RESURFACE RURAL LCB	RURAL	\$134,440
R069C	Letterkenny	3.71	LCB	5	RESURFACE RURAL LCB	RURAL	\$148,400
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069D	Letterkenny	3.71	LCB	5	RESURFACE RURAL LCB	RURAL	\$148,400
R087	Oscar Boehme	0.8	LCB	6	RESURFACE RURAL LCB	RURAL	\$ 32,000
R014	Cedar Grove	0.9	LCB	7	RESURFACE RURAL LCB	RURAL	\$ 36,000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R112	Trout Lake (Quarry Road)	0.6	HCB	4	Resurface Rural HCB Road	RURAL	\$ 78,000
R069E	Letterkenny	3.71	LCB	5	RESURFACE RURAL LCB	RURAL	\$148,400
R019	Cormac	0.5	LCB	7	SST CAP	RURAL	\$ 20,000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	\$455,000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	\$455,000
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	\$ 92,000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	\$455,000
R002	Addington (Dump Road)	4.3	LCB	7	RESURFACE RURAL LCB 1.6km	RURAL	\$ 75,000
R011	Burnt Bridge	0.8	LCB	8	RURAL LCB REHAB	RURAL	\$ 32,000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R077	Lower Rosenthal	0.8	LCB	7	RURAL LCB REHAB	RURAL	\$ 32,000
R066	Keller	3.2	LCB	7	RURAL LCB REHAB	RURAL	\$128,000
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R072	Little Ireland	0.7	LCB	3	RURAL LCB REHAB	RURAL	\$ 28,000
R092	Raglan White Lake	0.4	HCB	7	RURAL HCB REHAB	RURAL	\$ 52,000
R081	Mantifel (3 homes)	0.135	HCB	7	RURAL HCB REHAB	RURAL	\$ 17,550
R010	Burnt Bridge	1.7	LCB	8	RURAL LCB REHAB	RURAL	\$ 68,000

Scenario 3: SST Letterkenny - BLR Road Conditions



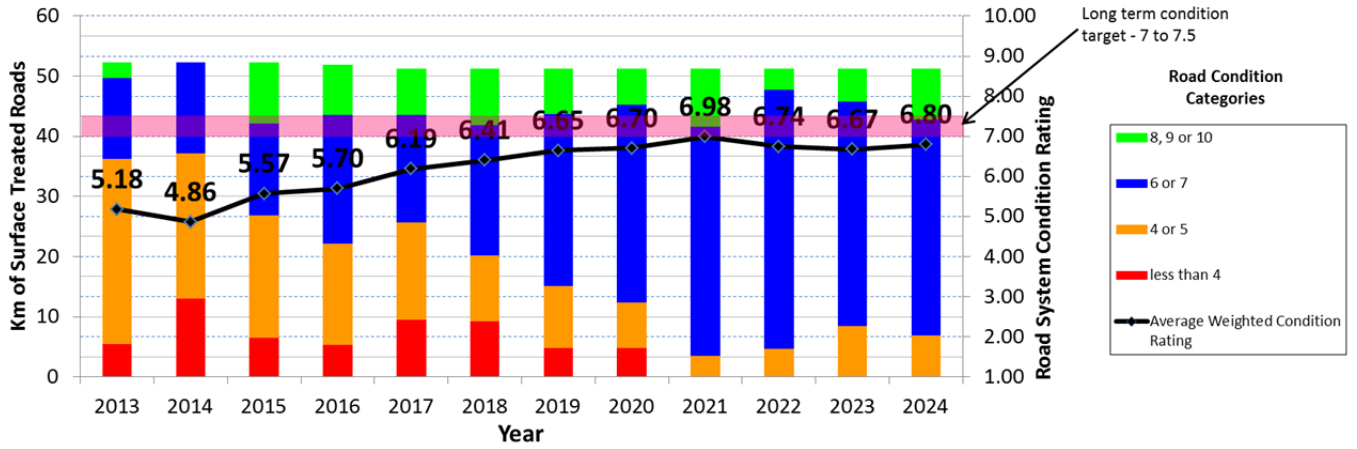
Scenario 3: SST Letterkenny Spending and Road System Condition Projections 2014-2024



