2022

THE TOWNSHIP OF SOUTH ALGONQUIN

2022 ROAD INVENTORY AND CONDITION ASSESSMENT

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REVISIONS		
No.	**Date**	**Revisions**
0	May 4, 2022	First draft of final report
1	May 10, 2022	Revisions based on comments from the Township (road conditions)
2	May 12, 2022	Revisions based on comments from the Township (traffic volumes)
3	May 13, 2022	Revisions based on comments from the Township (general)
4	May 13, 2022	Revisions based on comments from the Township (general)
5	June 23, 2022	Revisions based on comments from the Township
6	June 29, 2022	Revisions based on comments from the Township
7	June 29, 2022	Revisions based on comments from the Township
8	June 29, 2022	Revisions based on comments from the Township
9	July 20, 2022	Revisions based on comments from the Township

Executive Summary

The 2022 Township of South Algonquin Road Inventory Condition Assessment summarizes the road system survey completed in the fall of 2021 and spring of 2022. The study identifies the roads based on their, current condition and proposed reconstruction or rehabilitation strategy.

Data collection and road ratings were done generally in accordance with the Ministry of Transportation (MTO) Inventory Manual for Municipal Roads (1991) (the *"Manual"*).

The purpose of the study is to provide an overview of the condition of the road system with each road section being evaluated on several factors which contribute to the overall condition of the system. The physical condition of the road is an empirical evaluation based on structural adequacy, current surface condition and improvement history. The total performance of the system also considers drainage, geometrics, road classification, roadside environment, and traffic volumes.

Accurate traffic volumes play an important role in classifying the roads and assessing their overall performance and identifying existing deficiencies. It is recommended that the Township implement an annual traffic counting program in order to ensure compliance with Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) with respect to patrolling and maintenance requirements. Accurate traffic counts are also important to ensure that road sections are constructed to meet the expected service levels. Historical and future growth within the Township were reviewed. Based on available information, it was decided that future growth would not be significant and this has been accounted for in recommended improvements.

A complete review of the geometrics of each road section is outside the scope of this assignment. It should be noted that estimated costs for reconstruction or rehabilitation are based on improving the road sections with their current horizontal and vertical alignments. Recommended improvements are determined through information collected in the field and based on recommendations of the Manual. Improvements set out in the Manual are general in nature as the original purpose was to apply the same standard to all municipalities in Ontario. Items included in the reconstruction or rehabilitation strategies set out in the Manual may not be applicable to the Township of South Algonquin. It is expected that details of any reconstruction or rehabilitations will be reviewed during the detailed design process of any capital or maintenance improvements.

Several road conditions are reviewed and rated in the field. This information was then used to calculate the Condition Rating of each road section and determine the need for rehabilitation or reconstruction. Deficiencies categorize each road section as 'Adequate', 'Now', '(1-5)', or '(6-10)'.

The *Manual* notes that rural roads with an average annual daily traffic (AADT) volume of less than fifty (50) shall be considered adequate as low volume roads even if they have an identified need. These roads have been given proposed rehabilitation or reconstruction strategies, but these deficiencies should be addressed with normal maintenance procedures. The traffic volumes for 20 road sections were measured in 2021 and the remaining traffic volumes were estimated based on proximity to the measured sections.

Benchmark costs are based on standard items recommended in the *Manual* and derived from unit price contracts within and around the Township. Unit rates were refined further based on discussions with township staff. The estimated total cost of improvements to the road network is $20,171,000.00 including low volume roads.

The *Manual* prioritizes road sections largely based on their current condition and traffic volumes. As a result, roads that are in poor condition are given a high priority (worst first) as are roads with higher traffic volumes. Current industry practice has shifted towards prioritizing preservation over reconstruction. It is recognized in the industry that the proper treatment at the proper time extends the life cycle of any municipal asset. There are several preservation operations that can be undertaken, such as crack sealing and micro surfacing, and the Township must decide which are best suited to meet the needs of the Township. It is recommended that the Township carry whatever annual budget can be afforded for this purpose.

Of the identified needs, $3,306,000 is for roads that are already deficient ('NOW'). As low volume roads are considered adequate, costs for these roads have been excluded.

Based on the identified needs of the Township, budget recommendations for annual preservation programs have been developed as follows:

- $198,000 annually on hot mix resurfacing based on a 15 year cycle
- $205,000 annually on single surface treatment based on a 7 year cycle
- $370,000 annually for gravel resurfacing based on a 3 year cycle
- $15,000 annually for crack sealing

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1.0 Introduction

The road network in a typical single tier municipality represents the single largest investment for the municipality and the taxpayers who support the road system.

The largest annual expenditure that a small urban or rural municipality will make will be on their road system. Typically, this includes everything from staff and equipment to seasonal maintenance to capital construction improvements.

A typical road budget for the average small municipality should allow for the ongoing maintenance needs of the road network, including bridges, in conjunction with relatively minor capital construction improvements. Most municipalities cannot afford larger capital projects without the assistance of government funding.

As a result of provincial requirements introduced in the fall of 2012, municipalities seeking funding from the federal and provincial government to assist in the completion of capital projects must have prepared an Asset Management Plan (AMP). The Township of South Algonquin retained the services of Jewell Engineering Inc. to carry out a Roads Inventory and Condition Assessment of the township road system for inclusion in the Township's AMP. The roads assessment will provide the Township with a current physical evaluation of road assets and allow staff to develop short- and long-term capital and maintenance programs.

2.0 Background

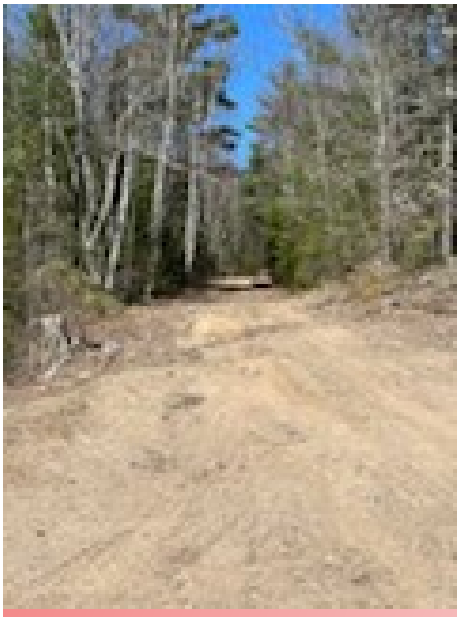
All township roads were reviewed and have been included in this report. The study will assist the Township in identifying the physical and financial needs of the road network with respect to the recommended improvements to the road network within the 10-year horizon.

