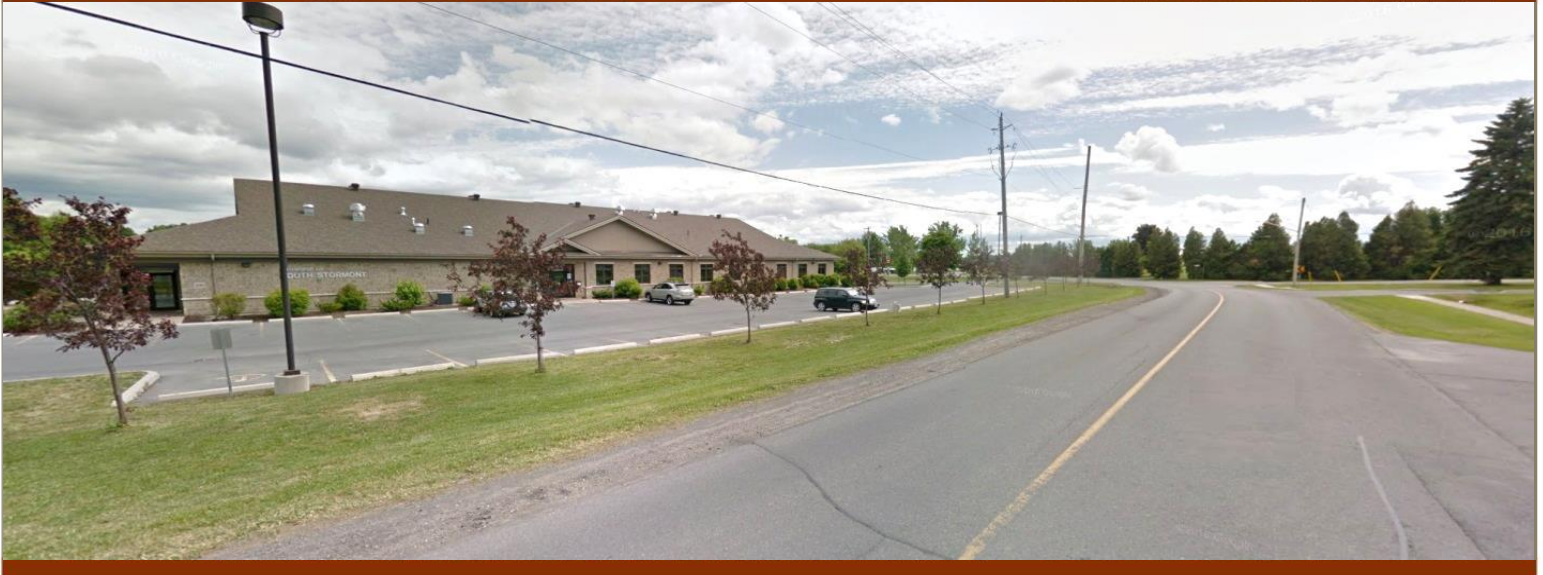


**McINTOSH  
PERRY**



## *The Township of South Stormont* **2017 Roads Needs Study**

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## 1.0 INTRODUCTION

It has become apparent to Council and Township staff that available information on the road system presented in the 2011 Asset Management Plan needs to be updated in order to make informed decisions on improvements to the Township's infrastructure. The Township recognizes that in order to sustain services for its residents and for the competitiveness of its business, agriculture and industry, it must manage the Municipality's assets cost effectively. The Road Needs Study provides Council and staff with an inventory of all roads, a comprehensive review of existing conditions and a plan to repair and maintain the road network to a satisfactory level of service.

The purpose of the Road Needs Study is to present an up to date inventory and assessment of the road network within the Municipality from which a financial program for the maintenance and capital improvements can be derived. The study will provide the Municipality with a suggested capital program in order to manage the road network over the next 10 years.

The Road Needs Study will:

- Inform council on the current and future needs of their road system,
- Formulate the most cost-effective long-term maintenance and construction strategies within current/proposed budgetary limitations,
- Provide a projection of the future adequacy of the road system,
- Provide a suggested year-by-year work plan for Council (over the next 10 years), and
- Update the Township's Municipal Asset Management Plan.

The Study contains the following:

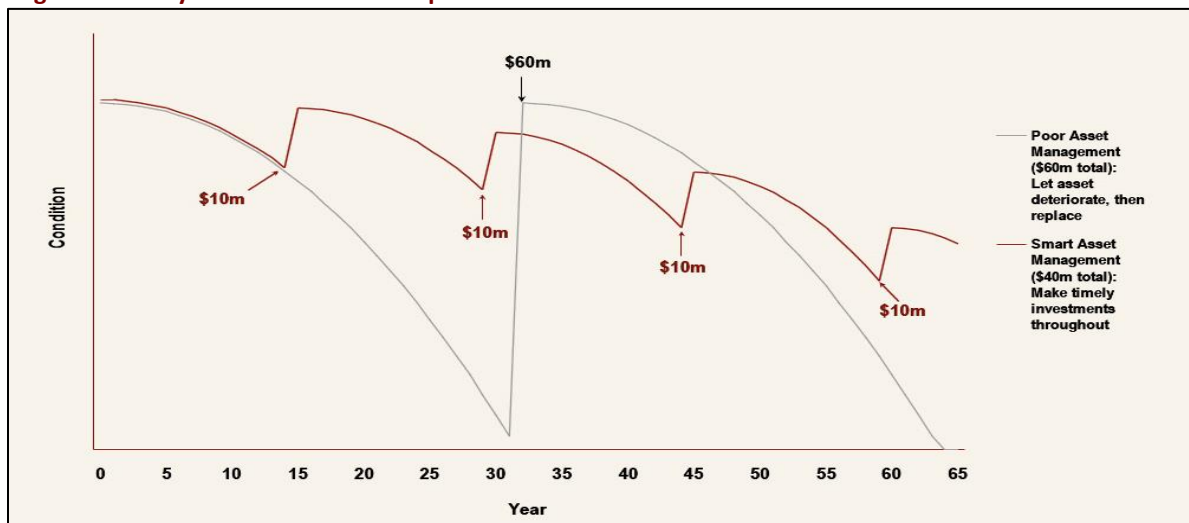
- An updated inventory of the Municipality's road network,
- Itemized condition of all roadways in the network,
- Detailed recommendations on improvements to deficient roadways,
- A cost-effective long-term maintenance and construction strategy with specific consideration of budgetary restrictions,
- Complete up-to-date maps of the Township's roadway system for future reference,
- A suggested year-by-year work plan for the Township to use as a frame of reference for future resource allocation,
- Recommended 10-year capital improvement plan using current/proposed expenditure levels, and
- Capital construction requirements that cannot be realized within the current budget.

Some of the major benefits of conducting a Road Needs Study are:

- A. Systematic Approach
  - Roads prioritized based on needs.
  - Limited resources allocated to cost-effective projects.
  - Council can justify why a road was or was not selected for improvements.
- B. Long Term Strategy
  - Tax dollars will be spent strategically.
  - 10-year plan spans between terms of Council.
  - Saves Council staff time in formulating program each year.
- C. Benchmark
  - Can project future adequacy of the road system.
  - Can compare with other Municipalities.
  - Justification for tax increase and/or shifting priorities to address spending shortfalls.

This Road Needs Study has been developed with an emphasis on timely capital repairs in order to best preserve assets while maintaining the desired level of service to the public. The plan takes a long view perspective on managing assets through life cycle cost analysis in which timely rehabilitation can save money in the long term. For example, Figure 1 shows two ways to manage an asset. The first option is to allow the asset to deteriorate until it needs to be replaced, while the second option shows timely rehabilitation. At the end of the 64-year life cycle, Option 1 costs \$120 million (the initial investment plus the cost to replace the asset) and Option 2 costs \$100 million (the initial investment plus maintenance costs). Note that the asset’s condition in Option 2 is far better than in Option 1.

**Figure 1: Life Cycle of Two Renewal Options**



(Resource from “Building Together, Guide for Municipal Asset Management Plans”, Ministry of Infrastructure, Ontario)

## 2.0 STUDY METHODOLOGY

The Ministry of Transportation of Ontario “Inventory Manual for Municipal Roads for Small Lower Tier Municipalities” has been used in preparing this study and is briefly outlined below:

1. All road sections are listed and their condition rating by road type:
  - a. Earth Roads (Listed in inventory but not rated. Typically, these roads have little or no maintenance, only used seasonally),
  - b. Gravel Roads,
  - c. Surface Treated or Low Class Bituminous (LCB) Roads,
  - d. Hot Mix Paved or High Class Bituminous (HCB) Roads.
2. With the exception of Earth Roads, future condition ratings are calculated for each road and from this, predicted maintenance and capital expenditures can be produced. Newly reconstructed roads have a 10 point condition rating, and roads requiring partial reconstruction are assigned three points. Roads should not be allowed to go below three points due to the severity of the road conditions, e.g. very poor ride, difficult to maintain, usually a safety hazard.

Generally speaking, the Township of South Stormont roads have low traffic volumes, which are consistent throughout its road network. It has been assumed that asphalt roads will need to be resurfaced within 15 years and if not resurfaced, then reconstructed in 30 years. Note that one cannot perpetually resurface and at some point the road must be reconstructed. It has been assumed that a surface treated road has a life expectancy of approximately 15 years before reconstruction is required.

*The above noted life cycle assumptions should not have a great impact on the overall assessment of the road network, but some roads may experience slower or faster rates of deterioration. The capital program may need to be adjusted (e.g. A street scheduled for reconstruction in year 10 may have to be moved up in the ten year capital program and vice versa, a street scheduled for year 3 could be pushed back since its condition has not deteriorated as fast as earlier predicted) to account for this and other factors such as variations in pavement structure, sub-surface conditions, drainage, and truck traffic.*

Through regularly measuring the performance of its road system (e.g. Road Needs Study every 5 years, ongoing traffic counts, etc.), the Municipality will be able to better predict the deterioration rates of individual segments and therefore the overall network.

The condition rating for each road type will decrease every year unless maintenance and/or rehabilitation are performed. For gravel roads it is assumed that the condition of the road will be maintained with regular gravel resurfacing. As noted above, hard surface roads with no maintenance and/or rehabilitation (which is not recommended) will need reconstruction within 15 years for surface treated roads and approximately 30 years (depending on AADT) for asphalt roads. The following calculations show the anticipated rate of deterioration of the three surface types:

**Asphalt:** 
$$\frac{10 \text{ point condition rating} - 3 \text{ point condition rating}}{30 \text{ year life cycle before reconstructing}} = 0.23/\text{yr}$$

**Surface Treatment:** 
$$\frac{10 \text{ point condition rating} - 3 \text{ point condition rating}}{15 \text{ year life cycle before reconstructing}} = 0.47/\text{yr}$$

**Gravel:** No change in rating with regular maintenance.

Based on the foregoing discussion, Table 1 provides an example of how the condition rating is forecasted for each surface type. In this example, it is assumed that for each road type the road was reconstructed in 2016.

**TABLE 1 - FORECASTING CONDITION RATING EXAMPLE**

SURFACE TYPE	2016	2017	2018	2019	2020	2021
GRAVEL <sup>1</sup>	10.00	10.00	10.00	10.00	10.00	10.00
SURFACE TREATMENT	10.00	9.53	9.07	8.60	8.13	7.67
ASPHALT (AADT<600)	10.00	9.77	9.53	9.30	9.07	8.83

<sup>1</sup> Gravel Roads have a stable unchanging life expectancy, as long as routine loose top maintenance is performed. Gravel roads will remain this way until improvements are made.

- The average condition rating is determined for each road type by summing the product of length multiplied by the condition rating and then dividing by the total length of the road system. This will result in an average condition rating for the three road surface types. An example is demonstrated in Table 2, below:

**TABLE 2 - AVERAGE CONDITION RATING BY SURFACE TYPE EXAMPLE**

STREET	LENGTH (L)	CONDITION RATING (CR)	PRODUCT L x CR
1	1.00	7.00	7.00
2	2.00	3.00	6.00
3	3.00	5.00	15.00
<b>TOTAL</b>	<b>6.00</b>		<b>28.00</b>

Where: Average Condition Rating =  $\frac{\text{SUM}(L \times \text{CR})}{\text{Total Length}} = \frac{28.00}{6.00} = 4.67$

By combining the three surface types an overall condition rating can be calculated for the total Municipal system. Table 3 is a measure of the condition of the road system.

**TABLE 3 – SYSTEM CONDITION**

AVERAGE CONDITION RATING	SYSTEM CONDITION
8 to 10	Good structural condition.
	Some local improvements may be needed.
5 to 7	Average structural condition.
	Some continued improvement may be needed.
Less than 5	Poor structural condition.
	Substantial improvement needed throughout total road system.

4. The above noted analysis will determine if and when a road requires improvements within the next ten years.
5. In developing the priority of road improvements, the first consideration for the available funds is for asphalt resurfacing projects, i.e. those road sections with a study year condition rating of 5. This will upgrade those roads at a reasonable cost that if not improved, will continue to deteriorate to a point where only major and costly improvements will restore the structural strength of the road.

If funds are available after addressing the needs of the roads with a condition rating of 5, they should be applied to the road improvements that would provide the best cost/benefit return. The method used in this study reviews the cost of reconstruction versus the Average Annual Daily Traffic (AADT).

As an example, if one street is a Dead End and one street is a minor collector, and both cost the same per kilometer to reconstruct, then the minor collector would be selected over the dead end, since it serves more commuters.

6. To determine the cost of construction, benchmark costs are used and are associated with the type of capital improvement. Average unit costs have been developed based on local construction costs.

Fixed costs are costs associated with maintenance of the existing road system and include overhead, salaries, etc. Fixed costs are generally met from the Township’s budget prior to capital construction funds being allocated. Fixed costs for forecast requirements were derived from historical expenditures.

This report presents historical information with no adjustment for inflation. For future capital expenditures, the report presents cost estimates in 2016 dollars. At the time of budgeting, the Municipality should adjust capital expenditure by an appropriate cost of inflation.

7. The ten year capital program presented in this report is a tool for Municipal Staff and Council in selecting the ten year program. As mentioned above, there may be other factors that must be considered and/or adjusted in order to reflect changes not foreseen at the time of writing this report.

### 3.0 ROAD STANDARDS

Most municipalities in Ontario either adopt or utilize the following manuals in developing their design and construction standards:

- Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads,
- Ontario Provincial Standards (OPS) for Roads and Municipal Services,
- Ontario Traffic Manual, and
- Ministry of Transportation of Ontario, Drainage Management Manual.

Ministry of Transportation of Ontario's Directive B-36, October 1985, applied to municipalities that were applying for subsidies. This directive no longer applies, but its brief format is easy to use and is summarized on the following page. It is McIntosh Perry's recommendation that these standards be followed.

**TABLE 4 – GEOMETRIC DESIGN STANDARDS FOR RURAL TWO-LANE ROADS**

DESIGN YEAR AADT	DESIGN SPEED (Km/hr)	MAX. GRADE (%)	WIDTH (m)	
			LANE	SHOULDER <sup>3</sup>
2,000 to 1,000	90	6-8	3.25	2.00
	80	6-8	3.25	2.00
	70	6-12	3.00	1.00
	60	6-12	3.00	1.00
1,000 to 400	80	8	3.25 <sup>1</sup>	1.00 <sup>2</sup>
	70	12	3.00	1.00 <sup>2</sup>
	60	12	3.00	1.00 <sup>2</sup>
	50	12	3.00	1.00 <sup>2</sup>
Less than 400	80	8	3.25 <sup>1</sup>	1.00 <sup>2</sup>
	70	12	3.00	1.00 <sup>2</sup>
	60	12	3.00	1.00 <sup>2</sup>
	50	12	2.75	1.00 <sup>2</sup>

<sup>1</sup> A 3.0m lane width may be acceptable where type size and volume of trucks are not significant.