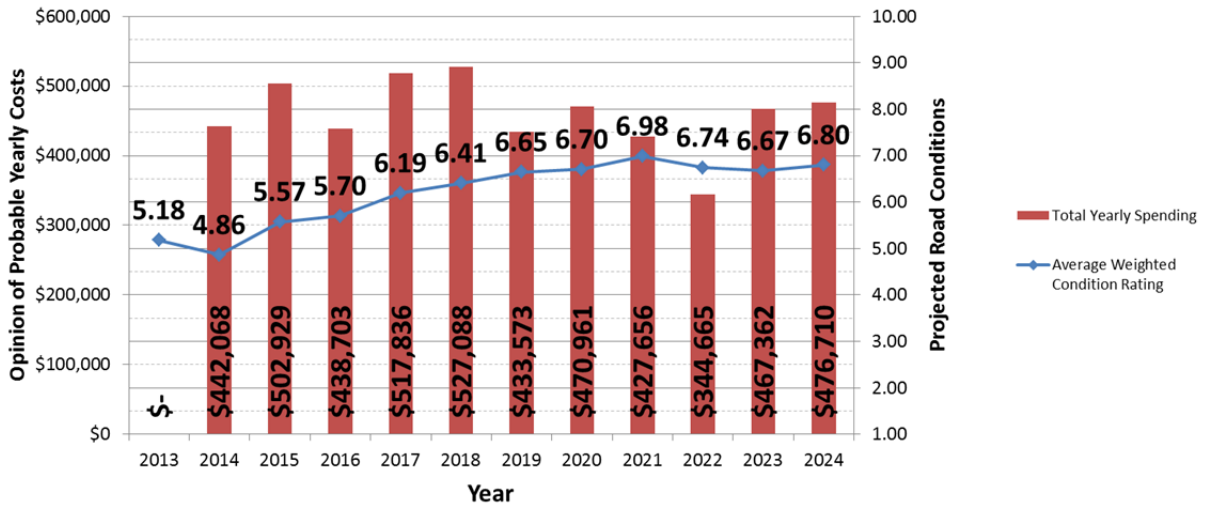
Scenario 3: SST Letterkenny - RNS all others

2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	\$ 100,000
R096	River Road (Commercial uses)	2.492	LCB	4	Realignment (scheduled)reconstruct 300m resurface 12 in B, scarify 6 in A, DST on top,	RURAL	\$ 50,000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	\$ 330,000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R112	Trout Lake (Quarry Road)	0.6	HCB	4	Replace with same	RURAL	\$ 100,000
R069D	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	\$ 330,000
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069E	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
R087	Oscar Boehme	0.8	LCB	6	RURAL LCB REHAB	RURAL	\$ 120,000
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	\$ 330,000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R002	Addington (Dump Road)	4.3	LCB	7	SST 100% 2013 dead end to Log View 2.1km 3.3 2014 1.6km	RURAL	\$ 250,000
R014	Cedar Grove	0.9	LCB	7	Scarify, 150A, DST	RURAL	\$ 135,000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	\$ 140,000
R011	Burnt Bridge	0.8	LCB	8	RURAL LCB REHAB	RURAL	\$ 120,000
R106	Schroeder	0.7	HCB	4	Pick up pavement, mulch pavement, add 300B/150A	RURAL	\$ 44,000
R082	Mocasin Lake	1.3	LCB	5	0.5km SST Scarify, 300B, 150A, DST 0.5km	RURAL	\$ 85,000
R066	Keller	3.2	LCB	7	SST cap layer (2016)	RURAL	\$ 65,000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R019	Cormac	0.5	LCB	7	single coat SST (cap)	RURAL	\$ 10,000
R092	Raglan White Lake	0.4	HCB	7	RURAL HCB REHAB	RURAL	\$ 75,000
R010	Burnt Bridge	1.7	LCB	8	RURAL LCB REHAB	RURAL	\$ 255,000
R081	Mantifel (3 homes)	0.135	HCB	7	RURAL HCB REHAB	RURAL	\$ 25,000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
R077	Lower Rosenthal	0.8	LCB	7	RURAL LCB REHAB	RURAL	\$ 120,000
R109	Soble	0.173	HCB	8	RURAL HCB REHAB	RURAL	\$ 20,000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	\$ 100,000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 74,200