The township road system consists of approximately 122.09 centreline kilometres of hard and loose topped roads built and maintained for the purposes of moving traffic, people, goods, and services throughout the Township. The Township of South Algonquin completes the majority of capital improvements and all roadside maintenance using their own forces. Contractor support is used for paving and surface treatment operations.

3.0 Objectives

The primary objectives of this study were to;

- Provide an overview of the entire municipal road network and the individual sections that make up the system in a form that will allow the Township to objectively consider the needs of each section as identified in the assessment
- Provide an assessment of the condition of the municipal road system through an established rating system and an evaluation of defined parameters for each of the sections of the road system
- Provide recommended rehabilitation and reconstruction strategies for all road sections based on available information, Minimum Maintenance Standards, Municipal guidelines and standards and current industry standards and methodologies
- Provide the Township with options related to the management of the road system and allow municipal staff to develop short (Now), mid (1-5 years) and long (6-10 years) term capital and maintenance programs based on the needs of the road network and in the best interest of public health and safety
- Provide cost estimates for the required rehabilitation or reconstruction of municipal assets based on appropriate benchmark costing



4.0 Report Content and Scope

This report was prepared by Jewell Engineering Inc. for the Township of South Algonquin. Road assessments are based on the criteria prescribed in the Ministry of Transportation Inventory Manual for Municipal Roads (1991) (the '*Manual*').

The scope of the report includes summaries of the data collected along with discussion and analyses of the same.

All the Township's roads were reviewed and have been included in this report. The study will assist the Township in identifying physical and financial needs with respect to the recommended improvements to the road network within the 10-year horizon.

Traffic volumes were measured in 2021 and 2022 for 20 road sections. The remaining road sections were estimated based on proximity to the measured road sections and discussion with Township staff. Discretion should be exercised in using these volumes to establish road classifications under Minimum Maintenance Standards. The Township will assume some risk in classifying roads based on theoretical traffic volumes.

Population growth is typically applied to recommended improvements. However, discussion with staff indicates that the Township of South Algonquin's growth potential may be affected by issues beyond the control of the Township. For this reason, the population increase within the Township over the last 10 years has been very little to no growth.

5.0 Asset Condition Rating Methodology

5.1 Asset Condition Rating Methodology

The most recent Inventory Manual for Municipal Roads was published in 1991 and replaced the Municipal Roads Appraisal section of the Inventory Manual – Municipal Roads and Railway Level Crossings dated August 1988.

The purpose of the Manual is to;

- Assist in the appraisal of municipal roads
- Provide municipalities with additional information to effectively manage their road needs
- Identify additional engineering studies that may be required
- Identify rehabilitation or reconstruction strategies
- Develop cost estimates for rehabilitation or reconstruction strategies

The roads assessment was done through the completion of the following steps;

i. Field review and inventory of current road system
ii. Preparation of preliminary condition assessment
iii. Discussions with the Township
iv. Identification of the needs of the road system
v. Review and update of construction unit prices
vi. Preparation of final condition assessment report

5.2 Field Review and Inventory of Current Road System

Field review of the road network is a subjective process. Critical characteristics of the road are rated on a numeric scale out of 10, 15 or 25 depending on how important the quality is deemed to be as it relates to the performance of the road. To assist in mitigating the subjective nature of the evaluations, the *Manual* provides ranges for each condition rather than a specific value for a condition.

The *Manual* uses six (6) categories to determine the timing of the needs of each road section. These include Geometrics, Structural Adequacy, Surface Type, Surface Width, Capacity and Drainage. Considered in conjunction with the field assessment and traffic volumes, these critical components assist in determining when and what strategy is to be implemented for each road section. Timing provided is for

reconstruction and is an estimate of the remaining service life of the road section if remedial action is not taken. Specified time frames identify as 'ADEQUATE', 'NOW', Within (1-5) Years ['(1-5)'] or Within (6-10) Years ['(6-10)'].

Although a road section may have an identified need, the *Manual* suggests that rural road sections with an AADT of less than fifty (50) be considered adequate with normal maintenance procedures. For this reason, along with O. Reg 239/02, it is recommended that the Township implement an annual traffic counting program in order to ensure service levels are maintained.

Roads with an identified 'NOW' need essentially represent the municipal road infrastructure deficit, roads that require reconstruction or major rehabilitation. The existing condition is less than the minimum tolerable standard. In theory, these road sections should undergo the suggested improvements immediately but the reality is most municipalities cannot afford the cost.

Road sections with an identified need and timing of '(1-5)' are expected to have a need that falls below the minimum tolerable standard within the next 5 years. Proposed improvements should be implemented within the 1 to 5-year horizon.

Road sections with an identified need and timing of '(6-10)' are expected to have a need that falls below the minimum tolerable standard within 10 years. The proposed improvements should be implemented within the 6 to 10-year horizon.

Road sections deemed Adequate have no identified needs. These roads are expected to meet or exceed the minimum tolerable standard for the 10-year study period.

5.3 Condition Assessment

5.3.1 Roadside Drainage

Evaluation of drainage systems, including storm sewer systems, is largely based on historical data and the condition of any existing underground infrastructure. As little to no historical information was available regarding flooding within the urban centres, (Whitney and Madawaska) and a closed-circuit television inspection of the storm sewers was not completed, drainage along urban roads was assumed to be present and satisfactory. Township staff did not identify any concerns with the function of storm sewer systems.

Drainage for road sections within the semi-urban and rural areas of the Township is provided primarily through open ditches. The topography and terrain within the Township have resulted in intermittent ditching in many road sections.

Discussion with the Township identified three road sections that are subject to seasonal flooding and must be closed to traffic until water levels recede. The Township estimates that the road in areas prone to seasonal flooding should be raised approximately 600mm to prevent overtopping. Otherwise, the Township did not identify any concerns with the rural drainage systems.

5.3.2 Maintenance Demand

The *Manual* also includes a rating for the maintenance demand for each road section. While some road sections may require less maintenance, in the absence of information to the contrary, it is reasonable to assume all road sections require regular or average levels of maintenance. Values assigned to road sections for maintenance demand are reflective of average maintenance requirements. Reduced values have been assigned to road sections which require an excessive level of maintenance. These roads have been identified through discussions with the Township.