<sup>2</sup> 0.5m shoulders permitted where there is no foreseeable possibility of the road being paved within a 20-year period. Note: 1.0m shoulder must be used where guide rail is installed.

<sup>3</sup> Shoulder width may be reduced by 0.5m if paved. Shoulder width does not incl. rounding (0.5m).



**TABLE 5 – ALIGNMENT STANDARDS**

DESIGN SPEED	MINIMUM <sup>1</sup> CURVE RADIUS	MINIMUM STOPPING DISTANCE	MINIMUM <sup>2</sup> CREST CURVE	MINIMUM <sup>2</sup> SAG CURVE	MINIMUM <sup>3</sup> SAG CURVE ILLUMINATED AREAS
(Km/hr)	(m)	(m)	K (m)	K (m)	K (m)
40	55	45	4	8	4
50	90	65	8	12	5
60	130	85	15	18	8
70	190	110	25	25	12
80	250	135	35	30	15
90	340	160	50	40	20

<sup>1</sup> Minimum curve radius based on maximum super elevation of 0.06 m/m.

<sup>2</sup> Minimum curve parameter based on stopping distance.

<sup>3</sup> Minimum curve parameter based on comfort criteria. Utilize in illuminated areas only when stopping sight distance requirements are met.

**TABLE 6 – GEOMETRIC DESIGN STANDARDS FOR TWO-LANE URBAN ROADS**

DESIGN YEAR TRAFFIC	DESIGN SPEED	LANE WIDTH	PARKING LANE WIDTH	MIN. CURB TO CURB DISTANCE	MAXIMUM GRADE
AADT	(Km/hr)	(m)	(m)	(m)	(%)
2,000 to 1,000	60-70	3.25	2.50 - 3.00	9.5	6 - 12
	50	3.00	2.50 - 3.00	9.0	8 - 12
Less than 1,000	40-50	2.75 - 3.00	2.50 - 3.00	8.5	8 - 12

Note: The desirable minimum sidewalk width is 1.5m.

Table 7 shows the recommended surface type based on AADT.

**TABLE 7 – SURFACE TYPE STANDARDS FOR RURAL ROADS**

AADT AT TIME OF CONSTRUCTION	SURFACE TYPE <sup>1</sup>
0 - 400	Gravel
400 - 700	Low Class Bituminous <sup>2</sup>
700 - 2,000	For Lower Volumes in Range: 40mm of Hot Mix <sup>3</sup>
	For Higher Volumes in Range: 50mm of Hot Mix

<sup>1</sup> The grade upon which the surface type is to be applied is assumed to be structurally adequate. Typically, the base is 150mm Granular 'A' and 300mm Granular 'B', Type II.

<sup>2</sup> Apply surface treatment 0.25m wider than lane width, e.g. for 3.0m lane width, apply 3.25m wide.

<sup>3</sup> It has been McIntosh Perry's experience that Hot Mix should be used instead of surface treatment if (1) there is abnormally high percentage of truck traffic or heavy farm equipment, and/or (2) there is closely spaced residential that is set-back less than 30m from the road, e.g. villages and rural estate subdivisions. It has been McIntosh Perry's experience that increasing this to 50mm is cost effective in the long term.

Table 8 lists other criteria that should be reviewed when selecting road surface type. Urban roads are typically constructed as asphalt roads; however rural roads have various options depending on a number of factors. These factors have been summarized in the following table.

**TABLE 8 – SUITABILITY OF SURFACE TYPE FOR RURAL ROADS**

PARAMETER	GRAVEL	SURFACE TREATMENT	ASPHALT
<b>AADT</b>			
0 - 400	X	X	X
400 - 1,000		X	X
1,000 - 2,000			X
Above 2,000			X
<b>TRUCK TRAFFIC</b>			
0 - 5%	X	X	X
5 - 15%		X	X
Above 15%			X
<b>HIGHWAY CLASSIFICATION</b>			
Local	X	X	X
Collector			X
Arterial			X
<b>ADJACENT LAND USES</b>			
Agricultural	X		X
Commercial			X
Forestry	X	X	X
Industrial			X
Institutional			X
<b>Residential</b>			
5+ Acre Lots	X	X	X
<b>Cluster Development of 2 - 5 Acre Lots</b>			
Front Yard Set Back 15m of less			X
Front Yard Set Back 15m of more		X	X
2 Acre Lot Subdivisions			X

## 4.0 BENCHMARK COSTS

Benchmark costs are costs associated with capital improvements to the Township's roads. These costs can also be for new road construction or capital expenditure to improve a road to a higher standard. For example, upgrading a gravel road to a surface treated or paved road. Average unit costs have been developed based on local construction costs.

The estimated cost for identified improvements to the Township's road system is calculated on an approximate basis, using average benchmark costs for various items. These costs have been averaged using unit cost information obtained locally. Unit prices are shown in Table 9 below and costs are summarized by construction type in Tables 10, 11 and 12. These costs are based on 2016 dollars and adjustments should be made for inflation for each budget year.

**TABLE 9 – UNIT PRICES**

ITEM	2016 unit price	
Earth Excavation, Grading	\$13.91	per cubic metre
Earth Excavation, Ditching	\$20.00	per metre
Road Widening per Shoulder	\$22.00	per metre
Removal – Pulverize	\$1.90	per square metre
Removal – Asphalt	\$4.00	per square metre
Removal – Mill Wear Course	\$20.00	per square metre
Removal – Concrete Curb	\$6.00	per metre
Removal – Concrete Sidewalk	\$12.50	per square metre
Remove and Replace 16m x 600mm Diameter CSP	\$4,000.00	each
Granular A	\$10.40	per tonne
Granular B	\$8.90	per tonne
Single Surface Treatment (SST)	\$2.70	per square metre
Double Surface Treatment (DST)	\$5.30	per square metre
Asphalt – Wear Course	\$115.00	per tonne
Asphalt – Base Course	\$105.00	per tonne
Tack Coat	\$1.45	per square metre
Iron Adjustment	\$695.56	each
Concrete Sidewalk	\$65.00	per square metre
Concrete Barrier Curb	\$55.00	per metre
Topsoil & Sod	\$12.00	per square metre
Topsoil & Seed	\$6.00	per square metre
Rout & Seal	\$2.90	per metre
Rejuvenating Oil	\$1.74	per square metre

Benchmark costs for typical types of reconstruction for hard surface roads (resurfacing, partial reconstruction and full depth reconstruction) are summarized by in Tables 10 and 11. Full depth reconstruction includes an allowance for geotechnical investigation and testing as well as for engineering design and construction supervision. In some instances, the Municipality may also use a professional engineer for resurfacing and/or partial reconstruction due to the complexity of the project and/or workload. These costs are based on 2016 dollars and adjustments should be made for inflation for each budget year.

TABLE 10 – SURFACE TREATMENT OR LOW COST BITUMINOUS (LCB)

CODE	DESCRIPTION	UNIT PRICE (\$ per km)
<b>LCB-R1</b>	<b>Resurfacing</b> Single surface treatment 6.0m wide	\$20,000
<b>LCB-R2</b>	<b>Partial Depth Reconstruction</b> Pulverize or scarify, 50-150mm G.A., double surface treatment, 10% spot drainage improvements, culvert replacement & 10% contingency	\$110,000
<b>LCB-R3</b>	<b>Full Depth Reconstruction</b> Earth exc., 150mm G.A., 300mm G.B., DST, culvert replacement, engineering, geotechnical & 10% contingency	\$382,000

TABLE 11 – ASPHALT OR HIGH COST BITUMINOUS (HCB) RURAL ROADS

CODE	DESCRIPTION	UNIT PRICE (\$ per km)
<b>HCB-R1</b>	<b>Resurfacing</b> 40mm lift of HL3 asphalt over 6.0m platform width & 10% contingency	\$78,000
<b>HCB-R2</b>	<b>Pulverize and Pave</b> Pulverize, 50mm lift of HL4 asphalt, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	\$158,000
<b>HCB-R3</b>	<b>Full Depth Reconstruction</b> Remove asphalt, earth exc., 150mm G.A., 450mm G.B., 50mm Lift of HL4 asphalt, shouldering, culvert replacement, engineering, geotechnical & 10% contingency	\$487,000
<b>HCB-R4</b>	<b>Rout and Seal</b> Routing of Cracks	\$5,000
<b>HCB-R6</b>	<b>Rejuvenating Oil</b> Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio	\$12,000

TABLE 12 – ASPHALT OR HIGH COST BITUMINOUS (HCB) SEMI-URBAN ROADS

CODE	DESCRIPTION	UNIT PRICE (\$ per km)
<b>HCBS1</b>	<b>Resurfacing</b> 40mm lift of HL3 asphalt over 6.0m platform width & 10% contingency	\$92,000
<b>HCBS2</b>	<b>Pulverize and Pave</b> Pulverize, 50mm lift of HL4 asphalt, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	\$221,000
<b>HCBS3</b>	<b>Full Depth Reconstruction</b> Remove asphalt, earth exc., 150mm G.A., 50mm Lift of HL4 asphalt, shouldering, adjust iron, tie-in driveways, road culvert replacement, 10% spot drainage & 10% contingency	\$737,000
<b>HCBS4</b>	<b>Rout and Seal</b> Routing of Cracks	\$5,000
<b>HCBS6</b>	<b>Rejuvenating Oil</b> Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio	\$12,000

TABLE 13 – ASPHALT OR HIGH COST BITUMINOUS (HCB) URBAN ROADS

CODE	DESCRIPTION	UNIT PRICE (\$ per km)
<b>HCBU1</b>	<b>Resurfacing</b> 40mm Lift of HL3 asphalt by 8.5m wide, adjust iron, milling & 10% contingency	\$318,000
<b>HCBU2</b>	<b>Partial Depth Reconstruction</b> Remove asphalt, 10% curb and sidewalk repairs, earth exc., 150mm G.A., 40mm lift of HL3 and 40mm lift of HL4 asphalt, adjust iron & 10% contingency	\$360,000
<b>HCBU3</b>	<b>Full Depth Reconstruction</b> Remove asphalt, curbs and sidewalk, earth exc., 150mm G.A., 300mm G.B., 2 lifts of asphalt, adjust iron, curbs, sidewalk, tie-in driveways and lawns, geotechnical, engineering & 10% contingency	\$915,000
<b>HCBU4</b>	<b>Rout and Seal</b> Routing of Cracks	\$5,000
<b>HCBU6</b>	<b>Rejuvenating Oil</b> Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio	\$12,000

## 5.0 PAVEMENT PRESERVATION

In order to optimize the lifecycle of asphalt roads in the municipal road network, it is recommended that the operational budget include maintenance tasks. Implementation of pavement preservation activities will maintain the road condition at higher service levels and also reduce the long-term costs to sustain the infrastructure. Two maintenance strategies are proposed for the capital plan, specifically (1) Rout and Seal, and (2) Rejuvenating Oil. These strategies are further described below.

### 5.1 Rout and Seal

Rout and seal involves routing of cracks to a standard size, cleaning and heating of routed cracks with a lance, followed by hot poured rubberized asphalt including squeegee. By keeping the water out, it prohibits freeze/thaw reactions in winter, and guards against reduced strength due to water infiltration at other times, thus suspending the development of alligator cracks. Routing and sealing is not normally used in single lift pavements over granular, as routing can promote full depth cracking.

Routing and sealing is typically recommended in earlier portions of a pavement's lifecycle, with cracks less than 12mm in width and with less than 1,500 linear meters of cracks per kilometre of pavement, and can increase the life of an asphalt road by 3+ years. At a cost of \$2.50 - \$3.00 per linear metre, crack sealing represents a cost effective solution to pavement preservation.

### 5.2 Rejuvenating Oil

Rejuvenating oil penetrates the asphalt surface and restores the maltene to asphalt ratio by replacing oils in the asphalt that are lost over as asphalt ages and oxidizes. Rejuvenating oil improves the condition of asphalt and temporarily reverses the aging process by increasing pavement flexibility and preventing the surface from drying out. This increased flexibility also reduces the development and propagation of cracks.

Rejuvenating oil application is typically recommended around the seven to 10 year mark of a pavement's life cycle, and can increase the life of an asphalt road by 3+ years. At a cost of approximately \$1.75 per square metre, rejuvenating oil represents another cost effective solution to pavement preservation.

## 6.0 CONDITION OF EXISTING ROAD SYSTEM

This section details the existing conditions of the municipal road network and provides a comparison to past condition ratings. Table 14 presents the length and weighted average condition ratings for Gravel Roads, Low Class Bituminous (LCB, surface treated) and High Class Bituminous (HCB, asphalt) roads based on 2016 condition assessments compared to past condition ratings from 2011.

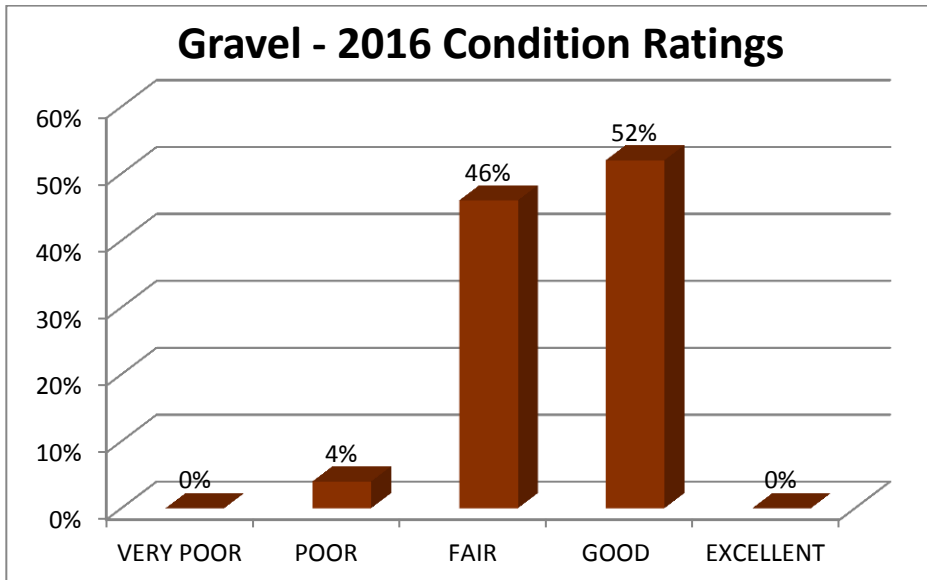
**TABLE 14 – 2011 & 2016 WEIGHTED AVERAGE CONDITION RATINGS**

CATEGORY	km	CONDITION RATING	
		2011	2016
GRAVEL	105.52	6.11	6.31
LOW CLASS BITUMINOUS (LCB)	78.45	5.37	6.81
HIGH CLASS BITUMINOUS (HCB)	112.35	5.96	5.65
<b>HARD SURFACE ROADS</b>	<b>190.80</b>	<b>5.72</b>	<b>6.13</b>
<b>ALL ROADS</b>	<b>296.32</b>	<b>5.86</b>	<b>6.19</b>

Approximately 105.52 km or 36% of the Township's roads are Gravel, with an overall condition rating of 6.31 in 2016 compared to 6.11 in 2011. The ideal condition rating for gravel should be between 6.0 and 7.0, therefore the condition rating of gravel roads is satisfactory. The increase in condition rating from 2011 is indicative of regular gravel maintenance and the Township's goal should be to maintain this condition rating with similar maintenance practices.