**Scenario 4 - Letterkenny DST, Road Needs Study all others
BLR Road Conditions**



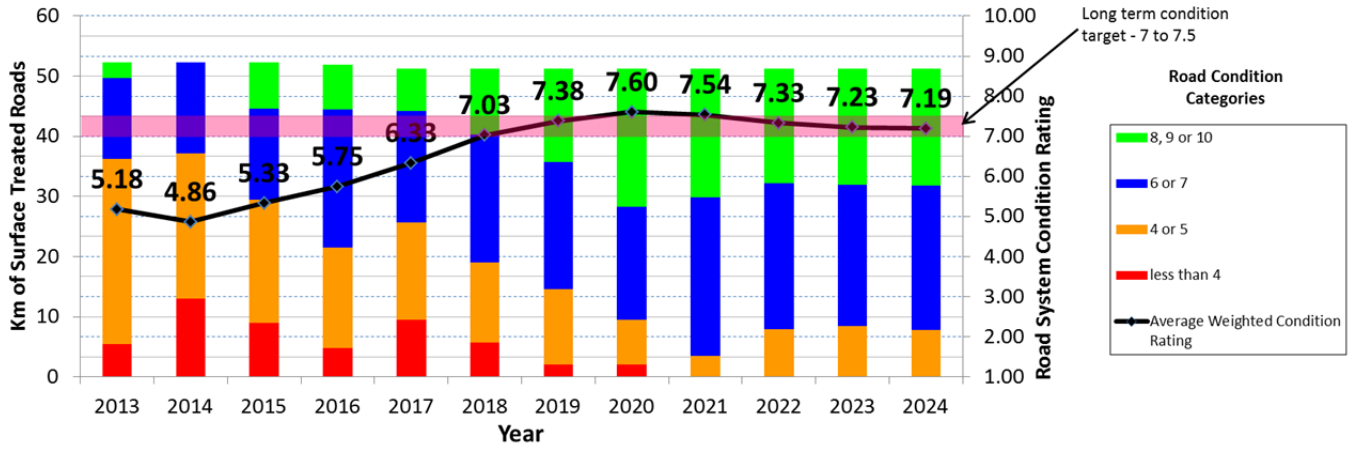
Scenario 4: Spending and Road System Condition Projections 2014-2024



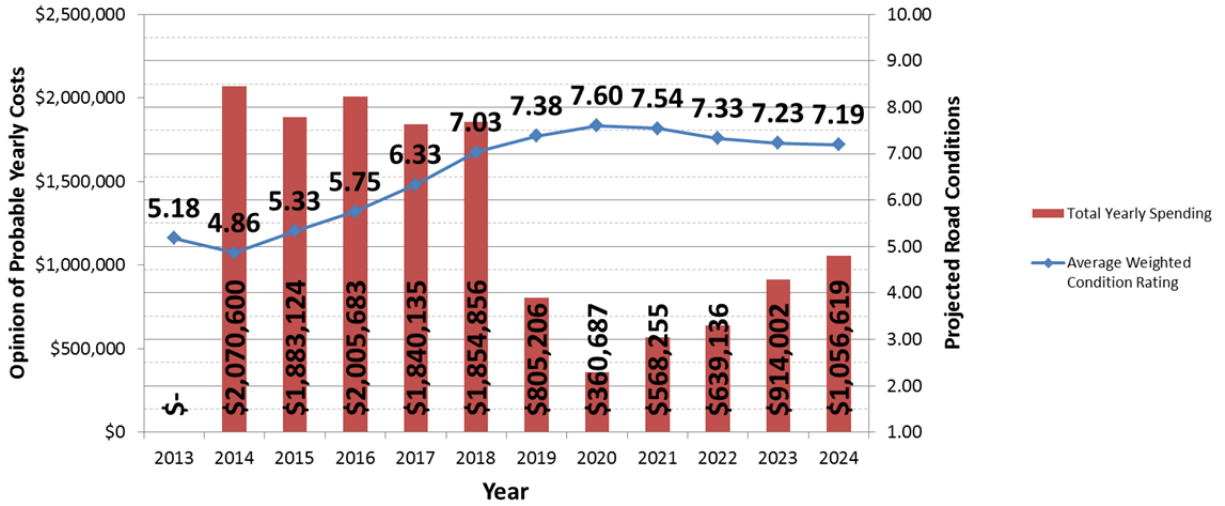
Scenario 4: DST Letterkenny - RNS other Roads