5.3.3 Capacity and Level of Service

Capacity and Level of Service are related to the traffic volumes and the design hour volume (DHV). For rural road sections with a DHV of less than 1200, the level of service component is not applicable and the road section is instead reviewed based on the geometrics (horizontal and vertical alignment). Based on available information, there are no rural road sections within the Township network with a DHV greater than 1200.

For semi-urban and urban road sections with a DHV less than 1200, the *Manual* assumes the level of service is adequate. Therefore, road sections meeting this criterion have been given the maximum value for Level of Service.

Based on the foregoing, the township road network is understood to have adequate capacity and the study does not provide further comment on Capacity.

5.3.4 Horizontal and Vertical Alignment

A complete analysis of the horizontal and vertical components of each road section is outside the scope of this study due to budgetary constraints.

The absence of any commentary on the geometrics of the township road network should not be construed as an indication that there are no roads with substandard geometry. It is recommended that the Township compile a list of horizontal and vertical curves that may be of concern so further investigation can be completed.

5.3.5 Road Sections

Generally, a road network is composed of road sections that are consistent throughout their length based on characteristics such as surface type, roadside environment, or speed limit. Even with consistency in section attributes, it is reasonable to break longer road sections into shorter, more manageable, lengths. Long road sections are difficult to evaluate as the severity and density of distresses in the road can vary widely over a greater distance.

The financial constraints of the Township make it highly unlikely that urban road sections longer than 2.5km or rural roads longer than 5.0km can be constructed in the course of one construction

season. Keeping an inventory of long road sections, reconstructed over several years, will result in differential deterioration of the road section and make it difficult to assess the performance of the road section.

If the road is to be reviewed as one section, it may be deemed to meet minimum requirements when large sections do not. Likewise, a section may be deemed to be below minimum tolerable standards when large sections of the road are in good condition. The former puts the Township at risk while the latter may result in unnecessary expenditures.

5.3.6 Right-of-Way Width

Right-of-way width is also a component of the review. The width of the existing rights-of-way were not measured and are unknown. The Township has noted that many of the township roads are forced/trespass or shoreline roads. This greatly limits the Township's ability to properly maintain or improve these road sections although the roads do not appear to be adversely affected. Acquiring a 20m (66') road allowance, where possible and practical, would be beneficial for maintenance, improvements and in future planning and development.

5.4 Types of Improvements

Determination of improvements to a road section is largely based on the performance of the road as a whole. Consideration must be given to existing drainage and the improvement history, specifically type and timing of recent improvements, of the road section when assessing the structural adequacy of the underlying road base and subbase.

For this reason, it is important that the Township maintain accurate records of improvements made to any road section in their network to assist in future assessments of their road network.

Structural problems would lean toward reconstruction or replacement strategies while age related distresses would be better suited to rehabilitation strategies such as resurfacing. Proper assessment of the condition of the road is critical as determination of a suitable rehabilitation or reconstruction will ensure the Township is effectively distributing their financial resources.

Possible improvements include:

(R1)	-	Basic Resurfacing, Single Lift of Hot Mix 50mm or Surface Treatment
(R2)	-	Basic Resurfacing, Double Lift of Hot Mix 100mm
(RM)	-	Major Resurfacing, Double Lift of Hot Mix 100mm
(PR1)	-	Pulverize and Resurface, Single Lift of Hot Mix 50mm
(PR2)	-	Pulverize and Resurface, Double Lift of Hot Mix 100mm
(MP)	-	Mill and Pave
(BS)	-	Base and Surface
(RW)	-	Resurface and Widen
(REC)	-	Reconstruction (Rural and Semi Urban)
(RNS)	-	Reconstruction Nominal Storm Sewers (Urban)
(RSS)	-	Reconstruction with Storm Sewers

Other maintenance operations noted in the report include;

(SD)	-	Spot drainage repairs
(SR)	-	Spot Road repairs
(CS)	-	Crack Seal/Rout and Seal

It is important to appreciate the date the Manual was last published and the changing perspective on how municipal road assets should be managed. Municipalities are trending away from a 'worst first' approach and moving towards preservation of their linear assets. It is recognized in the industry that the proper treatment at the proper time extends the life cycle (Table 2) of any municipal asset and while the improvements in the Manual address renewal, technology has changed significantly since 1991. There are currently many preservation options available that the Manual does not consider which may be practical for the Township of South Algonquin. Discussions with township staff and a review of municipal roads indicate that the Township does have some level of preservation included in the road management program.

6.0 Road Structure

Every road is designed to last for a specific number of years. Generally, it is accepted that properly constructed roadways will have a life span of approximately 50 years with surface rehabilitation depending on the surface type. High class bitumen (HCB) or asphalt will provide a high riding quality for between 12 and 16 years before needing to be resurfaced. A road surface of Low-Class Bitumen (LCB) or surface treatment will provide a high riding quality for 6 to 10 years before needing to be resurfaced. The performance of both pavement types depends greatly on the traffic loading to which the roads are subjected. Road deterioration, pavement deterioration in particular, begins at a relatively slow pace for a newly constructed road. Over time, as the road is subjected to vehicular loading, distresses begin to manifest in the road surface. Distress in the road surface accelerates the deterioration as surface water penetrates more readily into the road base and subbase.

6.1 Road Components

Roads are layered structures of selected and processed materials which have been designed to resist wear, support wheel loads, and provide drainage. The conventional road structure consists of layers of subbase, base, and surface which are placed on a subgrade to support traffic load and distribute it to the roadbed. The highest loading on a road section occurs at the point where vehicle tires contact the road surface. It is critical that the pavement be designed to effectively transmit the vehicle loads to the road subgrade and that the road subgrade is capable of handling the load being transferred. Therefore, materials with greater strength are required higher in the road structure (at the surface) with materials with lesser strength being used deeper (further from the surface) in the road structure. Extremely poor-quality subgrade would require a larger depth of high strength material in the road structure.

6.2 Drainage

Road performance is determined, in large part, by drainage, both surface and internal. Surface drainage is influenced by the characteristics of the road such as crossfall and surface permeability. Internal drainage in affected by surface permeability, the granular materials used in the road structure and crossfall of the subbase and base layers.

The two primary sources of water in a road structure are surface infiltration and groundwater. Surface infiltration occurs through cracks in the road surface as well as through granular shoulders. Groundwater

seepage into road subgrade can occur through the combination of a high-water table and capillary action. The presence of water in a road structure can influence road performance by reducing the strength and durability of the materials.