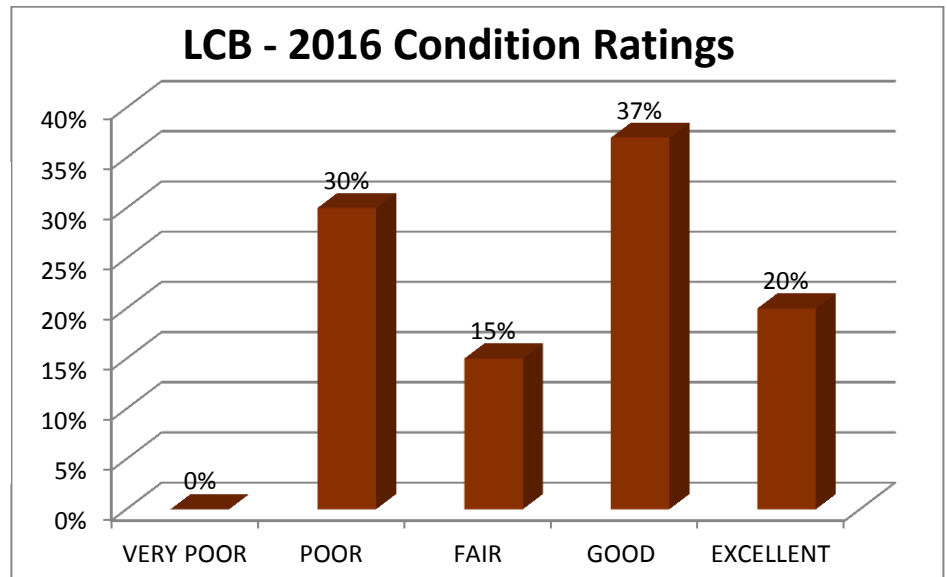
The remaining 64% of the Townships roads are hard surface roads, totalling 78.45 km and 112.35 km for Low Class Bituminous (LCB) and High Class Bituminous (HCB), respectively. The optimum overall condition rating for LCB roads based on available pavement preservation treatments and lifecycle analysis is between 6.0 and 6.5. Similarly, the optimum condition rating is between 6.5 and 7.0 for HCB roads. Based on the foregoing, a blended average condition rating for hard surface roads should be between 6.3 and 6.8. A rating below the aforementioned range is an indication that hard surface roads are underfunded and require increased maintenance. The current (2016) blended average weighted condition rating for all LCB and HCB roads in the township is 6.13. Although this represents a notable increase when compared to 5.72 in 2011, it is recommended that the township continue with efforts to increase the overall condition of hard surface roads.

The following bar charts summarize the overall percentage of roads (by length) based on their existing condition, where "Very Poor" represents a condition rating equal to or less than 2, "Poor" is a condition rating of 3-4, "Fair" is a condition rating of 5-6, "Good" is a condition rating of 7-8 and "Excellent" represents a condition rating greater than 8.

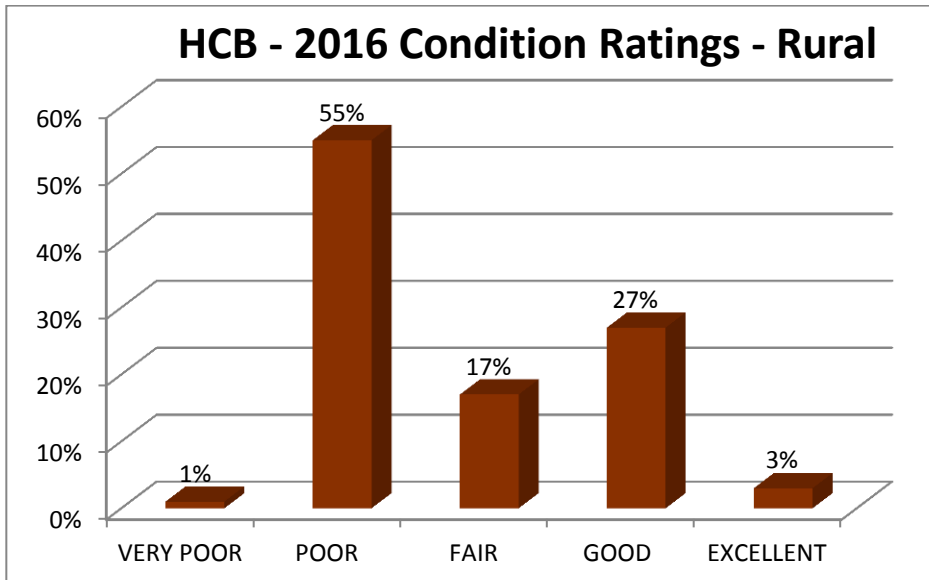


**Chart 1 (Left): Gravel Condition Rating.** 52% of loose top gravel roads have a condition rating greater than 6. This suggests the Township’s gravel roads are generally well maintained.

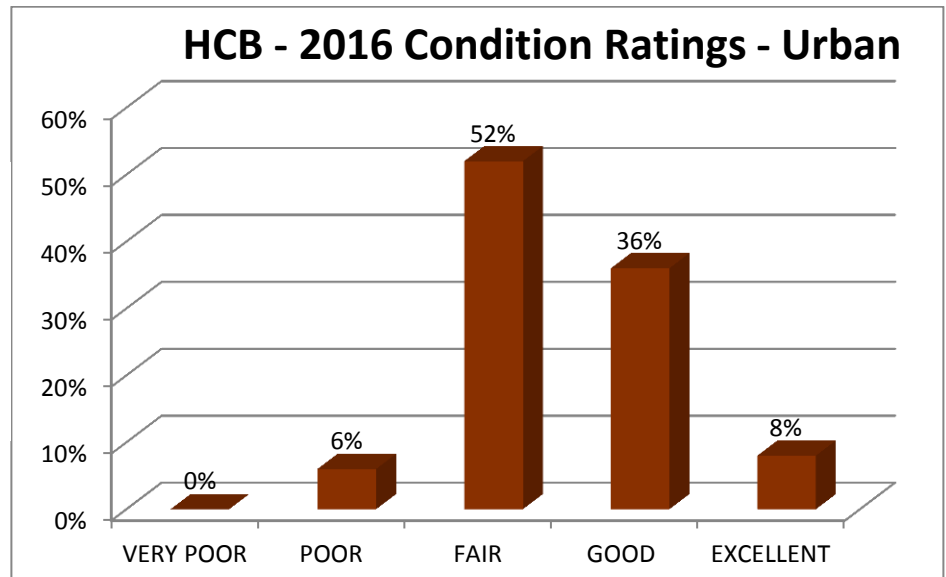
**Chart 2 (Right): LCB Condition Rating.** 72% of surface treated roads have a condition rating of 5 or greater. This suggests that the township’s LCB roads are generally well maintained.







**Chart 3 (Left): HCB Condition Rating – Rural Roads.** 73% of the township’s rural asphalt roads have a condition rating less than the desired optimum.



**Chart 4 (Right): HCB Condition Rating – Urban Roads.** 96% of the township’s urban asphalt roads have a condition rating of 5 or greater.

A complete assessment for each road segment can be found in **Appendix B**. Similarly, Map 1 provides an overview of the surface type of existing roads while Map 2 presents a visual depiction of “Now Deficient” roads (i.e. roads with a condition rating less than 5).

## 7.0 RENEWAL AND RECONSTRUCTION STRATEGY

The optimum renewal and reconstruction strategy for preserving the structure of each road type over their lifecycle is presented in Table 15.

**TABLE 15 – OPTIMUM RENEWAL AND RECONSTRUCTION STRATEGY**

SURFACE TYPE	ENVIRONMENT	LIFE-CYCLE YEAR	STRATEGY	AVERAGE CONDITION RATING	
GRAVEL	RURAL	N/A	Regular maintenance through gravel resurfacing	6.00	
LCB (Surface Treated)	RURAL	0	Construction of Asset	6.45	
		8	Single Surface Treatment Overlay		
		19	Partial Depth Reconstruction		
		25	Single Surface Treatment Overlay		
		36	Partial Depth Reconstruction		
		42	Single Surface Treatment Overlay		
		55	Full-Depth Reconstruction		
HCB (Asphalt)	RURAL / SEMI-URBAN	0	Construction of Asset	7.17	
		8	Rejuvenating Oil		
		20	Asphalt Overlay		
		24	Rout and Seal Cracks		
		28	Rejuvenating Oil		
		52	Partial Depth Reconstruction		
		60	Rejuvenating Oil		
		68	Asphalt Overlay		
		72	Rout and Seal Cracks		
		76	Rejuvenating Oil		
	100	Full Depth Reconstruction			
	URBAN	URBAN	0	Construction of Asset	7.52
			4	Rout and Seal Cracks	
			8	Rejuvenating Oil	
			24	Asphalt Overlay	
			28	Rout and Seal Cracks	
			32	Rejuvenating Oil	
			56	Partial Depth Reconstruction	
			60	Rout and Seal Cracks	
			64	Rejuvenating Oil	
75			Asphalt Overlay		
79	Rout and Seal Cracks				
83	Rejuvenating Oil				
100+	Full-Depth Reconstruction				

Based on the above-noted strategy, the ideal life-cycle for each road type has been developed and is presented in **Appendix A**.

## 7.1 Hard Surface Roads

Table 16 summarizes the average condition rating and yearly life-cycle cost over the life of the asset using the above noted preservation strategy for hard surface roads. For comparison purposes, the lifecycle costs and overall average condition rating is also presented for an approach consisting only of reconstruction of asphalt roads.

**TABLE 16 – LIFECYCLE CONDITION RATING AND COST**

TYPE	ENVIRONMENT	AVERAGE CONDITION RATING OVER ASSET LIFE	LIFECYCLE COST PER YEAR PER KM
SURFACE TREATMENT (LCB)	RURAL	6.45	\$ 12,036
ASPHALT (HCB) OPTIMUM LIFECYCLE	RURAL	7.17	\$ 8,590
	SEMI-URBAN		\$ 12,000
	URBAN	7.52	\$ 19,790
ASPHALT (HCB) RECONSTRUCTION ONLY	RURAL	6.44	\$ 9,610
	SEMI-URBAN		\$ 14,000
	URBAN		\$ 19,950

When compared to the ‘reconstruction only’ approach, lifecycle costs are substantially lower for the optimum lifecycle in which maintenance activities are given priority, while the average overall condition rating is considerably higher.

In developing the priority of road improvements, the first consideration for the available funds is for preserving the road system. Improvements to preserve the surface will be timed in order to provide the best value for maintaining the asset. Where the road has deteriorated to the point that only major and costly improvements will restore the structural strength of the road, improvements will be timed in order to take full advantage of the remaining life of the infrastructure, but not to the extent where the road falls below minimum maintenance standards.

The second major component in the decision matrix is the Average Annual Daily Traffic (AADT) which provides an indication on the number of users of the road network. Priority is given to roads with higher AADT. As an example, if one street is a dead end and one street is a minor collector, and both cost the same per kilometre to reconstruct, the minor collector would be selected over the dead end since it serves more commuters.

Other factors that may have to be considered are safety, truck traffic, development, economic, social and timely scheduling of construction to coincide with other infrastructure works (e.g. sewers, watermain, etc.).

## 7.2 Upgrading Gravel Roads

As an increased number of otherwise rural areas in the municipality are developed, the expectation for hard surface roads also increases. Hard surface roads provide a number of improvements over gravel in terms of ride quality, however increased hard-surface roads result in additional maintenance costs and potential burden on capital budget. In order to optimize spending and develop an effective road management plan it is necessary to outline certain criteria as to when a road should be upgraded from gravel to hard surface. As outlined previously in this report there are a number of criteria, in addition to public opinion, which should be met prior to upgrading a gravel road. For the purposes of this study, the following criteria have been considered:

1. **Traffic Volume:** Surface type should correspond with average annual daily traffic (AADT) volumes, as this represents the demand for use of a road by the travelling public. In general, roads with an AADT over 150-200 may be considered for an upgrade to either surface treatment or asphalt. Consideration should also be given to the volume of heavy vehicles (trucks, farm equipment, etc.) that the road will service. It should also be noted that upgrading a gravel road to hard surface could itself generate traffic, as motorists generally prefer the increased ride quality offered by hard surface roads.
2. **Road Classification:** Practical classification of roads is an important criterion as it is an indicator of the relative importance of a road to the overall transportation network. Generally, gravel roads are feasible for local roads and low volume collectors; however consideration should be given to upgrading continuous roads in areas of increased population density. Consideration should also be given to school bus routes.
3. **Missing links between hard surface roads:** In order to deliver consistency in terms of ride and overall driver comfort, consideration should be given to providing a continuous surface type along commonly travelled routes within a transportation network. As such, priority may be given to upgrading gravel roads in areas which are primarily hard surface. Similarly, considerations should also be given to secluded segments of loose top roads in order to reduce maintenance costs associated with

In consideration of the above noted criteria, a number of loose top roads have been identified for upgrades to hard surface as part of the ten-year capital plan.

## 8.0 FORECAST CAPITAL BUDGET

Road Needs Studies typically consider maintenance and capital budgets separately. Maintenance activities are routinely performed and maintain the road at the current level of service, while capital expenses improve Township assets (i.e. road structure, bridges, etc.) and replace major pieces of equipment. The Township’s equipment and maintenance needs have been reviewed separately by the Township and as such this report focuses on capital expenditures relating to the roads. Historical capital budgets for the past five (5) years are summarized in Table 17, below:

**TABLE 17 – 2012-2016 HISTORICAL CAPITAL BUDGETS FOR ROADS**

CATEGORY	2012	2013	2014	2015	2016
ROADS	\$654,800	\$491,700	\$798,000	\$963,300	\$1,209,000

Gravel resurfacing only temporarily adds strength to the road structure, but over time the material is lost to the roadside through winter plowing, traffic, etc. To replace the loss of gravel, material is added periodically, usually bi-annually or every five (5) years depending on traffic volumes. The historical gravel resurfacing budget for the Township has been approximately \$254,000. Spending levels for gravel roads are lower than what one would normally expect given the number of lane kilometers of gravel roads, however the overall condition rating for loose top roads within the Township is adequate. At this time, there are no changes recommended to the gravel resurfacing program however the budget should be re-evaluated in five (5) years when the next study is completed.

The operational and maintenance budget should be adjusted each year to account for growth and inflation. Note that the right type of growth can produce efficiencies in providing services, for example densification where there is adequate infrastructure.

Capital spending values forecasted for the next 10 years were based on average historic spending levels and have been used in developing the ten year plan as discussed in the following section of this report. Based on historical spending and discussion with Township staff, it is anticipated that the Municipality will spend an average of approximately \$1,200,000 per year over the next 10 years. Capital budgets were projected and are presented in Table 18.

**TABLE 18 – FORECAST 2017 TO 2026 BUDGETS**

CATEGORY	2017	2018	2019	2020	2021
CAPITAL	\$1,233,000	1,219,000	1,122,100	1,161,800	\$1,225,600

CATEGORY	2022	2023	2024	2025	2026
CAPITAL	\$1,338,300	\$1,207,000	\$1,183,500	\$1,184,600	\$1,124,500

## 9.0 TEN YEAR CAPITAL PLAN FOR ROADS

### 9.1 Ten-Year Program

The Ten Year Program for hard surface road maintenance and gravel upgrades is presented in Table 19, based on historic spending levels and the anticipated budget as presented in Section 8.0.

A lifecycle analysis was used to forecast the year in which resurfacing or reconstruction for Asphalt and Surface Treated roads is most cost effective. The following strategy was developed in an effort to best allocate limited resources:

- Higher traffic roads are given priority over lower traffic volume roads;
- For surface treated roads, those requiring partial depth reconstruction are given priority over full depth reconstruction as this presents the most cost effective rehabilitation option;
- For asphalt roads, overlay projects are most cost effective and are therefore given priority over pulverize and pave/partial depth reconstruction. Full depth reconstruction provides the least return in terms of cost/benefit;
- Pavement preservation techniques (crack sealing, rejuvenating oil) are recommended where possible as a cost effective option for maintaining the condition rating of asphalt roads;
- Projects that are geographically close to each other are planned in the same year where feasible;

In addition to a proposed maintenance strategy for hard surface roads, the ten year plan also identifies several strategic gravel upgrades which aim to address the demand for increased hard surface roads in the network.