2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R096	River Road (Commercial uses)	2.492	HCB	4	Realignment (scheduled)reconstruct 300m resurface 12 in B, scarify 6 in A, DST on top,	RURAL	50000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	100000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	330000
R112	Trout Lake (Quarry Road)	0.6	HCB	4	Replace with same	RURAL	100000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	330000
R069D	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	330000
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069E	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R087	Oscar Boehme	0.8	LCB	6	RURAL LCB REHAB	RURAL	120000
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	330000
R106	Schroeder	0.7	HCB	4	Pick up pavement, mulch pavement, add 300B/150A	RURAL	44000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R002	Addington (Dump Road)	4.3	LCB	7	SST 100% 2013 dead end to Log View 2.1km 3.3 2014 1.6km	RURAL	250000
R014	Cedar Grove	0.9	LCB	7	Scarify, 150A, DST	RURAL	135000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	Resurface Rural HCB Road	RURAL	140000
R011	Burnt Bridge	0.8	LCB	8	RURAL LCB REHAB	RURAL	120000
R082	Moccasin Lake	1.3	LCB	5	0.5km SST Scarify, 300B, 150A, DST 0.5km	RURAL	85000
R066	Keller	3.2	LCB	7	SST cap layer (2016)	RURAL	65000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R019	Cormac	0.5	LCB	7	single coat SST (cap)	RURAL	10000
R092	Raglan White Lake	0.4	HCB	7	RURAL HCB REHAB	RURAL	75000
R010	Burnt Bridge	1.7	LCB	8	RURAL LCB REHAB	RURAL	255000
R081	Mantifel (3 homes)	0.135	HCB	7	RURAL HCB REHAB	RURAL	25000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
R077	Lower Rosenthal	0.8	LCB	7	RURAL LCB REHAB	RURAL	120000
R109	Soble	0.173	HCB	8	RURAL HCB REHAB	RURAL	20000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	470000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	148400