6.3 Service Life and Road Maintenance

Road maintenance begins immediately after a road is constructed and takes one of three forms; preventive, routine or corrective. Figure 5 shows the typical deterioration of a pavement over its service life.

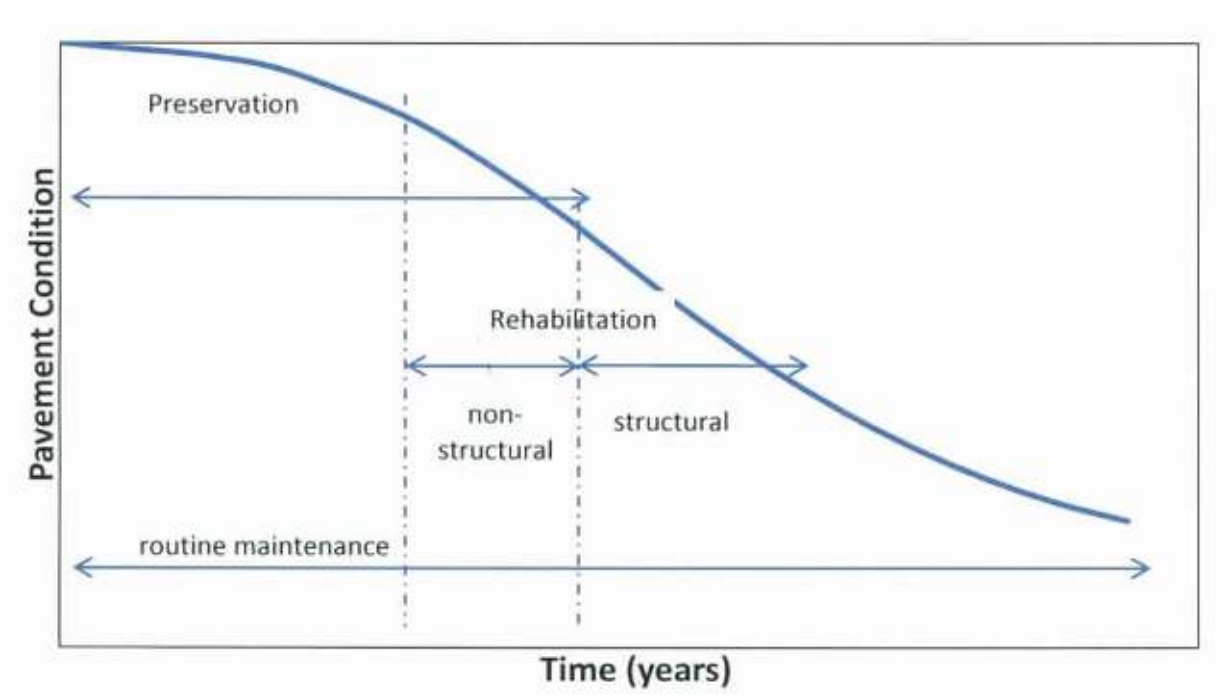


Figure 1 - Typical Pavement Deterioration and Timing of Pavement Treatments (Transportation Association of Canada Pavement Asset Design and Management Guide)

6.3.1 Maintenance

General roadway maintenance considers road components within the right-of-way and includes activities such as shoulder grading, roadside mowing, crack sealing and erosion control. Completion of these tasks improve the performance of the road. Ideally, these activities are completed proactively in order to prevent problems from occurring.

Routine maintenance is generally considered a reactive process that includes inexpensive, localized work that can be completed by municipal forces. This would include such tasks as pothole repairs, drainage improvements, and shallow patching.

The Township does undertake annual maintenance on the road network. The extent of work completed is dependent on budget and includes strategies such as;

- Spot improvements to the wearing surface and patching
- Spot drainage improvements and shoulder grading
- Roadside mowing and brushing

The Township logs municipal road allowances which has several benefits. Clearing trees from within the road allowance allows the road better access to the sun, reducing winter maintenance issues, provides space for improvements and increases driver safety. In addition, revenue from logging operations helps offset municipal operating costs.

6.3.2 Preservation

Preservation activities include work such as crack sealing, functional milling and resurfacing, and overlays and are generally expected to service the road for anywhere from five to ten years.

6.3.3 Rehabilitation

Rehabilitation strategies are required when additional preservation measures are no longer cost effective due to the pavement condition. These activities include resurfacing, cold in-place recycling and full depth reclamation.

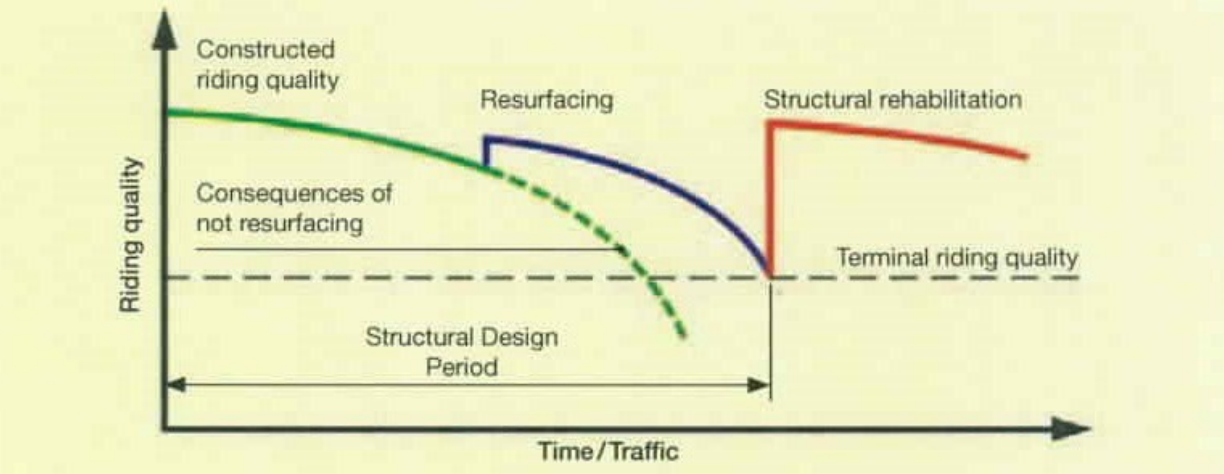


Figure 2 - Impact of Proper Maintenance on Road Service Life (Wirtgen Cold Recycling Technology Manual)

Figure 2 illustrates the effectiveness of timely maintenance, preservation and rehabilitation to ensure road sections reach their maximum service life prior to needing a full depth reconstruction. It is also

important to recognize that the service life (Time/Traffic) would be much shorter for an improperly constructed road as a result of accelerated deterioration due to an inadequate pavement design.