It should be noted that roads with higher than average traffic volumes or large volumes of trucks and heavy vehicles may deteriorate at a faster rate, and the Township should be prepared to adjust the program accordingly. Figures are presented in 2017 dollars and, as such, the Township should account for inflation each budget year.

**SOUTH STORMONT ROAD NEEDS UPDATE - TEN YEAR CAPITAL MAINTENANCE PROGRAM (\$1,000s)**

No.	STREET NAME	FROM	TO	KM	TYPE OF CONSTRUCTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
153	Anderson Road	Aultsville Road	Edge of South Dundas Boundary	1.90	DST w Fog Seal, Culvert Replacements (2017)	\$ 373.0									
187	Woodlands Road	0.2m north of Santa Cruz	Dead End	0.80	Gravel Upgrade to Asphalt (2017)	\$ 60.0									
197A	Mille Roches Road	Cherry Street	French Avenue	0.17	Gravel Upgrade to Asphalt, Section Repair (2017)	\$ 190.0									
215A	Sunset Drive	Lakeside Drive	Moulinette Island Causeway	0.70	Gravel Upgrade to Asphalt (2017)	\$ 600.0									
104	Duffy's Road	County Road 14	Morgan Road	1.20	Pulverize and DST (2018)		\$ 132.0								
105A	Morgan Road	County Road 18	Duffy's Road	0.30	Pulverize and DST (2018)		\$ 33.0								
105B	Morgan Road	Duffy's Road	Dafoe Road	2.00	SST Overlay (2018)		\$ 40.0								
123A	Aultsville Road	County Road 18	1.0km south of County Road 18	1.00	Pulverize and DST (2018)		\$ 110.0								
124A	North Lunenburg Road West	0.8km east of County Road 14	0.9km west of County Road 12	4.40	SST Overlay (2018)		\$ 88.0								
124C	North Lunenburg Road West	County Road 14	0.8km east of County Road 14	0.80	Single Lift Asphalt Overlay (2018), Crack Sealing (2022)		\$ 62.4				\$ 4.0				
152	Anderson Road	Farron's Point Road	Aultsville Road	3.50	Pulverize and DST (2018 - 2019)	\$ 274.5		\$ 274.5							
215	Lakeside Drive	Moulinette Island Causeway	Sunset Drive	1.30	Gravel Upgrade to Asphalt (2018 - 2019)	\$ 479.1		\$ 479.1							
216	East Island Causeway	Lakeside Drive	Dead End	0.50	Gravel Upgrade to Asphalt (2019)			\$ 368.5							
001	Island Road	Highway 138	0.1km west of Delaney Road	4.50	Crack Sealing (2020)				\$ 22.5						
004	Island Road	Delaney Road	Edge of South Glengarry Boundary	2.20	Pothole Repairs and SST Overlay (2020)				\$ 52.8						
005	Delaney Road	County Road 18	0.15 km of Island Road	1.00	Gravel Upgrade to Dual Surface Treatment (2020)				\$ 110.0						
006	Delaney Road	0.15 km of Island Road	North Branch Road	2.20	SST Overlay (2020)				\$ 44.0						
032	Headline Road	County Road 33	2.5km east of County Road 33	2.50	Asphalt Overlay - Semi-Urban (2020), Crack Sealing (2024)				\$ 230.0				\$ 12.5		
033	Headline Road	2.5km east of County Road 33	Highway 138	0.40	Partial Depth Asphalt Reconstruction - Semi-Urban (2020)				\$ 88.4						
052	Lawson Road	Maloney Road	Myers Road	2.30	Gravel Upgrade to DST w Fog Seal (2020)				\$ 253.0						
111A	Sandtown Road	County Road 12	1.5km west of County Road 12	1.50	SST Overlay (2020)				\$ 30.0						
111B	Sandtown Road	1.5km west of County Road 12	May Road	1.90	Pulverize and DST, Geotech Investigation (2020)				\$ 229.9						
178	Farran Street	County Road 2	Spruce Street	0.60	Asphalt Overlay - Semi-Urban (2020), Crack Sealing (2024)				\$ 55.2				\$ 3.0		
179	Farran Street	Spruce Street	45th Parallel Drive	0.50	Asphalt Overlay - Semi-Urban (2020), Crack Sealing (2024)				\$ 46.0				\$ 2.5		
044	MacMillan Corners Road	Highway 138	Edge of North Stormont Boundary	0.90	Pulverize and DST (2021)					\$ 99.0					
060	Myers Road	County Road 15	4.0km east of County Road 15	4.00	Partial Depth Asphalt Reconstruction - Rural (2021)				\$ 632.0						
197	Mille Roches Road	Cherry Street	County Road 36	0.70	Asphalt Overlay - Rural (2021), Crack Sealing (2025)				\$ 54.6					\$ 3.5	
115	Hunters Road	County Road 12	County Road 11	8.00	Pulverize and DST (2021-2022)				\$ 440.0	\$ 440.0					
042	Richmond Road	Lafarge Quarry Road	County Road 36	1.50	Gravel Upgrade to Asphalt (2022)					\$ 730.5					
061	Myers Road	4.0km east of County Road 15	O'Keefe Road	2.10	Asphalt Overlay - Rural (2022), Crack Sealing (2026)					\$ 163.8					\$ 10.5
040B	Atchenson Road	Richmond Drive	1.35km East of Richmond Drive	2.00	SST Overlay (2023)							\$ 40.0			
040C	Atchison Road	1.35km east of Richmond Drive	County Road 33	1.10	SST Overlay (2023)							\$ 22.0			
062A	Myers Road	O'Keefe Road	1.0km east of O'Keefe Road	1.00	Partial Depth Asphalt Reconstruction - Rural (2023)							\$ 158.0			
062B	Myers Road	1.0km east of O'Keefe Road	Highway 138	0.70	Asphalt Overlay - Rural (2023)							\$ 54.6			
074A	Northfield Road	Dixon Road	2.1km west of County Road 15	1.20	Pulverize and DST (2023)							\$ 132.0			
074B	Northfield Road	2.1km west of County Road 15	County Road 15	2.10	SST Overlay (2023)							\$ 42.0			
089B	Dafoe Road	1.2km east of Aultsville Road	2.1km west of County Road 14	2.70	Partial Depth Asphalt Reconstruction - Rural (2023)							\$ 426.6			
089C	Dafoe Road	County Road 14	2.1km west of County Road 14	2.10	Partial Depth Asphalt Reconstruction - Rural (2023)							\$ 331.8			
146	Manning Road	County Road 12	County Road 35	2.60	Asphalt Overlay - Semi-Urban (2024)								\$ 239.2		
191	Dale Street	Manning Road	Moak Street	0.50	Asphalt Overlay - Semi-Urban (2024)								\$ 46.0		
192	Moak Street	Dale Street	David Street	0.15	Asphalt Overlay - Semi-Urban (2024)								\$ 13.8		
193	David Street	Moak Street	Manning Road	0.50	Asphalt Overlay - Semi-Urban (2024)								\$ 46.0		
194	Brown Street	Dale Street	David Street	0.15	Asphalt Overlay - Semi-Urban (2024)								\$ 13.8		
230	Mack Street	Cornwall Center Road	Alguire Street	0.40	Partial Depth Asphalt Reconstruction - Semi-Urban (2024)								\$ 88.4		
231	Alguire Street	Mack Street	Melba Street	0.50	Partial Depth Asphalt Reconstruction - Semi-Urban (2024)								\$ 110.5		
237	Marydale Avenue	Dead End	Joseph Street	1.30	Partial Depth Asphalt Reconstruction - Semi-Urban (2024)								\$ 287.3		
245	Bruce Street	Dead End	Cornwall Center Road	1.00	Partial Depth Asphalt Reconstruction - Semi-Urban (2024)								\$ 221.0		
249	Cheryl Street	Marydale Avenue	Highway 138	0.45	Partial Depth Asphalt Reconstruction - Semi-Urban (2024)								\$ 99.5		
011	North Branch Road	South Glengarry Boundary	Delaney Road	1.80	SST Overlay (2025)									\$ 36.0	
087	Eaman Road	County Road 12	1.7km west of County Road 12	1.70	SST Overlay (2025)									\$ 187.0	
088	Eaman Road	1.7km west of County Road 12	County Road 14	3.50	SST Overlay (2025)									\$ 385.0	
106	North Valley Road	Otto Road	Elijah/Beckstead Road	2.80	SST Overlay (2025)									\$ 56.0	
113	Otto Road	County Road 14	May Road	3.20	SST Overlay (2025)									\$ 64.0	
161	St. Lawrence Street	Dead End @ West End	Dickinson Drive	1.40	Partial Depth Asphalt Reconstruction - Semi-Urban (2025)									\$ 309.4	
188	Santa Cruz	Woodlands Road	100m W of Woodlands Road	0.10	Partial Depth Asphalt Reconstruction - Semi-Urban (2025)									\$ 22.1	
189	Santa Cruz	100m west of Woodlands Road	Dickinson Drive	0.55	Partial Depth Asphalt Reconstruction - Semi-Urban (2025)									\$ 121.6	
046	Willy Allan Road	3.5km west of Hwy 138	County Road 15	5.40	Gravel Upgrade to DST (2026)										\$ 594.0
065	Valade Road	Highway #138	County Road 18	3.10	SST Overlay (2026)										\$ 62.0
068A	Windfall Road	County Road 35	2.5km northerly	2.60	SST Overlay (2026)										\$ 52.0
068B	Windfall Road	2.5km north of County Road 35	County Road 18	0.90	Pulverize and DST (2026)										\$ 99.0
102A	Bruning Road	Elijah/Beckstead Road	0.4km North	0.40	Pulverize to Gravel (2026)										\$ 8.0
148	Colonial Drive	Dead End (East End)	County Road 2	2.70	Asphalt Overlay - Rural (2026)										\$ 210.6
180	College Street	Farran Drive	Dickinson Drive	0.40	Partial Depth Asphalt Reconstruction - Semi-Urban (2026)										\$ 88.4
<b>TOTAL</b>					<b>106.37</b>	<b>\$ 1,223.0</b>	<b>\$ 1,219.0</b>	<b>\$ 1,122.1</b>	<b>\$ 1,161.8</b>	<b>\$ 1,225.6</b>	<b>\$ 1,338.3</b>	<b>\$ 1,207.0</b>	<b>\$ 1,183.5</b>	<b>\$ 1,184.6</b>	<b>\$ 1,124.5</b>

## 9.2 Adequacy of Current Spending

Table 20 presents the overall weighted average condition rating by year after applying the proposed capital works presented in Table 19.

**TABLE 20 – WEIGHTED AVERAGE CONDITON RATING SUMMARY**

CATEGORY	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
GRAVEL	6.31	6.32	6.29	6.18	6.32	6.32	6.31	5.99	5.99	5.92	6.26
LCB	6.81	6.34	6.24	5.83	5.76	5.85	5.70	5.47	5.02	5.21	5.25
HCB	5.68	5.51	5.46	5.40	5.37	5.45	5.29	5.43	5.54	5.46	5.37
<b>OVERALL</b>	<b>6.20</b>	<b>6.01</b>	<b>5.96</b>	<b>5.78</b>	<b>5.79</b>	<b>5.85</b>	<b>5.74</b>	<b>5.62</b>	<b>5.55</b>	<b>5.54</b>	<b>5.62</b>

The decreasing condition rating indicates that the municipality's roads are underfunded. On average, it is estimated that approximately \$1,870,800 per year for roads would be required in order to maintain the current level of service at its current condition rating, which is above current spending limits provided by the township. On average, this represents a shortfall of **\$671,800** per year for the proposed work in the ten-year capital plan. This suggests that the townships roads are underfunded, particularly as the overall level of service is anticipated to be fall below the preferred level of service (i.e. rating of > 6 for LCB and > 6.5 for HCB).

The consequences of underfunding include the steady degradation of assets, resulting in a reduction of associated levels of service. The consequences also include escalating repair and maintenance costs, as unexpected replacement of an asset in a state of failure often considerably more costly that rehabilitation of minor deficiencies.

It is recommended that the following actions be taken to help reduce the risks associated with underfunding:

- Adopt the 10-year capital plan for road reconstruction, as presented;
- Complete additional work as more funds become available; and
- Continue regular monitoring and valuation of roads and their conditions.

Implementing the recommended risk mitigation strategies will help to ensure reconstruction and maintenance activities are focused on areas in greatest need of repair. These strategies also ensure opportunities to promote increased levels of service with reduced capital costs are not missed. Additionally, identifying and addressing deficiencies in a timely manner reduces the likelihood of road conditions deteriorating to a point where emergency repairs may be necessary. Furthermore, timely rehabilitation of roads not only decreases risks of overall poor performance of the road network, but improves service levels while reducing long-term costs.



**APPENDIX A – IDEAL LIFECYCLE FOR ROADS**

## IDEAL LIFECYCLE FOR ROADS

TABLE A.1 - LIFE CYCLE FOR LCB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 0	LCB-R3	10.00	\$ 382,000
Year 1		9.53	
Year 2		9.06	
Year 3		8.59	
Year 4		8.12	
Year 5		7.65	
Year 6		7.18	
Year 7		6.71	
Year 8	LCB-R1	8.24	\$ 20,000
Year 9		7.77	
Year 10		7.30	
Year 11		6.83	
Year 12		6.36	
Year 13		5.89	
Year 14		5.42	
Year 15		4.95	
Year 16		4.48	
Year 17		4.01	
Year 18		3.54	
Year 19	LCB-R2	9.00	\$ 110,000
Year 20		8.53	
Year 21		8.06	
Year 22		7.59	
Year 23		7.12	
Year 24		6.65	
Year 25	LCB-R1	8.18	\$ 20,000
Year 26		7.71	
Year 27		7.24	
Year 28		6.77	
Year 29		6.30	
Year 30		5.83	
Year 31		5.36	
Year 32		4.89	
Year 33		4.42	
Year 34		3.95	
Year 35		3.48	
Year 36	LCB-R2	9.00	\$ 110,000
Year 37		8.53	
Year 38		8.06	
Year 39		7.59	
Year 40		7.12	

TABLE A.1 - LIFE CYCLE FOR LCB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 41		6.65	
Year 42	LCB-R1	8.18	\$ 20,000
Year 43		7.71	
Year 44		7.24	
Year 45		6.77	
Year 46		6.30	
Year 47		5.83	
Year 48		5.36	
Year 49		4.89	
Year 50		4.42	
Year 51		3.95	
Year 52		3.48	
Year 53		3.01	
Year 54		2.54	
Year 55		2.07	
AVERAGE		6.45	\$ 12,036

## IDEAL LIFECYCLE FOR ROADS

TABLE A.2 - LIFE CYCLE FOR HCB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 0	HCB-R3	10.00	\$ 487,000
Year 1		9.77	
Year 2		9.54	
Year 3		9.31	
Year 4		9.08	
Year 5		8.85	
Year 6		8.62	
Year 7		8.39	
Year 8	HCB-R6	8.91	\$ 12,000
Year 9		8.68	
Year 10		8.45	
Year 11		8.22	
Year 12		7.99	
Year 13		7.76	
Year 14		7.53	
Year 15		7.30	
Year 16		7.07	
Year 17		6.84	
Year 18		6.61	
Year 19		6.38	
Year 20	HCB-R1	9.15	\$ 78,000
Year 21		8.92	
Year 22		8.69	
Year 23		8.46	
Year 24	HCB-R4	8.98	\$ 5,000
Year 25		8.75	
Year 26		8.52	
Year 27		8.29	
Year 28	HCB-R6	8.81	\$ 12,000
Year 29		8.58	
Year 30		8.35	
Year 31		8.12	
Year 32		7.89	
Year 33		7.66	
Year 34		7.43	
Year 35		7.20	
Year 36		6.97	
Year 37		6.74	
Year 38		6.51	
Year 39		6.28	
Year 40		6.05	