Scenario 5: Road Needs Study - BLR Road Conditions

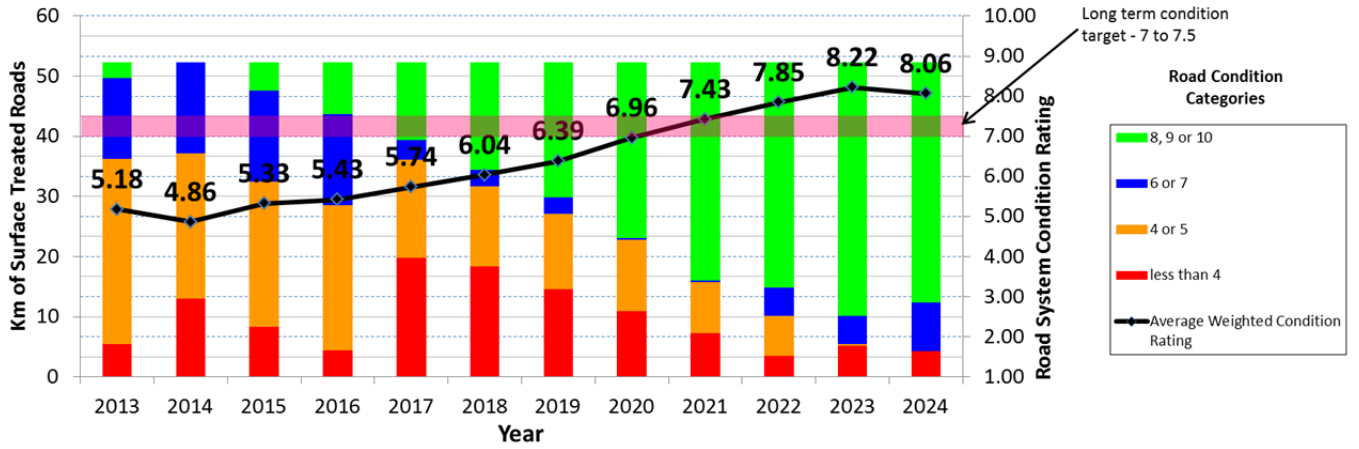


Scenario 5: Spending and Road System Condition Projections 2014-2024

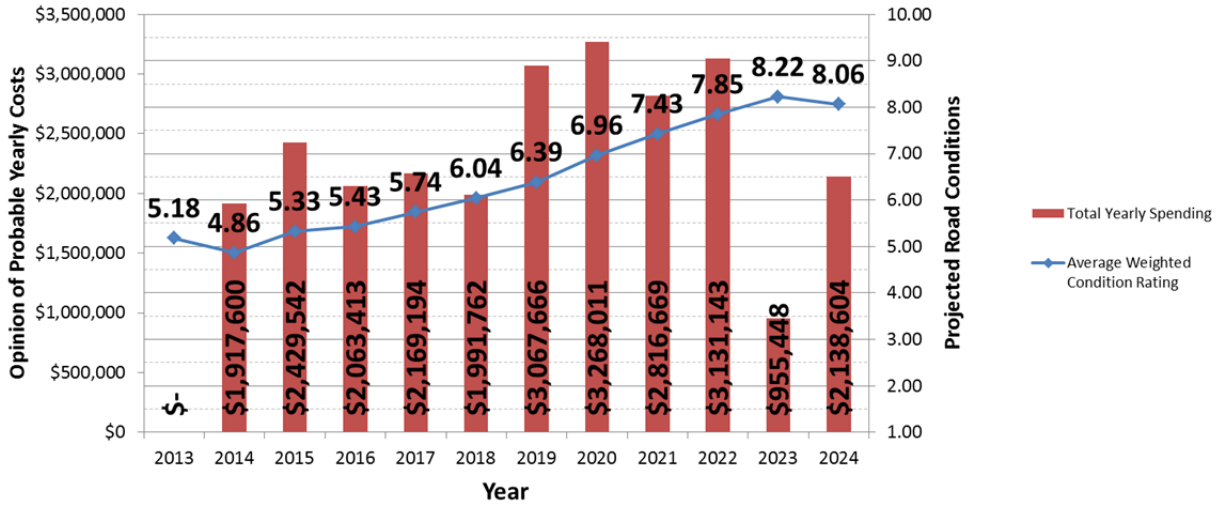


Scenario 5: Roads Needs Study							
2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	\$ 100,000
R096	River Road (Commercial uses)	2.492	LCB	4	Realignment (scheduled)reconstruct 300m resurface 12 in B, scarify 6 in A, DST on top,	RURAL	\$ 50,000
R112	Trout Lake (Quarry Road)	0.6	LCB	4	Replace with same	RURAL	\$ 100,000
R069B	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R119	Wingle	3.361	LCB	4	Scarify, 300B, 150A, DST again	RURAL	\$ 330,000
R069C	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069D	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
R008	Bruceston	3.5	LCB	5	Resurface Rural HCB Road	RURAL	\$ 140,000
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069E	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
R087	Oscar Boehme	0.8	LCB	6	RURAL LCB REHAB	RURAL	\$ 120,000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R002	Addington (Dump Road)	4.3	LCB	7	SST 100% 2013 dead end to Log View 2.1km 3:3 2014 1.6km	RURAL	\$ 250,000
R099	River Bend Drive	2.3	LCB	7	RURAL LCB REAHB	RURAL	\$ 330,000
R014	Cedar Grove	0.9	LCB	7	Scarify, 150A, DST	RURAL	\$ 135,000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R011	Burnt Bridge	0.8	LCB	8	RURAL LCB REHAB	RURAL	\$ 120,000
R106	Schroeder	0.7	LCB	4	Pick up pavement, mulch pavement, add 300B/150A	RURAL	\$ 44,000
R082	Moccasin Lake	1.3	LCB	5	0.5km SST Scarify, 300B, 150A, DST 0.5km	RURAL	\$ 85,000
R066	Keller	3.2	LCB	7	SST cap layer (2016)	RURAL	\$ 65,000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R077	Lower Rosenthal	0.8	LCB	7	RURAL LCB REHAB	RURAL	\$ 120,000
R019	Cormac	0.5	LCB	7	single coat SST (cap)	RURAL	\$ 10,000
R092	Raglan White Lake	0.4	LCB	7	RURAL HCB REHAB	RURAL	\$ 75,000
R010	Burnt Bridge	1.7	LCB	8	RURAL LCB REHAB	RURAL	\$ 255,000
R081	Mantifel (3 homes)	0.135	LCB	7	RURAL HCB REHAB	RURAL	\$ 25,000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
R109	Soble	0.173	LCB	8	RURAL HCB REHAB	RURAL	\$ 20,000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4	LCB	3	Pulverize, 300B, 150A, DST 4.0km	RURAL	\$ 470,000
R072	Little Ireland	0.7	LCB	3	Scarify, 150A, DST	RURAL	\$ 100,000
R069A	Letterkenny	3.71	LCB	5	Reconstruct 2km base and surface, pulverize 300B 150A + DST, 2 culverts Reconstruct RURAL LCB ROAD	RURAL	\$ 1,560,000