7.0 Road System Inventory & Classification

7.1 Surface Type and Roadside Environment

The road network within the Township of South Algonquin would be considered a Rural single tier road system.

The Manual includes the following definitions for roadside environment;

Rural – Areas with sparse development or where development is less than 50% of the frontage, including developed areas extending less than 300 metres on one side or 200 metres on both sides and no curb and gutter.

Semi-Urban (Suburban) – Development exceeds 50% of the frontage for a minimum of 300 metres on one side or 200 metres on both sides

AND

No curbs and gutters, with or without storm/combination sewers or curb and gutter on one side only without storm/combination sewers

or

For subdivisions, the majority of the lot frontages are 30 metres or greater and the roads comply with minimum road standards.

Urban – Curb and gutters on both sides with or served by storm/combination sewers

or

Curb and gutter on one side with or served by storm/combination sewers

or

Reversed paved shoulders with or served by storm/combination sewers

or

For subdivisions, the majority of the lot frontages are less than 30 metres

Table 1 identifies the length of road by Roadside Environment.

Table 1 – Breakdown by Roadside Environment

Roadside Environment	Length (km)	Percentage of System
Rural (R)	110.40	90.43%
Semi-Urban (S)	10.76	8.81%
Urban (U)	0.93	0.76%
Total	**122.09**	**100.00%**

Table 2 breaks the road network into lengths by surface type.

Table 2 – Road Breakdown by Surface Type

Surface Type	Length (km)	Percentage of System
Earth (ETH)	6.68	5.47%
Gravel (G/S)	77.77	63.70%
Low Class Bituminous (LCB) (Surface Treatment) over Cold Mix Asphalt	21.94	17.97%
High Class Bituminous (HCB) (Asphalt)	15.70	12.86%
Total	**122.09**	**100.00%**

Road classifications by the *'Manual'* are based on the traffic volumes and the roadside environment for each road section. Rural roads are classified on traffic volumes while semi-urban and urban roads are classified on their primary function. However, most municipalities base their capital and maintenance operations on O. Reg 239/02, Minimum Maintenance Standards for Municipal Highways (MMS), which uses traffic volumes as well as the speed limit to classify each road section. During the completion of the study, all road sections were classified using both systems.

Posted maximum speeds limits were noted in the field review but not every road section had a posted maximum speed limit. As the Township of South Algonquin does not have any by-laws regarding the speed limits on roads without a posted speed limit, statutory speed limits were interpreted from the *Highway Traffic Act* (HTA) R.S.O. 1990. Relevant excerpts from the HTA have been included in Appendix J.

Table 3 identifies the Minimum Maintenance Standard road classifications.

Table 3 – Minimum Maintenance Standard (MMS) Road Classifications

Average Annual Daily Traffic (number of motor vehicles)	Posted or Statutory Speed Limit (kilometers per hour)						
	91 - 100	81 - 90	71 - 80	61 - 70	51 - 60	41 - 50	1 - 40
53,000 or more	1	1	1	1	1	1	1
23,000 – 52,999	1	1	1	2	2	2	2
15,000 – 22,999	1	1	2	2	2	3	3
12,000 – 14,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
6,000 - 7,999	1	2	2	3	3	4	4
5,000 - 5,999	1	2	2	3	3	4	4
4,000 - 4,999	1	2	3	3	3	4	4
3,000 - 3,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6

Table 4 breaks the network into road classifications under the MMS.

Table 4 – Road Breakdown by Class (O.Reg 239/02)

Road Classification	Length (km)	Percentage of System
1	0.00	0.0%
2	0.00	0.0%
3	0.00	0.0%
4	10.40	8.52%
5	15.19	12.44%
6	96.50	79.04%
Total	**122.09**	**100.00%**

8.0 Road System Time of Need and Adequacy

8.1 Time of Need

The system adequacy reflects the current state of the road network and serves as a benchmark on which to base future evaluations. Road sections with a rehabilitation or reconstruction strategy with a 'NOW' need are a representation of work that is currently required on the road system to address the existing needs of the system.

Table 5 – Summary of Costs by Time of Need

Item	NOW	1-5	6-10	Total
Construction Needs	$3,306,000	$421,000	$0.00	$3,727,000
Resurfacing Needs	$0	$0	$167,000	$167,000
Total	**$3,306,000**	**$421,000**	**$167,000**	**$3,894,000**

As stated previously, the *'Manual'* states that low volume rural roads with an AADT less than 50 shall be considered adequate with normal maintenance procedures. The township road network currently includes 85.61km of rural roads with an AADT less than 50. Estimated improvements costs for these roads is $16,277,000.

8.2 System Adequacy

System adequacy is a comparison between the length of the road network without an identified 'NOW' need and the length of the entire network resulting in a rating out of 100. The road system adequacy is calculated as follows;

$$\textit{System Adequacy} = \frac{\text{Total Length of Road (km)} - \text{(Length of NOW Deficiencies)}}{\text{Total Length of Road (km)}} \times 100$$

A decrease in system adequacy over time would indicate that inappropriate strategies are being implemented and/or adequate funds are not being directed to the road network. Therefore, a review of

historical system adequacy figures is a good indicator of the overall performance of the road network, capital, and maintenance.

Based on the 2022 evaluation, the Township of South Algonquin road network has a System Adequacy of 97.2%. An acceptable level for a lower tier system is 60% while an upper tier system should be 70%.

It should be noted that while low volume roads are considered adequate, these roads make up approximately 50% of the municipal road network. Excluding these roads from the system adequacy calculation has a significant effect and greatly improves the result.

9.0 Road System Rating and Prioritization

9.1 Road System Rating

Road System Ratings are a basic measure of the importance of a road section relative to its condition and the traffic it serves. These are only two factors and many other factors need to be considered when rating the importance of one road section over another. However, the rating provides the Township with some insight into the importance of each road section to road users. The evaluation for each road section includes a Priority Rating with a higher number representing a road considered to be of higher importance.