TABLE A.2 - LIFE CYCLE FOR HCB-RURAL (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 41		5.82	
Year 42		5.59	
Year 43		5.36	
Year 44		5.13	
Year 45		4.90	
Year 46		4.67	
Year 47		4.44	
Year 48		4.21	
Year 49		3.98	
Year 50		3.75	
Year 51		3.52	
Year 52	HCB-R2	9.00	\$ 158,000
Year 53		8.77	
Year 54		8.54	
Year 55		8.31	
Year 56		8.08	
Year 57		7.85	
Year 58		7.62	
Year 59		7.39	
Year 60	HCB-R6	7.91	\$ 12,000
Year 61		7.68	
Year 62		7.45	
Year 63		7.22	
Year 64		6.99	
Year 65		6.76	
Year 66		6.53	
Year 67		6.30	
Year 68	HCB-R1	9.07	\$ 78,000
Year 69		8.84	
Year 70		8.61	
Year 71		8.38	
Year 72	HCB-R4	8.90	\$ 5,000
Year 73		8.67	
Year 74		8.44	
Year 75		8.21	
Year 76	HCB-R6	8.73	\$ 12,000
Year 77		8.50	
Year 78		8.27	
Year 79		8.04	
Year 80		7.81	
Year 81		7.58	

TABLE A.2 - LIFE CYCLE FOR HCB-RURAL (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 82		7.35	
Year 83		7.12	
Year 84		6.89	
Year 85		6.66	
Year 86		6.43	
Year 87		6.20	
Year 88		5.97	
Year 89		5.74	
Year 90		5.51	
Year 91		5.28	
Year 92		5.05	
Year 93		4.82	
Year 94		4.59	
Year 95		4.36	
Year 96		4.13	
Year 97		3.90	
Year 98		3.67	
Year 99		3.44	
Year 100		3.21	
AVERAGE		7.17	\$ 8,590

## IDEAL LIFECYCLE FOR ROADS

TABLE A.3 - LIFE CYCLE FOR HCB-SEMI-URBAN

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 0	HCB-S3	10.00	\$ 737,000
Year 1		9.77	
Year 2		9.54	
Year 3		9.31	
Year 4		9.08	
Year 5		8.85	
Year 6		8.62	
Year 7		8.39	
Year 8	HCB-S6	8.91	\$ 12,000
Year 9		8.68	
Year 10		8.45	
Year 11		8.22	
Year 12		7.99	
Year 13		7.76	
Year 14		7.53	
Year 15		7.30	
Year 16		7.07	
Year 17		6.84	
Year 18		6.61	
Year 19		6.38	
Year 20	HCB-S1	9.15	\$ 92,000
Year 21		8.92	
Year 22		8.69	
Year 23		8.46	
Year 24	HCB-S4	8.98	\$ 5,000
Year 25		8.75	
Year 26		8.52	
Year 27		8.29	
Year 28	HCB-S6	8.81	\$ 12,000
Year 29		8.58	
Year 30		8.35	
Year 31		8.12	
Year 32		7.89	
Year 33		7.66	
Year 34		7.43	
Year 35		7.20	
Year 36		6.97	
Year 37		6.74	
Year 38		6.51	
Year 39		6.28	
Year 40		6.05	

TABLE A.3 - LIFE CYCLE FOR HCB-SEMI-URBAN (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 41		5.82	
Year 42		5.59	
Year 43		5.36	
Year 44		5.13	
Year 45		4.90	
Year 46		4.67	
Year 47		4.44	
Year 48		4.21	
Year 49		3.98	
Year 50		3.75	
Year 51		3.52	
Year 52	HCB-S2	9.00	\$ 221,000
Year 53		8.77	
Year 54		8.54	
Year 55		8.31	
Year 56		8.08	
Year 57		7.85	
Year 58		7.62	
Year 59		7.39	
Year 60	HCB-S6	7.91	\$ 12,000
Year 61		7.68	
Year 62		7.45	
Year 63		7.22	
Year 64		6.99	
Year 65		6.76	
Year 66		6.53	
Year 67		6.30	
Year 68	HCB-S1	9.07	\$ 92,000
Year 69		8.84	
Year 70		8.61	
Year 71		8.38	
Year 72	HCB-S4	8.90	\$ 5,000
Year 73		8.67	
Year 74		8.44	
Year 75		8.21	
Year 76	HCB-S6	8.73	\$ 12,000
Year 77		8.50	
Year 78		8.27	
Year 79		8.04	
Year 80		7.81	
Year 81		7.58	

TABLE A.3 - LIFE CYCLE FOR HCB-SEMI-URBAN (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 82		7.35	
Year 83		7.12	
Year 84		6.89	
Year 85		6.66	
Year 86		6.43	
Year 87		6.20	
Year 88		5.97	
Year 89		5.74	
Year 90		5.51	
Year 91		5.28	
Year 92		5.05	
Year 93		4.82	
Year 94		4.59	
Year 95		4.36	
Year 96		4.13	
Year 97		3.90	
Year 98		3.67	
Year 99		3.44	
Year 100		3.21	
AVERAGE		7.17	\$ 12,000

## IDEAL LIFECYCLE FOR ROADS

TABLE A.4 - LIFE CYCLE FOR HCB-URBAN

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 0	HCB-U3	10.00	\$ 915,000
Year 1		9.77	
Year 2		9.54	
Year 3		9.31	
Year 4	HCB-U4	9.83	\$ 5,000
Year 5		9.60	
Year 6		9.37	
Year 7		9.14	
Year 8	HCB-U6	9.66	\$ 12,000
Year 9		9.43	
Year 10		9.20	
Year 11		8.97	
Year 12		8.74	
Year 13		8.51	
Year 14		8.28	
Year 15		8.05	
Year 16		7.82	
Year 17		7.59	
Year 18		7.36	
Year 19		7.13	
Year 20		6.90	
Year 21		6.67	
Year 22		6.44	
Year 23		6.21	
Year 24	HCB-U1	8.98	\$ 318,000
Year 25		8.75	
Year 26		8.52	
Year 27		8.29	
Year 28	HCB-U4	8.81	\$ 5,000
Year 29		8.58	
Year 30		8.35	
Year 31		8.12	
Year 32	HCB-U6	8.64	\$ 12,000
Year 33		8.41	
Year 34		8.18	
Year 35		7.95	
Year 36		7.72	
Year 37		7.49	
Year 38		7.26	
Year 39		7.03	
Year 40		6.80	

TABLE A.4 - LIFE CYCLE FOR HCB-URBAN (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 41		6.57	
Year 42		6.34	
Year 43		6.11	
Year 44		5.88	
Year 45		5.65	
Year 46		5.42	
Year 47		5.19	
Year 48		4.96	
Year 49		4.73	
Year 50		4.50	
Year 51		4.27	
Year 52		4.04	
Year 53		3.81	
Year 54		3.58	
Year 55		3.35	
Year 56	HCB-U2	9.00	\$ 360,000
Year 57		8.77	
Year 58		8.54	
Year 59		8.31	
Year 60	HCB-U4	8.83	\$ 5,000
Year 61		8.60	
Year 62		8.37	
Year 63		8.14	
Year 64	HCB-U6	8.66	\$ 12,000
Year 65		8.43	
Year 66		8.20	
Year 67		7.97	
Year 68		7.74	
Year 69		7.51	
Year 70		7.28	
Year 71		7.05	
Year 72		6.82	
Year 73		6.59	
Year 74		6.36	
Year 75	HCB-U1	9.13	\$ 318,000
Year 76		8.90	
Year 77		8.67	
Year 78		8.44	
Year 79	HCB-U4	8.96	\$ 5,000
Year 80		8.73	
Year 81		8.50	

TABLE A.4 - LIFE CYCLE FOR HCB-URBAN (CONT.)

YEAR	RECONST. TYPE	CONDIT'N RATING	\$\$\$ / KM
Year 82		8.27	
Year 83	HCB-U6	8.79	\$ 12,000
Year 84		8.56	
Year 85		8.33	
Year 86		8.10	
Year 87		7.87	
Year 88		7.64	
Year 89		7.41	
Year 90		7.18	
Year 91		6.95	
Year 92		6.72	
Year 93		6.49	
Year 94		6.26	
Year 95		6.03	
Year 96		5.80	
Year 97		5.57	
Year 98		5.34	
Year 99		5.11	
Year 100		4.88	
AVERAGE		7.52	\$ 19,790

## **APPENDIX B – 2016 ROAD APPRAISALS**

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
001	Island Road	Highway 138	0.1km west of Delaney Road	4.50	N	R	HCB	7	20	6	Y	200-399	6.00	8.50	8.00
002	Lefebvre Road	Island Road	County Road 18	0.10	N	R	HCB	7	20	6	Y		6.00	3.00	8.00
004	Island Road	Delaney Road	Edge of South Glengarry Boundary	2.20	N	R	LCB	7	20		Y		8.00	5.50	4.00
005	Delaney Road	County Road 18	0.15 km of Island Road	1.00	N	R	G	7	20	6	N	50-199	5.00	7.00	7.00
006	Delaney Road	0.15 km of Island Road	North Branch Road	2.20	N	R	LCB	7.5	20	6	Y	50-199	9.00	8.00	7.00
007	Willy Bill Road	North Branch Road	Froats Road	4.80	N	R	G	6.5	16		Y		3.00	6.00	6.00
008	Froats Road	Willy Bill Road	Dead End	0.90	Y	R	G	5	12		N	0-49	6.00	6.00	5.00
009	Pineridge Road	South Glengarry Boundary	Willy Bill Road	0.40	N	R	G	7	12		N		6.00	6.00	6.00
010	Bingley Road	Willy Bill Road	Dead End	1.50	N	R	G	6.5	16		N	0-49	6.00	6.00	6.00
011	North Branch Road	South Glengarry Boundary	Delaney Road	1.80	N	R	LCB	7.5	20	6	Y	100-299	8.00	4.00	9.00
013	McPhail Road	0.4km west of Delaney Road	2.8km west of Delaney Road	2.80	N	R	LCB	8	20	6	Y		8.00	4.00	7.00
014	Beagle Club Road	McPhail Road	Dead End	0.40	N	R	G	7	16			0-49	6.00	6.00	6.00
015	McPhail Road	2.8km west of Delaney Road	Highway 138	1.80	N	R	HCB		20	6	Y		5.00	9.00	9.00
017	Amell Road	Highway 138	Dead End	1.90	Y	R	LCB	8	20		Y	0-49	8.00	6.50	6.00
018	Archambault Road	Highway 138	Dead End	0.90	N	R	G	6.5	12		Y	0-49	5.00	5.00	5.00
019	DeWit Road	County Road 18	Dead End	0.50	N	R	G	4.5	12		N	0-49	3.00	3.00	4.00
020	Willis Street	County Road 18	Haughton Street	0.10	N	R	HCB	7	20	6	Y	0-49	7.00	5.75	5.00
021	Haughton Street	Willis Street	Dead End	0.20	N	R	HCB	7.5	20	6	Y	0-49	7.00	5.50	5.00
022	Carleton Street	Highway 138	Dead End	0.15	N	R	HCB	7	20	6	Y	0-49	7.00	5.75	4.00
023	Fraser Street	County Road 18	Dead End	0.30	N	R	HCB	7	20	6	Y	0-49	7.00	5.00	4.00
024	McIntosh Road	County Road 18	Dead End	0.20	N	R	HCB	7	20	6	N	0-49	8.00	5.00	4.00
025	Charles Road	County Road 44	Dead End	0.25	N	R	G	8			N	0-49	7.00	7.00	7.00
026	Dow Street	Highway 138	Dead End	0.25	N	R	HCB	10	20	6	Y	0-49	8.00	6.50	6.00
027	Poirier Avenue	Cornwall Centre Road	Dead End	0.10	N	S	G	16	20	16	N	0-49	7.00	7.00	5.00
028	Julien Street	Cornwall Centre Road	Dead End	0.10	N	R	G	7			N	0-49	6.00	5.00	5.00
029	Speer Road	Cornwall Centre Road	Dead End	0.90	N	R	HCB	8	20	6	Y	0-49	8.00	6.60	5.00
030	Barlow Road	County Road 33	Dead End	0.60	N	R	G	7			N	0-49	7.00	6.00	6.00
031	Headline Road	County Road 33	Dead End	0.10	N	S	G	7	20		N	400-999	7.00	7.00	6.00
032	Headline Road	County Road 33	2.5km east of County Road 33	2.50	N	S	HCB	8	20	6	Y	999+	3.00	8.00	7.00
033	Headline Road	2.5km east of County Road 33	Highway 138	0.40	N	S	HCB	8	20	6	Y	999+	8.00	6.00	4.00

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
034	Charlotte Avenue	Headline Road	Dead End	0.25	N	S	HCB	8	20	6	N	0-49	8.00	6.50	<b>6.00</b>
035	Cedarview Road	Headline Road	Dead End	0.40	N	S	HCB	8	20	6	Y	0-49	8.00	5.00	<b>4.00</b>
036	Marl Road	Cedarview Road	Dead End	0.10	N	S	HCB	8	20	6	N	0-49	8.00	6.00	<b>5.00</b>
037	Poplar Avenue	Headline Road	Beaver Dam Road	0.50	N	S	HCB	8	20	6	Y	50-199	6.00	4.75	<b>4.00</b>
038	Beaver Dam Road	Poplar Avenue	County Road 33	1.20	N	S	HCB	8	20	6	Y	50-199	8.00	5.50	<b>5.00</b>
039	Equestrian Road	Beaver Dam Road	Beaver Dam Road	0.50	N	S	HCB	8	20	6	Y	50-199	8.00	6.00	<b>5.00</b>
041	Richmond Road	Cornwall City Limits	Lafarge Quarry Road	0.90	N	S	HCB	8	20	6	Y		7.00	9.00	<b>9.00</b>
042	Richmond Road	Lafarge Quarry Road	County Road 36	1.50	N	R	G	8	20		Y	<b>200-399</b>	6.00	6.00	<b>7.00</b>
043	Quail Road	Highway 138	Dead End	2.60	Y	R	G	7	16		Y	0-49	3.00	3.00	<b>5.50</b>
044	MacMillan Corners Road	Highway 138	Edge of North Stormont Boundary	0.90	Y	R	LCB	7.5		6	Y		7.00	6.00	<b>5.00</b>
045	Willy Allan Road	Highway 138	3.5km west of Hwy 138	3.50	N	R	HCB	8	20	6	Y	50-199	8.00	6.00	<b>5.00</b>
046	Willy Allan Road	3.5km west of Hwy 138	County Road 15	5.40	N	R	G	8	20		Y	<b>50-199</b>	7.00	7.00	<b>7.00</b>
047	Cornwall-Roxborough Bou	County Road 15	Dead End	2.10	Y	R	G	6.5	20		Y	0-49	6.00	6.00	<b>6.00</b>
048	Cornwall-Roxborough Bou	County Road 15	Dead End	1.30	Y	R	G	6.5	12		Y	0-49	6.00	6.00	<b>6.00</b>
049	Black River Road	County Road 15	County Road 18	2.85	N	R	HCB	8	20	6.2	Y	<b>50-199</b>	8.00	6.00	<b>4.00</b>
050	Brunet Road	Black River Road	Dead End	2.10	N	R	G	7	20		Y	<b>50-199</b>	6.00	6.00	<b>6.00</b>
051	McClave Road	County Road 18	Maloney Road	0.20	N	R	HCB	8	20	6	Y		8.00	6.50	<b>6.00</b>
052	Lawson Road	Maloney Road	Myers Road	2.30	N	R	G	7.5	16		Y	50-199	6.00	6.00	<b>7.00</b>
053	McGillis Road	Myers Road	Willy Allan Road	1.80	N	R	G	8			Y	50-199	7.00	7.00	<b>7.00</b>
054	Allinotte Road	Willy Allan Road	Dead End	0.30	N	R	G	6	20		Y	0-49	7.00	7.00	<b>5.00</b>
055	Campeau Road	Willy Allan Road	Dead End	0.30	N	R	G	7.5	20		N	0-49	7.00	7.00	<b>6.00</b>
056	O'Keefe Road	Myers Road	Wheeler Road	1.85	N	R	HCB	8	20	6	Y		8.00	6.00	<b>5.00</b>
057	O'Keefe Road	Maloney Road	Valade Road	1.35	N	R	G	5.5	20		N	<b>200-399</b>	2.00	2.00	<b>3.00</b>
058	Wheeler Road	Highway 138	O'Keefe Road	1.60	N	R	HCB	7.5	20	6	Y	<b>200-399</b>	7.00	5.00	<b>4.00</b>
059	Maloney Road	O'Keefe Road	County Road 18	3.20	N	R	HCB	7.5	20	6	Y	<b>50-199</b>	6.00	4.75	<b>4.00</b>
060	Myers Road	County Road 15	4.0km east of County Road 15	4.00	N	R	HCB	7.5	20	6	Y	<b>400-999</b>	6.00	4.75	<b>4.00</b>
061	Myers Road	4.0km east of County Road 15	O'Keefe Road	2.10	N	R	HCB	6.5	20	6	Y	<b>400-999</b>	10.00	8.00	<b>7.00</b>
062A	Myers Road	O'Keefe Road	1.0km east of O'Keefe Road	1.00	N	R	HCB	7	20	6	Y	<b>400-999</b>	6.00	4.50	<b>4.00</b>
062B	Myers Road	1.0km east of O'Keefe Road	Highway 138	0.70	N	R	HCB	7	20	6	Y	<b>400-999</b>	9.00	7.50	<b>7.00</b>
063	Cornett Lane	Myers Road	Dead End	0.40	N	R	HCB	8	20	6	Y	0-49	4.00	2.75	<b>3.00</b>



## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
064	Barcier Lane	Myers Road	Dead End	0.30	N	S	G	6	20		N	0-49	7.00	7.00	<b>6.00</b>
065	Valade Road	Highway #138	County Road 18	3.10	N	R	LCB	7.5	20	6	Y	<b>100-299</b>	6.00	9.00	<b>9.00</b>
066	Chisholm Road	County Road 18	County Road 36	0.95	N	R	G	7.5	20		Y		7.00	7.00	<b>7.00</b>
067	Losey Road	Windfall Road	County Road 29	1.20	N	R	G	7.5			Y	<b>0-49</b>	6.00	6.00	<b>6.00</b>
069	Northfield Road	County Road 18	Dixon Road	4.60	N	R	G	7.5	20	6	Y	400-999	8.00	7.00	<b>7.00</b>
070	Central Road	Northfield Road	Dead End (Laneway)	0.10	N	R	G	6	20		N	0-49	4.00	4.00	<b>4.00</b>
071	Cleary Road	Northfield Road	Dead End	0.25	N	R	G	6.5	20		N	0-49	6.00	6.00	<b>6.00</b>
072	Eamer Road	Northfield Road	1.6km east of Northfield	1.60	N	R	G	8	20		Y		7.00	7.00	<b>7.00</b>
073	Eamer Road	1.6km east of North Field Road	County Road 15	1.40	N	R	LCB	8	20		Y		7.00	6.00	<b>7.00</b>
076	Dixon Road	Northfield Road	MacRae Road	0.65	N	R	LCB	8	20		Y	<b>50-199</b>	7.00	7.00	<b>7.00</b>
077	Dixon Road	MacRae Road	County Road 12	2.80	N	R	LCB	7.5	20	6	Y		7.00	5.00	<b>3.00</b>
078	Bilmer Road	Dixon Road	Dead End	0.10	N	R	HCB	8		6	N	0-49	2.00	2.00	<b>2.00</b>
079	Stata Road	Dixon Road	North Lunenburg Road East	2.10	N	R	G	8	20		Y		7.00	7.00	<b>7.00</b>
080	North Lunenburg Road East	County Road 12	Northfield Road	1.90	N	R	LCB	7	20	6	Y	400-999	6.00	3.50	<b>3.00</b>
081	MacRae Road	Dixon Road	Hoople Seventh Road	1.80	N	R	G	7.5			Y		7.00	7.00	<b>7.00</b>
082	Hoople Seventh Road	MacRae Road	County Road 12	2.70	N	R	G	7.5	20		Y		7.00	7.00	<b>7.00</b>
083	Helmer Road	Hoople Seventh Road	Dead End (Laneway)	0.50	N	R	G	6			N	0-49	3.00	3.00	<b>5.00</b>
084	Helmer Road	Hoople Seventh Road	County Road 14	2.20	N	R	G	7.5			Y		6.00	6.00	<b>7.00</b>
085	Saving Street	County Road 14	2.3km east of County Road 14	2.30	N	R	HCB	6.5	20	6	Y	<b>50-199</b>	6.00	4.00	<b>3.00</b>
086	Saving Street	2.3km east of County Road 14	North Stormont Boundary	0.40	N	R	G	7	20	6	Y	<b>50-199</b>	6.00	6.00	<b>6.00</b>
087	Eaman Road	County Road 12	1.7km west of County Road 12	1.70	N	R	LCB	7	20	6	Y		5.00	9.00	<b>7.00</b>
088	Eaman Road	1.7km west of County Road 12	County Road 14	3.50	N	R	LCB	7		6	Y		7.00	3.50	<b>4.00</b>
090	Dafoe Road	Aultsville Road	Mel's Lane	1.90	N	R	G	7			Y	<b>400-999</b>	7.00	7.00	<b>7.00</b>
091	Mel's Lane	Dafoe Road	Edge of South Dundas Boundary	0.20	N	R	G	5.5			Y	0-49	Maintained by South	Maintained by S Dundas	<b>6.00</b>
092	Haystead Road	South Dundas Boundary	Groves Road	0.20	N	R	G	6.5			Y			Maintained by S Dundas	
093	Groves Road	Haystead Road	County Road 18	1.10	N	R	G	6.5			Y		7.00	7.00	<b>7.00</b>
094	Edwards Road	County Road 18	County Road 11	2.50	N	R	G	7			Y		7.00	7.00	<b>7.00</b>
095	Pleasant Valley Road	County Road 11	Rombough Road	2.30	N	R	G	8			Y	<b>0-49</b>	8.00	7.00	<b>7.00</b>
097	Rombough Road	Pleasant Valley Road	Elijah/Beckstead Road	2.30	N	R	LCB	7.5		6	Y		7.00	3.00	<b>8.00</b>
098	Neville Road	Rombough Road	County Road 14	2.00	N	R	LCB	8		6	Y	50-199	9.00	8.00	<b>7.00</b>

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
099	Hollister Road	County Road 14	Elijh/Beckstead Road	0.70	N	R	G	6.5			N	0-49	6.00	6.00	<b>6.00</b>
100	Eligh/Beckstead Road	County Road 14	2.0km East of County Road 11	1.30	N	R	LCB	7.5		6	Y	<b>50-199</b>	7.00	3.00	<b>8.00</b>
101	Eligh/Beckstead Road	3.5 km West of County Road 14	County Road 11	0.90	N	R	LCB	6.5			Y	<b>50-199</b>		6.00	<b>7.00</b>
103	Gravel Pit Road	Eaman Road	County Road 18	1.75	N	R	G	8			Y		7.00	7.00	<b>7.00</b>
104	Duffy's Road	County Road 14	Morgan Road	1.20	N	R	LCB	7.5		6	Y	<b>50-199</b>	7.00	3.50	<b>3.50</b>
106	North Valley Road	Otto Road	Elijh/Beckstead Road	2.80	N	R	LCB	7.5		6	Y	<b>50-199</b>	7.00	3.00	<b>9.00</b>
107	Hart Road	North Valley Road	Bush Glen Road	2.10	N	R	G	7.5			Y		7.00	7.00	<b>7.00</b>
108	Collins Road	Bush Glen Road	County Road 11	2.80	N	R	G	5.5			Y		6.00	5.00	<b>5.00</b>
112	Froats Road	County Road 14	Dead End	0.15	N	R	G	6			N	0-49	5.00	5.00	<b>4.00</b>
113	Otto Road	County Road 14	May Road	3.20	N	R	LCB	7.5		6	Y	<b>50-199</b>	5.00	3.00	<b>8.00</b>
114	Trillium Road	May Road	Landfill Site (Dead End)	0.90	N	R	G	6			N	0-49	5.00	5.00	<b>6.00</b>
115	Hunters Road	County Road 12	County Road 11	8.00	N	R	LCB	7.5		6	Y	<b>50-199</b>	6.00	5.00	<b>4.00</b>
116	Goldfield Road	Hunters Road	Edge of North Stormont Boundary	0.55	N	R	G	7			Y		7.00	7.00	<b>7.00</b>
117	Wittenveen Road	Hunter Road	Edge of North Stormont Boundary	0.80	N	R	G	7			Y		7.00	7.00	<b>7.00</b>
119	Nine Mile Road	Allen Road	Hunters Road	2.10	N	R	E	4			N	0-49	2.00	2.00	<b>2.00</b>
120	Lalonde Road	Allen Road	Collins Road	2.20	N	R	E	5			N	0-49	4.00	4.00	<b>1.00</b>
121	Mary's Road	County Road 11	County Road 18	3.40	N	R	G	6.5			N		7.00	6.00	<b>6.00</b>
122	Whipperwill Lane	Mary's Road	The edge of South Dundas Boundary	0.50	N	R	G				Y		6.00	6.00	<b>5.00</b>
125	Bunker Hill Road	County Road 14	Dead End (Laneway)	0.10	N	R	G	5			N		5.00	5.00	<b>4.00</b>
126	Cooper Road	North Lunenburg Road West	2.4km north of North Lunenburg Road	2.40	N	R	G	7.5			Y	<b>50-199</b>	7.00	7.00	<b>7.00</b>
127	Cooper Road	County Road 12	2.0km west of County Road 12	2.00	N	R	HCB	7.5		6	Y		5.00	3.00	<b>3.00</b>
128	Moak Road	County Road 12	Dead End	0.40	N	R	G	6.5			N		6.00	6.00	<b>6.00</b>
129	Raymond Road	County Road 12	Zeran Road	2.00	N	R	G	6.5			Y	<b>50-199</b>	6.00	6.00	<b>6.00</b>
130	Zeran Road	County Road 14	County Road 12	3.90	N	R	G	6.5			Y	<b>0-49</b>	6.00	6.00	<b>7.00</b>
131	Forestry Road	County Road 12	County Road 12	0.60	N	R	G	6			Y	0-49	5.00	5.00	<b>5.00</b>
132	Smith Road	County Road 12	Waldroff Road	2.00	N	R	G	6.5			N	<b>0-49</b>	6.00	6.00	<b>6.00</b>
136	Fairground Drive	County Road 14	Elm Street	0.20	N	R	HCB	8		6	N	<b>50-199</b>	5.00	3.75	<b>3.50</b>
137	Elm Street	Fairground Drive	County Road 14	0.40	N	R	HCB	8		6	N	<b>100-299</b>	5.00	3.75	<b>3.50</b>
138	Ash Street	County Road 14	Fairground Drive	0.40	N	R	HCB	8		6	N	0-49	5.00	3.75	<b>3.50</b>
139	Mill Street	Elm Street	County Road 14	0.20	N	R	HCB	8		6	N	0-49	4.00	2.75	<b>3.00</b>

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
140	Duval Street	County Road 14	Ash Street	0.10	N	R	HCB	8		6	N	0-49	4.00	2.75	<b>4.00</b>
141	Loyalist Crescent	County Road 12	County Road 12	0.70	N	R	HCB	8	20	6	Y	0-49	8.00	6.00	<b>6.00</b>
142	Bayview Road	County Road 2	Manning Road	0.10	N	R	HCB	7		6	Y	0-49	5.00	8.00	<b>8.00</b>
143	Windermere Drive	Manning Road	Dead End	0.35	N	R	HCB	8		6	Y	0-49	6.00	4.50	<b>4.00</b>
144	Manning Road	Dead End	County Road 12	0.90	N	R	HCB				Y	0-49	10.00	7.00	<b>7.00</b>
145	Stuart Road	Manning Road	Dead End	0.10	N	R	LCB	8		6	N		10.00	3.00	<b>9.00</b>
146	Manning Road	County Road 12	County Road 35	2.60	N	S	HCB	8		6	Y	<b>400-999</b>	10.00	9.00	<b>7.00</b>
147	Vin Vista Drive	County Road 2	Dead End	1.10	N	S	HCB	7.5		6	Y	0-49	10.00	7.00	<b>6.00</b>
148	Colonial Drive	Dead End (East End)	County Road 2	2.70	N	R	HCB	7.5		6	Y	<b>50-199</b>	10.00	7.50	<b>7.00</b>
149	Farron's Point Road	County Road 2	0.3 km North	0.30	N	R	HCB	7.5		6	Y		4.00	7.50	<b>5.00</b>
150	Farron's Point Road	North End of Section 149	1.3 km North of County Road 2	1.00	N	R	G	7			Y	0-49	6.00	6.00	<b>7.00</b>
151	Farron's Point Road	1.3 km North of County Road 2	Dead End (@ CNR Line)	0.30	N	R	G	6			N	0-49	4.00	4.00	<b>4.00</b>
152	Anderson Road	Farron's Point Road	Aultsville Road	3.50	N	R	HCB	7		6	Y	<b>50-199</b>	5.00	3.00	<b>3.00</b>
153	Anderson Road	Aultsville Road	Edge of South Dundas Boundary	1.90	N	R	HCB	7		6	Y	<b>50-199</b>	4.00	2.75	<b>2.50</b>
155	Ault Island Road	County Road 2	Willbruck Drive	1.80	N	R	HCB	8		6	Y		7.00	5.50	<b>5.00</b>
156	Willbruck Drive	Ault Island Road	Dead End	1.80	N	R	HCB	8		6	Y	<b>200-399</b>	6.00	4.50	<b>4.00</b>
157	McLeod Road	County Road 2	Dead End	0.20	N	R	HCB	6		4	N	0-49	4.00	2.75	<b>3.00</b>
158	Kilarney Avenue	County Road 2	St. Lawrence Street	0.10	N	S	HCB	8		6	Y		7.00	5.75	<b>4.00</b>
159	Piercy Street	St. Lawrence Street	Dead End	0.40	N	S	HCB	10		9.7	N	0-49	8.00	7.50	<b>7.00</b>
160	Napier Street	St. Lawrence Street	Dead End	0.20	N	S	HCB	8		6	Y	0-49	7.00	5.50	<b>5.00</b>
161	St. Lawrence Street	Dead End @ West End	Dickinson Drive	1.40	N	S	HCB	8		6	Y	200-399	7.00	5.75	<b>5.00</b>
162	Thorold Lane	Dickinson Drive	Bank Street	0.20	N	S	HCB			6	Y		7.00	5.75	<b>6.00</b>
164	Maple Street	Farran Drive	Farran Drive	0.65	N	S	HCB	7		6	Y	0-49	4.00	2.75	<b>9.00</b>
165	Maple Street	Farran Drive	Dickinson Drive	0.35	N	S	HCB	7		6	Y		7.00	5.75	<b>9.00</b>
166	Bank Street	County Road 2	Maple Street	0.25	N	S	HCB	8		6	Y	400-999	7.00	5.75	<b>8.00</b>
167	Memorial Square East	Maple Street	College Street	0.25	N	U	HCB			7	Y	0-49	7.00	5.75	<b>9.00</b>
168	Memorial Square West	College Street	Maple Street	0.25	N	U	HCB			8	Y	0-49	7.00	5.75	<b>6.00</b>
169	Shaver Road	Colonial Road	0.7 km North	0.70	N	R	LCB	7.5		7	N	0-49	3.00	2.00	<b>8.00</b>
170	Shaver Road	0.7km north of Colonial Drive	Dead End	1.00	N	R	E	6.5			N	0-49	2.00	2.00	<b>2.50</b>
171	Shaver Road	Colonial Road	County Road 2	0.15	N	S	HCB						10.00	5.00	<b>8.00</b>