Scenario 6: Unlimited Funding - BLR Road Conditions



Scenario 6: Spending and Road System Condition Projections 2014-2024



Scenario 6: Unlimited Funding

2014							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R015	Cedar Grove	4.0	LCB	3	RECONSTRUCT	RURAL	\$ 1,600,000
R072	Little Ireland	0.7	LCB	3	RECONSTRUCT	RURAL	\$ 280,000
2015							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R048	Helferty	0.7	HCB	3	RECONSTRUCT	RURAL	\$ 420,000
R106	Schroeder	0.7	HCB	4	RECONSTRUCT	RURAL	\$ 420,000
R096	River Road (Commercial uses)	2.492	HCB	4	RECONSTRUCT	RURAL	\$ 1,495,200
2016							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R112	Trout Lake (Quarry Road)	0.6	HCB	4	RECONSTRUCT	RURAL	\$ 360,000
R119	Wingle	3.361	LCB	4	RECONSTRUCT	RURAL	\$ 1,344,400
R049	Homestead (Old Hwy)	0.4	HCB	4	RECONSTRUCT	RURAL	\$ 240,000
2017							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R082	Moccasin Lake	1.3	LCB	5	RECONSTRUCT	RURAL	\$ 520,000
R069A	Letterkenny	3.71	LCB	5	RECONSTRUCT	RURAL	\$ 1,484,000
2018							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069B	Letterkenny	3.71	LCB	5	RECONSTRUCT	RURAL	\$ 1,484,000
R087	Oscar Boehme	0.8	LCB	6	RECONSTRUCT	RURAL	\$ 320,000
2019							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069C	Letterkenny	3.71	LCB	5	RECONSTRUCT	RURAL	\$ 1,484,000
R077	Lower Rosenthal	0.8	LCB	7	RECONSTRUCT	RURAL	\$ 320,000
R099	River Bend Drive	2.3	LCB	7	RECONSTRUCT	RURAL	\$ 920,000
2020							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069D	Letterkenny	3.71	LCB	5	RECONSTRUCT	RURAL	\$ 1,484,000
R066	Keller	3.2	LCB	7	RECONSTRUCT	RURAL	\$ 1,280,000
R081	Mantifel (3 homes)	0.135	HCB	7	RECONSTRUCT	RURAL	\$ 81,000
2021							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R069E	Letterkenny	3.71	LCB	5	RECONSTRUCT	RURAL	\$ 1,484,000
R092	Raglan White Lake	0.4	HCB	7	RECONSTRUCT	RURAL	\$ 240,000
R010	Burnt Bridge	1.7	LCB	8	RECONSTRUCT	RURAL	\$ 680,000
2022							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R008	Bruceton	3.5	HCB	5	RECONSTRUCT	RURAL	\$ 2,100,000
R019	Cormac	0.5	LCB	7	RECONSTRUCT	RURAL	\$ 200,000
R011	Burnt Bridge	0.8	LCB	8	RECONSTRUCT	RURAL	\$ 320,000
2023							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R087	Oscar Boehme	0.8	LCB	6	RECONSTRUCT	RURAL	\$ 320,000
R014	Cedar Grove	0.9	LCB	7	RECONSTRUCT	RURAL	\$ 360,000
R109	Soble	0.173	HCB	8	RECONSTRUCT	RURAL	\$ 103,800
2024							
Road ID	Road Name	Road Length (km)	Road Surface	2013 Road Condition	Activity	Road Type	Cost
R002	Addington (Dump Road)	4.3	LCB	7	RECONSTRUCT	RURAL	\$ 1,720,000

Appendix D – Supplementary Information