9.2 Prioritization

A Priority Guide Number is another rating that, along with condition and traffic, also considers the cost of improving the road section when prioritizing the road sections requiring rehabilitation or reconstruction. Including the improvement cost in the prioritization assists the Township in providing the most benefit to drivers per dollar spent. Again, there are other project specific factors that should be considered in prioritizing road projects and this reinforces the need for accurate traffic volumes.

10.0 Findings

The terrain and soil type throughout the Township can be classified as rocky and rolling which has largely driven the design and means and methods of construction of the municipal road network. There were several needs that were consistent throughout the road network including;

- Ditching - intermittent or not present at all on many road sections
- Boulders with the road surface
- Low shoulders on the inside of horizontal curves
- High shoulders against the ditch foreslope (berms)

Ditching

There are three (3) road sections subject to flooding during the year. Overall, the lack of ditching does not seem to be adversely affecting the performance of the road system with one exception. On many of the rural roads, there is little to no ditching on crest curves. This is trapping water on the travelled surface of the gravel roads and causing significant erosion mostly in the shoulder but erosion was also noted on the traveled surface of several road sections. Increased maintenance is required to address the on-going erosion through the placement of additional gravel both on the surface and the shoulders.

Although the width of the existing road allowances are unknown, discussions with Township staff identified several road sections as forced/ trespass roads or shoreline roads. The Township has limited ability to make improvements to the road cross section of forced roads and it is most likely that property would need to be acquired to facilitate any improvements.

Based on discussions with township staff, significant improvements are not planned for any of the shoreline roads therefore property is less of a concern in these road sections.

Boulders

Many road sections, loose and hard topped, had boulders within the traveled surface. It is unknown whether the boulders were not removed during construction or if they have simply worked their way to the surface. It is likely that their presence is a combination of both.

Low Shoulders on the Inside of Horizontal Curves

A driver's tendency is to track to the inside of a horizontal curve. Although there is not a significant length of rural hard topped roads, this has lead to lower shoulders in the horizontal curves leading to more severe edge break and moderate severity potholing in the shoulder of these areas.

High Shoulders Against the Ditch Foreslope (Berms)

The majority of roads within the Township follow the contours of the existing ground and are built up from their surroundings which provides some grade to assist with surface drainage. Although there are many roads with narrow shoulders, buildup of winter sand and the growth of vegetation in the shoulders prevents surface water from draining away from the road. This situation further compounds the low shoulder condition against the travelled edge as water from the shoulder is actually directed back towards the driving surface.

During a field review with Township staff, it was noted that spring grading operations would include removal of the berms at the edge of the road platform. This will greatly improve surface drainage and reduce erosion in the shoulder and/or driving surface.

11.0 Recommendations

Based on the road inventory and condition assessment, Jewell Engineering Inc. puts forth the following recommendations for consideration by the Township.

11.0.1 Assumptions

For budgetary considerations, standard widths (as per the Manual) have been applied to all road sections. Actual dimensions and quantities should be refined prior to finalizing budget requirements. Cost estimates are in 2022 dollars.

11.0.2 Other Cost Considerations

Suggested budget allocations are exclusive of the contractors administrative costs such as mobilization/demobilization, bonding and insurance, etc.

The recommendations of the study, in terms of the anticipated funding required for the road system, are based on generic reconstruction practices outlined in the Manual. These include general items typical of road reconstruction or resurfacing projects and do not necessarily consider the full width of the right-of-way. This is to say, non-typical items not directly related to the reconstruction of the road, such as sidewalks and utility relocations, are not accounted for in the cost estimates. Thus the need for more detailed engineering strategies prior to rehabilitation or reconstruction of road assets.

11.0.4 Traffic Counting Program

It is recommended that the Township implement an annual traffic counting program to ensure accurate volumes are attributed to each road section and that each road is classified properly. Not all sections need to be updated each year. Counts should be completed in a manner that allows all road sections to be updated between study updates.

11.1 Resurfacing

Gravel Resurfacing

There are currently 16.16km of gravel road that have been identified as a 'NOW' reconstruct. Of the remaining 61.23km, 16.86km are low volume roads which have been identified as having a 'NOW' reconstruct need. To properly maintain the remaining 44.37km of gravel road within a typical 3-year cycle, the Township should resurface 14.8km per year. At $25,000/km, the Township should budget approximately $370,000 per year for gravel resurfacing.

It is assumed that the Township would not resurface low volume gravel roads that have a 'NOW' reconstruct need.

Low Class Bituminous (Surface Treatment)

There are currently no surface treated roads that have been identified as a 'NOW' reconstruct need. To resurface the 25.04km of low-class bituminous road within a typical 7-year cycle, the Township should resurface 3.57km per year. At $57,000/km for a single surface treatment, the Township should budget approximately $205,000 per year for resurfacing low class bituminous roads.

High Class Bituminous (Hot Mix Asphalt)

There are currently no sections of asphalt road that have been identified as a 'NOW' reconstruct. To resurface the 16.43km of high-class bituminous road within a typical 15-year cycle, the Township should resurface 1.1km per year. At $155,000/km to resurface with one lift of asphalt, the Township should budget approximately $170,500 per year for resurfacing asphalt roads.

Total recommended annual preservation budget is $760,500.00 for preservation programs. This excludes any capital reconstruction projects.

11.2 Reconstruction

Since the last study was completed, the Township has completed a mix of resurfacing and reconstruction projects. It is recommended that the Township continue this practice and include a budget allocation for preservation, resurfacing and reconstruction.

The Manual uses the 'Priority Guide Number' to prioritize road sections with an improvement cost based on cost per user. Prioritizing roads based on best value for dollar spent rather than on the condition of the road will assist the Township in preparing a reasonable and effective capital plan for reconstruction projects.

Other recommendations to consider:

1. Implement an annual traffic counting program. 20% of the roads can be counted annually, ensuring the Township has accurate and up-to-date information. Accurate traffic volumes ensure roads are classified, constructed, and maintained properly. This will also assist in prioritizing needs and preparing capital and maintenance programs.
2. If the Township would like to more accurately reflect future construction costs based on actual road properties, consideration should be given to development of municipal standards for the road network. Cost estimates prepared in this report are based on rehabilitation and reconstruction items included in the Manual and do not necessarily reflect current road conditions.

From a budgetary perspective, the Township should look to prioritize preservation type projects, such as crack sealing, and rehabilitation projects, such as resurfacing, over reconstruction projects as this will maintain and renew the road network and assist in ensuring the maximum service life of the system is reached.