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
172	Ault Street	St. Lawrence Street	Hickory Street	0.40	N	S	HC	9		7		N	6.00	8.00	<b>8.00</b>
173	Ault Street	Hickory Street	Dead End	0.30	N	U	HC			7.5	N	0-49	7.00	8.00	<b>7.00</b>
175	Hickory Street	Piercy Street	Ault Street	0.50	N	S	HC	9		7	N	0-49	7.00	8.00	<b>8.00</b>
176	Hickory Street	Ault Street	Farran Drive	0.70	N	S	HC	9		7	N		7.00	5.50	<b>5.00</b>
177	Spruce Street	Farran Drive	Hickory Street	0.40	N	S	HC	9		7	N	0-49	5.00	3.00	<b>9.00</b>
178	Farran Street	County Road 2	Spruce Street	0.60	N	S	HC	9		7	N	<b>400-999</b>	7.00	7.00	<b>6.00</b>
179	Farran Street	Spruce Street	45th Parallel Drive	0.50	N	S	HC	9		7		<b>400-999</b>	9.00	7.00	<b>7.00</b>
180	College Street	Farran Drive	Dickinson Drive	0.40	N	S	HC	VARIABLES		7		400-999	7.00	5.75	<b>5.00</b>
181	45th Parallel Drive	Dickinson Drive	Farran Drive	0.40	N	S	HC	9		7	N		8.00	8.00	<b>8.00</b>
182	Railway Street	Industrial Drive	Dead End	0.30	N	R	HC	7.5		6	N	0-49	2.00	3.00	<b>3.00</b>
183	Elm Street	Dickinson Drive	Wales Drive	0.50	N	S	HC	9		7	N		7.00	5.75	<b>6.00</b>
184	Hoople Street	Wales Drive	Elm Street	0.45	N	S	HC	9		7	N	0-49	7.00	7.00	<b>5.00</b>
185	Wales Drive	Dead End	County Road 2	0.60	N	S	HC	9		7	N		7.00	5.75	<b>5.00</b>
186	Woodlands Road	Santa Cruz	0.2km North	0.20	N	S	HC	8		6	N	0-49	7.00	7.00	<b>5.00</b>
187	Woodlands Road	0.2m north of Santa Cruz	Dead End	0.80	N	R	G	8		6	N	0-49	6.00	6.00	<b>6.00</b>
188	Santa Cruz	Woodlands Road	100m W of Woodlands Road	0.10	N	S	HC	9		7	N	<b>200-399</b>	6.00	5.75	<b>4.00</b>
189	Santa Cruz	100m west of Woodlands Road	Dickinson Drive	0.55	N	S	HC	9		7		<b>200-399</b>	6.00	5.00	<b>5.00</b>
190	Maxwell Avenue	Santa Cruz	Wales Drive	0.50	N	S	HC	9		7	N	<b>50-199</b>	7.00	4.75	<b>5.00</b>
191	Dale Street	Manning Road	Moak Street	0.50	N	S	HC	8		6	N	<b>50-199</b>	8.00	5.75	<b>7.00</b>
192	Moak Street	Dale Street	David Street	0.15	N	S	HC	8		6	N	0-49	7.00	6.00	<b>7.00</b>
193	David Street	Moak Street	Manning Road	0.50	N	S	HC	8		6	N	<b>50-199</b>	8.00	7.00	<b>7.00</b>
194	Brown Street	Dale Street	David Street	0.15	N	S	HC	8		6	N	0-49	8.00	7.00	<b>7.00</b>
195	Simcoe Street	County Road 35	Mille Roches Road	0.50	N	S	HC	9		7	N		6.00	7.00	<b>5.00</b>
196	Barnhart Drive	Mille Roches Road	Dead End	0.50	N	U	HC			9	N	0-49	8.00	7.00	<b>7.00</b>
197	Mille Roches Road	Cherry Street	County Road 36	0.70	N	S	HC	8		6	N	<b>999+</b>	9.00	4.50	<b>6.00</b>
198	Cherry Street	Mille Roche Road	French Avenue	0.40	N	U	HC			7	N		7.00	6.75	<b>6.00</b>
199	French Avenue	Cherry Street	County Road 35	0.40	N	S	HC	9		7	N	<b>200-399</b>	7.00	7.00	<b>6.00</b>
200	McNiff Avenue	County Road 35	Dead End	0.10	N	R	G	9		9	N	0-49	7.00	7.00	<b>7.00</b>
201	Ouellette Avenue	County Road 35	French Avenue	0.40	N	S	HC			7	N	0-49	7.00	5.50	<b>5.00</b>
202	Strachan Avenue	County Road 36	St. Laurent Avenue	0.30	N	S	HC	9		7	N		7.00	5.50	<b>8.00</b>

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203	St. Laurent Avenue	Saunders Avenue	County Road 35	0.40	N	S	HCB	9		7			7.00	5.50	<b>8.00</b>
204	Johnson Crescent	County Road 35	County Road 35	0.50	N	S	HCB	9		7	N	50-199	9.00	5.75	<b>9.00</b>
205	Gray Avenue	County Road 35	Johnson Crescent	0.20	N	S	HCB	9		7	N	0-49	9.00	5.75	<b>9.00</b>
206	Saunders Avenue	Strachan Avenue	Frost Avenue	0.75	N	S	HCB	9		7	N		4.00	7.50	<b>7.00</b>
207	Frost Avenue	Strachan Avenue	Mille Roche Road	0.50	N	S	HCB	9		7	N		6.00	7.50	<b>7.00</b>
209	Plaza Street	Long Sault Drive	Simcoe Street	0.10	N	S	HCB	9		7	N		7.00	2.75	<b>3.00</b>
210	Bethune Avenue	Mille Roche Road	Mille Roche Road	0.65	N	S	HCB	9		7	N		7.00	8.00	<b>7.00</b>
211	Kent Crescent	Bethune Avenue	Bethune Avenue	0.45	N	S	HCB	9		7	N	0-49	6.00	5.75	<b>6.00</b>
212	Dixon Avenue	Bethune Avenue	Kent Crescent	0.10	N	S	HCB	9		7	N	0-49	6.00	5.50	<b>6.00</b>
213	Robin Road	County Road 2	Dead End	0.20	N	S	HCB	8		6	N	<b>50-199</b>	7.00	5.75	<b>8.00</b>
214	Moulinette Island Causeway	Long Sault Parkway	Lakeside Drive	1.20	N	R	HCB			6	N	<b>400-999</b>	6.00	6.00	<b>4.00</b>
215	Lakeside Drive	Moulinette Island Causeway	Sunset Drive	1.30	N	R	G	7.5			N	<b>50-199</b>	5.00	5.00	<b>5.00</b>
215A	Sunset Drive	Lakeside Drive	Moulinette Island Causeway	0.70	N	R	G	7.5			N	<b>50-199</b>	5.00	5.00	<b>5.00</b>
216	East Island Causeway	Lakeside Drive	Dead End	0.50	N	R	G	7.5			N	0-49	5.00	5.00	<b>5.00</b>
217	Fickes Road	County Road 2	Dead End	0.40	N	S	HCB	9		7	N	<b>50-199</b>	9.00	7.00	<b>6.00</b>
218	Chantime Drive	Dead End West	Dead End East	0.60	N	S	HCB	9		7	N	0-49	9.00	3.00	<b>5.00</b>
219	Structured Products Drive	County Road 2	Dead End	0.20	N	R	HCB	9		7	N		8.00	7.75	<b>7.00</b>
220	Six Smith Drive	County Road 2	Dead End	0.40	N	R	HCB	8		6	N	0-49	8.00	7.00	<b>6.00</b>
221	Warner Drive	Six Smith Drive	Dead End	0.45	N	R	HCB	7.3		6	N	0-49	8.00	6.75	<b>5.00</b>
222	Fran Lafran Drive	County Road 2	County Road 2	0.40	N	R	G	8			N		6.00	6.00	<b>6.00</b>
223	Algonquin Drive	County Road 2	Dead End	0.40	N	S	HCB	7		6	N	0-49	7.00	6.00	<b>6.00</b>
224	Saskatchewan Drive	Alonquin Avenue	Columbia Avenue	0.15	N	S	HCB	7		6	N	0-49	7.00	5.00	<b>6.00</b>
225	Columbia Avenue	Dead End, East	Thompson Drive	0.60	N	S	HCB	7		6	N	0-49	7.00	6.50	<b>6.00</b>
226	Thompson Drive	Dead End	County Road 15	0.20	N	S	HCB	7		6	N	0-49	7.00	5.75	<b>5.00</b>
227	Moss Drive	County Road 15	Jenkins Road	0.35	N	R	HCB	7		6	N	0-49	6.00	5.75	<b>6.00</b>
228	Jenkins Road	Dead End	County Road 15	0.30	N	S	HCB	7		6	N	0-49	6.00	6.00	<b>5.00</b>
229	Prieur Road	County Road 15	Dead End	0.10	N	R	G	7		6		0-49	6.00	6.00	<b>6.00</b>
230	Mack Street	Cornwall Center Road	Alguire Street	0.40	N	S	HCB	8		6			6.00	4.75	<b>4.50</b>
231	Alguire Street	Mack Street	Melba Street	0.50	N	S	HCB	8		6		0-49	7.00	4.75	<b>4.50</b>
232	Melba Street	Alguire Street	Marydale Avenue	0.25	N	S	HCB	8		6		0-49	7.00	5.50	<b>5.00</b>

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233	Sunnyview Avenue	Melba Street	Mack Street	0.50	N	S	HC	8		6		0-49	7.00	5.50	<b>5.00</b>
234	Virgina Street	Sunnyview Avenue	Dead End	0.20	N	S	HC	8		6		0-49	7.00	5.50	<b>5.00</b>
235	St. James Street	Sunnyview Avenue	Dead End	0.20	N	S	HC	8		6		0-49	7.00	5.50	<b>5.00</b>
236	Crystal Street	Sunnyview Avenue	Alguire Street	0.15	N	S	HC	8		6		0-49	7.00	5.50	<b>5.00</b>
237	Marydale Avenue	Dead End	Joseph Street	1.30	N	S	HC	8		6		<b>200-399</b>	6.00	5.50	<b>5.00</b>
238	Joseph Street	Marydale Avenue	Philip Street	0.30	N	S	HC	8		6		0-49	6.00	5.50	<b>5.00</b>
239	Philip Street	Dead End	Marydale Avenue	0.15	N	S	HC	8		6		0-49	6.00	5.50	<b>5.00</b>
240	Yolanda Street	Marydale Avenue	Dead End	0.35	N	S	HC	8		6		0-49	7.00	5.50	<b>4.50</b>
241	Daisy Street	Marydale Avenue	Rosedale Avenue	0.30	N	S	HC	8		6		0-49	6.00	5.50	<b>4.50</b>
242	Rosedale Avenue	Daisy Street	Jean Street	0.40	N	S	HC	8		6		0-49	6.00	4.50	<b>4.00</b>
243	Jean Street	Rosedale Avenue	Marydale Avenue	0.30	N	S	HC	8		6		50-199	7.00	5.50	<b>4.00</b>
244	Thomas Street	Jean Street	Daisy Street	0.40	N	S	HC	8		6		0-49	6.00	4.75	<b>4.50</b>
245	Bruce Street	Dead End	Cornwall Center Road	1.00	N	S	HC	8		6		<b>300-499</b>	6.00	4.75	<b>4.50</b>
246	Virgina Street	Highway 138	Bruce Street	0.15	N	S	HC	8		6		0-49	7.00	5.75	<b>5.00</b>
247	Marlyn Street	Highway 138	Bruce Street	0.15	N	S	HC	8		6		0-49	5.00	8.50	<b>7.00</b>
248	Stephen Street	Highway 138	Bruce Street	0.15	N	S	HC	8		6		0-49	5.00	8.50	<b>8.00</b>
249	Cheryl Street	Marydale Avenue	Highway 138	0.45	N	S	HC	8		6			7.00	4.75	<b>4.50</b>
250	Heather Crescent	County Road 18	Dead End	0.30	N	R	HC	7	20	6	N			7.00	<b>7.00</b>
251	Abigail Court	County Road 35	County Road 35	0.50	N	S	HC	9		7	N	0-49		9.00	<b>7.00</b>
252	Barry Street	Barnhart Drive	Dead End	0.10	N	S	HC	9		7	N	0-49		8.00	<b>7.00</b>
253	Walner Street	Barnhart Drive	Dead End	0.10	N	S	HC	9		7	N	0-49		8.00	<b>8.00</b>
254	Forest Hills Road	County Road 36	Fickes Road	0.90	N	S	HC	9		7	N	<b>200-399</b>		8.00	<b>8.00</b>
255	Hickory Street	Piercy Street	Dead End	0.10	N	S	HC	9		7	N	0-49		9.00	<b>9.00</b>
256	Cypress Lane	Hickory Street	Dead End	0.30	N	S	HC	9		7	N	0-49		8.00	<b>8.00</b>
257	Penny Lane	Thompson Drive	Columbia Avenue	0.30	N	S	HC	9		7	N	0-49		6.50	<b>5.00</b>
258	Grantley	Yolanda Street	Dead End	0.15			HC								<b>9.00</b>
259	Beech	Farron Drive	Ault Drive	0.40			HC							9.00	<b>9.00</b>
260	Primrose Lane	Columbia Avenue	Dead End	0.30			HC								<b>7.00</b>
261	Stratford Boulavard	Fickos Road	Dead End	0.20			HC								<b>9.00</b>
262	George Patrick Drive	Forest Hill Road	Dead End	0.35			HC								<b>9.00</b>