12.0 Statement of Limitations

This report has been prepared by Jewell Engineering Inc. on behalf of the Township of South Algonquin. Conclusions and recommendations in this report are based on observations in the field and available background information.

The report documents the road conditions observed on the specific days the roads were reviewed and should only be used as a guideline in preparing short- and long-term capital and maintenance programs. Costs are preliminary and based on the Inventory Manual and do not necessarily consider all aspects of rehabilitation or reconstruction.

The report has been prepared for the express use of the Township of South Algonquin and any use by a third party is prohibited.

APPENDIX A

SECTION LISTING

Township South Algonquin (By Section Number)

Section No.	Name	From	To
RD010	Airy Road	Highway 60	0.9km west of Highway 60
RD020	Airy Road	0.9 km west of Highway 60	1.2 km west of Highway 60
RD030	Galeairy Lake Road	Maple Drive (N)	Maple Drive (S)
RD035	Galeairy Lake Road	Highway 60	Maple Drive (N)
RD040	Maple Drive	Galeairy Lake Rd. N.	Galeairy Lake Rd. S.
RD050	Sunset Trail	Maple Drive	End
RD060	Birch Crescent	Maple Drive	End
RD070	Hemlock Crescent	Maple Drive	End
RD080	Galeairy Lake Crescent	Galeairy Lake Road	End
RD090	Fire Route-Dam	Galeairy Lake Road	End
RD100	Hay Creek Road (PA)	Highway 60	1.25 km South of Highway 60
RD110	Hay Creek Road (UP)	1.25 km South of Ottawa Street	McCrae's Mill
RD120	Dave Bowers Road	Hay Creek Road	0.1 km west of Hay Creek Road
RD130	Ottawa Street	First Avenue	Second Avenue
RD135	Ottawa Street	Highway 60	First Avenue
RD140	Lake Street	Third Avenue	Lakeshore Drive
RD145	Lake Street	Second Avenue	Third Avenue
RD150	Boat Launch Road	Ottawa Street	0.10 west of Ottawa Street
RD160	Lakeshore Avenue	Hay Creek Road	Third Street
RD170	First Avenue	Hay Creek Road	Ottawa Street
RD180	Second Avenue	Hay Creek Road	Ottawa Street
RD190	Third Avenue	Hay Creek Road	Lakeshore Drive
RD200	Mill Street	First Avenue	Second Avenue
RD220	Paradise Road	Highway 60	1.1 km south of Highway 60
RD230	Paradise Road	1.1 km south of Highway 60	End
RD240	Hilltop Crescent	Highway 60	End
RD250	Church Hill Street	Post Street	0.06 km South of Post Street
RD254	Church Hill Street	0.06 South of Post Street	300m North of Highway 60
RD258	Church Hill Street	300m North of Highway 60	Highway 60

Section No.	Name	From	To
RD260	Park Street	Highway 60	Paradise Rd.
RD280	Post Street	Highway 60	Medical Centre Road
RD290	Post Street	Medical Centre Road	End
RD300	Medical Centre Road	Post Street	End
RD310	Madawaska Avenue	Post Street	Madawaska Street
RD320	Madawaska Street	Algonquin Street	End
RD330	Madawaska Street	Highway 60	Madawaska Avenue
RD335	Madawaska Street	Madawaska Avenue	Algonquin Street
RD340	Algonquin Street	Madawaska Street	Algonquin Cresent
RD340	Algonquin Street	Algonquin Cresent	End
RD350	Algonquin Crescent	Highway 60	End
RD360	Nipissing Road	Algonquin Street	0.6 km East of Algonquin Street
RD380	Nipissing Road	0.6 km East of Algonquin Street	2.3 km East of Algonquin Street
RD390	Old Highway 127	Highway 60	Highway 127
RD400	Spectacle Lake Road	Highway 60	Dickens Township Boundary
RD410	Aylen Lake Road	Highway 60	End
RD420	Gaffney Road	Aylen Lake Road	Moonlight Road
RD424	Gaffney Road	Moonlight Bay Road	Burnt Depot Road
RD428	Gaffney Road	Burnt Depot Road	End
RD430	Burnt Depot Road	Gaffney Road	200m East of Gaffney Road
RD435	Burnt Depot Road	200m East of Gaffney Road	End
RD440	Moonlight Bay Road	Gaffney Road	End
RD450	Whites Road	Aylen Lake Road	End
RD460	North Aylen Lake Road	Aylen Lake	Chapel Lane
RD463	North Aylen Lake Road	Chapel Lane	Ferndale Lane
RD466	North Aylen Lake Road	Ferndale Lane	End
RD470	Pringles Road	North Aylen Lake Road	End
RD480	Shields Road	North Aylen Lake Road	End
RD490	Old Farm Road	Aylen Lake North Road	End
RD500	Paplinskie Road	Highway 60	Civic #221
RD505	Paplinskie Road	Civic #221	End

Section No.	Name	From	To
RD510	Dunnes Road	Highway 60	End
RD520	Dawson Street	Highway 60 West	Highway 60 East
RD530	Merton Street	Murchison Road	Highway 60
RD540	Murchison Road	Dawson Street	End
RD550	Holstein Street	Merton Road	End
RD580	Victoria Street	Highway 60	Major Lake Road
RD590	Fire Route - Pump House	Major Lake Road	End
RD600	Tom and Mick Murray Park Road	Highway 523	End
RD610	Major Lake Road	Highway 60	Victoria Street
RD612	Major Lake Road	Victoria Street	4.7km North of Highway 60
RD613	Major Lake Road	4.7km North of Highway 60	6km North of Highway 60
RD614	Major Lake Road	6km North of Highway 60	Victoria Lake Road
RD615	Major Lake Road	Victoria Lake Road	McCaulley Lake Road
RD630	Victoria Lake Road	Major Lake Road	Civic #700
RD635	Victoria Lake Road	Civic #700	End
RD640	McCauley Lake Road	Major Lake Road	End
RD660	Reids Road	Highway 523	End
RD670	Lyell Lake Landing Road	Highway 523	End
RD680	McGuey Road	Highway 127	Civic# 471
RD685	McGuey Road	Civic #471	End
RD690	McRae-Hay Lake Road (PA)	2.4km West of Highway 127 (Civic 510)	McRae-Hay Lake Road (UP)
RD691	McRae-Hay Lake Road (PA)	Highway 127	2.4km West of Highway 127 (Civic 510)
RD700	McRae-Hay Lake Road (UP)	North Road	End
RD710	Bennett Road	McRae-Hay Lake Road	End
RD730	McKenzie Lake Road	Highway 127	Proven Line
RD732	McKenzie Lake Road	Proven Line	North McKenzie Lake Road
RD734	McKenzie Lake Road	North McKenzie Lake Road	South McKenzie Lake Road