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
263	Comer Crescent	George Patrick Drive	Forest Hill Road	0.30			HCB								<b>9.00</b>
264	Jim Brownell Boulevard	County Road 36	Dead End	0.40			HCB								<b>9.00</b>
016A	Guindon	Highway 138	0.3km south of Hwy 138	0.50	N	R	G	7		5		0-49	4.00	4.00	<b>5.00</b>
016C	Cameron Road	Highway 138	Dead End	2.40	N	R	LCB	8.5	20		Y	0-49	9.00	5.00	<b>7.00</b>
040A	Pidgeon	Richmond Road	Dead End	0.20	N	R	G	7	20	5	N	0-49	5.00	5.00	<b>4.00</b>
040B	Atchenson Road	Richmond Drive	1.35km East of Richmond Drive	2.00	N	R	LCB	8.4	20	6.4	y	50-199	9.00	7.00	<b>8.00</b>
040C	Atchison Road	1.35km east of Richmond Drive	County Road 33	1.10	N	R	LCB	8.4	20	6.4	Y	50-199	7.00	6.00	<b>9.00</b>
068A	Windfall Road	County Road 35	2.5km northerly	2.60	N	R	LCB	7.5	20	6	Y		5.00	6.00	<b>9.00</b>
068B	Windfall Road	2.5km north of County Road 35	County Road 18	0.90	N	R	LCB	7.5	20	6	Y		5.00	6.00	<b>6.00</b>
074A	Northfield Road	Dixon Road	2.1km west of County Road 15	1.20	N	R	LCB	7	20	6	Y	200-399	4.00	6.50	<b>6.00</b>
074B	Northfield Road	2.1km west of County Road 15	County Road 15	2.10	N	R	LCB	7	20	6	Y	200-399	7.00	7.00	<b>9.00</b>
089A	Dafoe Road	Aultsville Road	1.2km east of Aultsville Road	1.20	N	R	HCB	7	20	6	Y	<b>100-299</b>	4.00	8.50	<b>8.00</b>
089B	Dafoe Road	1.2km east of Aultsville Road	2.1km west of County Road 14	2.70	N	R	HCB	7	20	6	Y		8.00	6.00	<b>4.00</b>
089C	Dafoe Road	County Road 14	2.1km west of County Road 14	2.10	N	R	HCB	7	20	6	Y		4.00	5.00	<b>4.00</b>
096A	Rombough Road	County Road 18	Pleasant Valley Road	1.10	N	R	HCB	7.5		6	Y	<b>50-199</b>	8.00	6.00	<b>4.00</b>
096B	Rombough Road	County Road 18	Dead End	1.40	N	R	E				N	0-49	1.00	1.00	<b>1.00</b>
100A	Elijh/Beckstead Road	0.9km East of County Road 11	2.0km East of Couty Road 11	2.10	N	R	LCB								<b>7.00</b>
102A	Bruning Road	Elijh/Beckstead Road	0.4km North	0.40	N	R	LCB	7			Y		7.00	6.50	<b>4.00</b>
102B	Bruning Road	0.4km north of Elijh/Beckstead Road	Hart Road	1.80	N	R	G	6.5			Y		7.00	7.00	<b>6.00</b>
105A	Morgan Road	County Road 18	Duffy's Road	0.30	N	R	LCB	7.5		6	Y	<b>200-399</b>	3.00	5.50	<b>4.00</b>
105B	Morgan Road	Duffy's Road	Dafoe Road	2.00	N	R	LCB	7.5		6	Y	<b>200-399</b>	3.00	6.00	<b>5.00</b>
109A	Bush Glen Road	County Road 11	0.4km west of Hart Road	4.20	N	R	G	7			Y		7.00	7.00	<b>7.00</b>
109B	Bush Glen Road	0.4km west of Hart Road	Hart Road	0.40	N	R	LCB	7			Y		7.00	3.00	<b>9.00</b>
110A	May Road	Hunters Road	0.70 km South of Hunters Road	0.70	N	R	HCB				Y	<b>50-199</b>	4.00	7.00	<b>4.00</b>
110B	May Road	0.70 km south of Hunters Road	Trillium Road	1.30	N	R	LCB				Y		7.00	3.50	<b>9.00</b>
110C	May Road	Trillium Road	Bush Glen Road	1.50	N	R	LCB				Y		4.00	7.00	<b>8.00</b>
111A	Sandtown Road	County Road 12	1.5km west of County Road 12	1.50	N	R	LCB	7		6	Y	50-199	3.00	6.50	<b>7.00</b>
111B	Sandtown Road	1.5km west of County Road 12	May Road	1.90	N	R	LCB	7		6	Y	50-199	3.00	6.00	<b>4.00</b>
118A	Allen Road	County Road 11	Lalonde Road	1.10	N	R	G	6			N	0-49	6.00	6.00	<b>6.00</b>
118B	Allen Road	Lalonde Road	Nine Mile Road	1.40	N	R	E	4			N	0-49	2.00	2.00	<b>2.00</b>

## 2016 ROAD APPRAISALS - TOWNSHIP OF SOUTH STORMONT

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	PLAT. WIDTH	SURF WIDTH	R.O.W. WIDTH	SCHOOL BUS ROUTE	TRAFFIC RANGE	CONDITION RATING IN 2003	2011 CONDITION RATING	2016 CONDITION RATING
123A	Aultsville Road	County Road 18	1.0km south of County Road 18	1.00	N	R	LCB	9		9	Y		6.00	5.00	<b>3.00</b>
123B	Aultsville Road	County Road 2	1.6km north of County Road 2	1.60	N	R	HCB	9		9	Y	<b>200-399</b>	4.00	8.00	<b>8.00</b>
123C	Aultsville Road	1.6km north of County Road 2	1.0km south of County Road 18	2.30	N	R	HCB	9		9	Y	<b>200-399</b>	4.00	9.00	<b>8.00</b>
124A	North Lunenburg Road West	0.8km east of County Road 14	0.9km west of County Road 12	4.40	N	R	LCB	7.5		6	Y	200-399	7.00	8.00	<b>6.00</b>
124B	N. Lunenburg Road, West	0.9km west of County Road 12	County Road 12	0.90	N	R	HCB	7.5		6	Y	200-399	7.00	5.50	<b>8.00</b>
124C	North Lunenburg Road West	County Road 14	0.8km east of County Road 14	0.80	N	R	HCB	7.5		6	Y	200-399	7.00	5.50	<b>4.00</b>
133A	Finch-Osnabruk Boundary	County Road 12	Dead End (west)	2.00	N	R	G	6.5			Y	0-49	5.00	5.00	<b>5.00</b>
133B	Finch-Osnabruk Boundary	County Road 12	Dead End (east)	0.40	Y	R	G	6			Y	0-49	6.00	6.00	<b>6.00</b>
134A	Waldroff Road	County Road 12	County Road 12	3.60	N	R	G	6.8			Y	<b>0-49</b>	6.00	6.00	<b>6.00</b>
135A	Finch-Osnabruk Boundary	Dead End	St. Luke's Road	1.00	Y	R	G	6			Y	0-49	4.00	4.00	<b>4.00</b>
135B	Finch-Osnabruk Boundary	St. Luke's Road	County Road 14	0.70	Y	R	G	8			Y	0-49	7.00	7.00	<b>7.00</b>
174A	Pine Street	Ault Street	Ault Street	0.70	N	S	HCB	9		7	N	0-49	7.00	4.50	<b>8.00</b>
174B	Wildwood Street	Ault Street	Dead End	0.15	N	U	HCB			7.5	N	0-49	7.00	5.75	<b>6.00</b>
179A	Industrial Street	45th Parrallel	North Corner	0.30	N	S	G								<b>7.00</b>
197A	Mille Roches Road	Cherry Street	French Avenue	0.17	N	S	G					<b>999+</b>			<b>7.00</b>
208A	Long Sault Drive	County Road 35	Plaza Street	0.10	N	S	HCB			7	N		4.00	8.00	<b>8.00</b>
208B	Long Sault Drive	Plaza Street	County Road 2	0.20	N	S	HCB			7	N		8.00	8.00	<b>3.00</b>



## APPENDIX C – FORECAST CONDITION RATING

# 10 YEAR CAPITAL PLAN - LCB

Condition Rating Adjusted to account for 2016 Capital Works  
 Condition Rating Adjusted to account for 2017 - 2026 Capital Works

No.	STREET	FROM	TO	Km	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
004	Island Road	Delaney Road	Edge of South Glengarry Boundary	2.20	4.00	3.53	3.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00	
005	Delaney Road	County Road 18	0.15 km of Island Road	1.00					9.00	8.53	8.06	7.59	7.12	6.65	6.18	
006	Delaney Road	0.15 km of Island Road	North Branch Road	2.20	7.00	6.53	6.06	5.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
011	North Branch Road	South Glengarry Boundary	Delaney Road	1.80	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	6.77	6.30	
013	McPhail Road	0.4km west of Delaney Road	2.8km west of Delaney Road	2.80	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30	
016C	Cameron Road	Highway 138	Dead End	2.40	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30	
017	Amell Road	Highway 138	Dead End	1.90	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00	
040B	Atchenson Road	Richmond Drive	1.35km East of Richmond Drive	2.00	8.00	7.53	7.06	6.59	6.12	5.65	5.18	6.71	6.24	5.77	5.30	
040C	Atchison Road	1.35km east of Richmond Drive	County Road 33	1.10	9.00	8.53	8.06	7.59	7.12	6.65	6.18	7.71	7.24	6.77	6.30	
044	MacMillan Corners Road	Highway 138	Edge of North Stormont Boundary	0.90	5.00	4.53	4.06	3.59	3.12	9.00	8.53	8.06	7.59	7.12	6.65	
046	Willy Allan Road	3.5km west of Hwy 138	County Road 15	5.40											9.00	
052	Lawson Road	Maloney Road	Myers Road	2.30					9.00	8.53	8.06	7.59	7.12	6.65	6.18	
065	Valade Road	Highway #138	County Road 18	3.10	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	6.30	
068A	Windfall Road	County Road 35	2.5km northerly	2.60	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	6.30	
068B	Windfall Road	2.5km north of County Road 35	County Road 18	0.90	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	9.00	
073	Eamer Road	1.6km east of North Field Road	County Road 15	1.40	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30	
074A	Northfield Road	Dixon Road	2.1km west of County Road 15	1.20	6.00	5.53	5.06	4.59	4.12	3.65	3.18	9.00	8.53	8.06	7.59	
074B	Northfield Road	2.1km west of County Road 15	County Road 15	2.10	9.00	8.53	8.06	7.59	7.12	6.65	6.18	7.71	7.24	6.77	6.30	
076	Dixon Road	Northfield Road	MacRae Road	0.65	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
077	Dixon Road	MacRae Road	County Road 12	2.80	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
080	North Lunenburg Road East	County Road 12	Northfield Road	1.90	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
087	Eaman Road	County Road 12	1.7km west of County Road 12	1.70	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	9.00	8.53	
088	Eaman Road	1.7km west of County Road 12	County Road 14	3.50	4.00	3.53	3.06	2.59	2.12	2.00	2.00	2.00	2.00	9.00	8.53	
097	Rombough Road	Pleasant Valley Road	Elijh/Beckstead Road	2.30	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30	
098	Neville Road	Rombough Road	County Road 14	2.00	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30	
100	Elijh/Beckstead Road	County Road 14	2.0km East of County Road 11	1.30	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30	
100A	Elijh/Beckstead Road	0.9km East of County Road 11	2.0km East of County Road 11	2.10	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
101	Elijh/Beckstead Road	3.5 km West of County Road 14	County Road 11	0.90	7.00	6.53	6.06	5.59	5.12	4.89	4.42	3.95	3.48	3.01	2.54	
104	Duffy's Road	County Road 14	Morgan Road	1.20	3.50	3.03	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	
105A	Morgan Road	County Road 18	Duffy's Road	0.30	4.00	3.77	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	
105B	Morgan Road	Duffy's Road	Dafoe Road	2.00	5.00	4.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30	
106	North Valley Road	Otto Road	Elijh/Beckstead Road	2.80	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	6.77	6.30	
109B	Bush Glen Road	0.4km west of Hart Road	Hart Road	0.40	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
110B	May Road	0.70 km south of Hunters Road	Trillium Road	1.30	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
110C	May Road	Trillium Road	Bush Glen Road	1.50	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30	
111A	Sandtown Road	County Road 12	1.5km west of County Road 12	1.50	7.00	6.53	6.06	5.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
111B	Sandtown Road	1.5km west of County Road 12	May Road	1.90	4.00	3.53	3.06	2.59	9.00	8.53	8.06	7.59	7.12	6.65	6.18	
113	Otto Road	County Road 14	May Road	3.20	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	5.77	5.30	
115	Hunters Road	County Road 12	County Road 11	8.00	4.00	3.53	3.06	2.59	2.12	6.50	9.00	8.53	8.06	7.59	7.12	
123A	Aultsville Road	County Road 18	1.0km south of County Road 18	1.00	3.00	2.53	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	
124A	North Lunenburg Road West	0.8km east of County Road 14	0.9km west of County Road 12	4.40	6.00	5.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30	
145	Stuart Road	Manning Road	Dead End	0.10	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30	
169	Shaver Road	Colonial Road	0.7 km North	0.70	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30	
<b>WEIGHTED AVERAGE CONDITION RATING</b>					<b>6.81</b>	<b>6.34</b>	<b>6.24</b>	<b>5.83</b>	<b>5.76</b>	<b>5.85</b>	<b>5.70</b>	<b>5.47</b>	<b>5.02</b>	<b>5.21</b>	<b>5.25</b>	
<b>TOTAL KILOMETRES</b>					<b>78.45</b>	<b>78.45</b>	<b>78.45</b>	<b>78.45</b>	<b>81.75</b>	<b>81.75</b>	<b>81.75</b>	<b>81.75</b>	<b>81.75</b>	<b>81.75</b>	<b>81.75</b>	<b>86.75</b>





No.	STREET	FROM	TO	Km	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
242	Rosedale Avenue	Daisy Street	Jean Street	0.40	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
243	Jean Street	Rosedale Avenue	Marydale Avenue	0.30	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
244	Thomas Street	Jean Street	Daisy Street	0.40	4.50	4.27	4.04	3.81	3.58	3.35	3.12	2.89	2.66	2.43	2.20
245	Bruce Street	Dead End	Cornwall Center Road	1.00	4.50	4.27	4.04	3.81	3.58	3.35	3.12	2.89	9.00	8.77	8.54
246	Virginia Street	Highway 138	Bruce Street	0.15	5.00	4.77	4.54	4.31	4.08	3.85	3.62	3.39	3.16	2.93	2.70
247	Marilyn Street	Highway 138	Bruce Street	0.15	7.00	6.77	6.54	6.31	6.08	5.85	5.62	5.39	5.16	4.93	4.70
248	Stephen Street	Highway 138	Bruce Street	0.15	8.00	7.77	7.54	7.31	7.08	6.85	6.62	6.39	6.16	5.93	5.70
249	Cheryl Street	Marydale Avenue	Highway 138	0.45	4.50	4.27	4.04	3.81	3.58	3.35	3.12	2.89	9.00	8.77	8.54
250	Heather Crescent	County Road 18	Dead End	0.30	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
251	Abigail Court	County Road 35	County Road 35	0.50	7.00	6.77	6.54	6.31	6.08	5.85	5.62	5.39	5.16	4.93	4.70
252	Barry Street	Barnhart Drive	Dead End	0.10	7.00	6.77	6.54	6.31	6.08	5.85	5.62	5.39	5.16	4.93	4.70
253	Walner Street	Barnhart Drive	Dead End	0.10	8.00	7.77	7.54	7.31	7.08	6.85	6.62	6.39	6.16	5.93	5.70
254	Forest Hills Road	County Road 36	Fickes Road	0.90	8.00	7.77	7.54	7.31	7.08	6.85	6.62	6.39	6.16	5.93	5.70
255	Hickory Street	Piercy Street	Dead End	0.10	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
256	Cypress Lane	Hickory Street	Dead End	0.30	8.00	7.77	7.54	7.31	7.08	6.85	6.62	6.39	6.16	5.93	5.70
257	Penny Lane	Thompson Drive	Columbia Avenue	0.30	5.00	4.77	4.54	4.31	4.08	3.85	3.62	3.39	3.16	2.93	2.70
258	Grantley	Yolanda Street	Dead End	0.15	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
259	Beech	Farron Drive	Ault Drive	0.40	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
260	Primrose Lane	Columbia Avenue	Dead End	0.30	7.00	6.77	6.54	6.31	6.08	5.85	5.62	5.39	5.16	4.93	4.70
261	Stratford Boulevard	Fickos Road	Dead End	0.20	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
262	George Patrick Drive	Forest Hill Road	Dead End	0.35	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
263	Corner Crescent	George Patrick Drive	Forest Hill Road	0.30	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
264	Jim Brownell Boulevard	County Road 36	Dead End	0.40	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16	6.93	6.70
<b>WEIGHTED AVERAGE CONDITION RATING</b>					<b>5.67</b>	<b>5.50</b>	<b>5.45</b>	<b>5.39</b>	<b>5.36</b>	<b>5.44</b>	<b>5.29</b>	<b>5.42</b>	<b>5.54</b>	<b>5.46</b>	<b>5.37</b>
<b>TOTAL KILOMETERS</b>					<b>111.40</b>	<b>112.47</b>	<b>113.12</b>	<b>114.27</b>	<b>114.27</b>	<b>114.27</b>	<b>115.77</b>	<b>115.77</b>	<b>115.77</b>	<b>115.77</b>	<b>115.77</b>