Section No.	Name	From	To
RD736	McKenzie Lake Road	South McKenzie Lake Road	Highway 127
RD740	South McKenzie Lake Road	McKenzie Lake Road	End
RD750	North McKenzie Lake Road	McKenzie Lake Rd.	Civic #681 (Moosemeat Archery)
RD752	North McKenzie Lake Road	Civic #681 (Moosemeat Archery)	Henry Coglan Drive
RD755	North McKenzie Lake Road	Henry Coglan Drive	End
RD760	Henry Coglan Drive	North McKenzie Lake Road	End
RD770	Proven Line	McKenzie Lake Road	Pastwa Lake Road
RD780	Pastwa Lake Road	Proven Line	2.7 km East of Proven Line
RD785	Pastwa Lake Road	2.7 km East of Proven Line	End
RD790	Kuiack Road	Pastwa Lake Road	End
RD791	Kenny Road	Paradise	End

APPENDIX B

ROAD SECTIONS BY CRITICAL DEFICIENCIES

Township South Algonquin (2022) Road Conditions

Name	From	To	Surface Condition	Surface Type	Surface Width	Structural Adequacy	Drainage
Airy Road	Highway 60	0.9km west of Highway 60	8	ADEQ	ADEQ	ADEQ	ADEQ
Airy Road	0.9 km west of Highway 60	1.2 km west of Highway 60	9	ADEQ	NOW	ADEQ	(1-5)
Galeairy Lake Road	Maple Drive (N)	Maple Drive (S)	9	ADEQ	ADEQ	ADEQ	ADEQ
Galeairy Lake Road	Highway 60	Maple Drive (N)	9	ADEQ	ADEQ	ADEQ	ADEQ
Maple Drive	Galeairy Lake Rd. N.	Galeairy Lake Rd. S.	9	ADEQ	ADEQ	ADEQ	ADEQ
Sunset Trail	Maple Drive	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Birch Crescent	Maple Drive	End	9	ADEQ	ADEQ	ADEQ	ADEQ
Hemlock Crescent	Maple Drive	End	9	ADEQ	ADEQ	ADEQ	ADEQ
Galeairy Lake Crescent	Galeairy Lake Road	End	9	NOW	NOW	ADEQ	(6-10)
Fire Route-Dam	Galeairy Lake Road	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Hay Creek Road (PA)	Highway 60	1.25 km South of Highway 60	4	ADEQ	ADEQ	NOW	ADEQ
Hay Creek Road (UP)	1.25 km South of Ottawa Street	McCrae's Mill	7	NOW	ADEQ	ADEQ	(6-10)
Dave Bowers Road	Hay Creek Road	0.1 km west of Hay Creek Road	7	ADEQ	NOW	ADEQ	ADEQ
Ottawa Street	First Avenue	Second Avenue	9	ADEQ	ADEQ	ADEQ	ADEQ
Ottawa Street	Highway 60	First Avenue	8	ADEQ	ADEQ	ADEQ	ADEQ
Lake Street	Third Avenue	Lakeshore Drive	8	ADEQ	ADEQ	ADEQ	ADEQ
Lake Street	Second Avenue	Third Avenue	8	ADEQ	ADEQ	ADEQ	ADEQ
Boat Launch Road	Ottawa Street	0.10 west of Ottawa Street	9	ADEQ	ADEQ	ADEQ	ADEQ

Name	From	To	Surface Condition	Surface Type	Surface Width	Structural Adequacy	Drainage
Lakeshore Avenue	Hay Creek Road	Third Street	7	ADEQ	NOW	ADEQ	ADEQ
First Avenue	Hay Creek Road	Ottawa Street	10	ADEQ	ADEQ	ADEQ	ADEQ
Second Avenue	Hay Creek Road	Ottawa Street	5	ADEQ	ADEQ	(1-5)	ADEQ
Third Avenue	Hay Creek Road	Lakeshore Drive	6	ADEQ	ADEQ	(6-10)	ADEQ
Mill Street	First Avenue	Second Avenue	10	ADEQ	ADEQ	ADEQ	ADEQ
Paradise Road	Highway 60	1.1 km south of Highway 60	10	ADEQ	ADEQ	ADEQ	ADEQ
Paradise Road	1.1 km south of Highway 60	End	6	ADEQ	ADEQ	ADEQ	(6-10)
Hilltop Crescent	Highway 60	End	6	NOW	ADEQ	ADEQ	ADEQ
Church Hill Street	Post Street	0.06 km South of Post Street	9	ADEQ	ADEQ	ADEQ	ADEQ
Church Hill Street	0.06 South of Post Street	300m North of Highway 60	5	ADEQ	ADEQ	(1-5)	NOW
Church Hill Street	300m North of Highway 60	Highway 60	7	NOW	ADEQ	ADEQ	ADEQ
Park Street	Highway 60	Paradise Rd.	10	ADEQ	ADEQ	ADEQ	ADEQ
Post Street	Highway 60	Medical Centre Road	9	ADEQ	ADEQ	ADEQ	ADEQ
Post Street	Medical Centre Road	End	6	ADEQ	ADEQ	(1-5)	(1-5)
Medical Centre Road	Post Street	End	6	ADEQ	ADEQ	(1-5)	ADEQ
Madawaska Avenue	Post Street	Madawaska Street	10	ADEQ	ADEQ	ADEQ	NOW
Madawaska Street	Algonquin Street	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Madawaska Street	Highway 60	Madawaska Avenue	5	ADEQ	ADEQ	(1-5)	ADEQ
Madawaska Street	Madawaska Avenue	Algonquin Street	10	ADEQ	ADEQ	ADEQ	ADEQ
Algonquin Street	Algonquin Cresent	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Algonquin Street	Madawaska Street	Algonquin Cresent	9	ADEQ	ADEQ	ADEQ	ADEQ
Algonquin Crescent	Highway 60	End	8	ADEQ	ADEQ	ADEQ	ADEQ

Name	From	To	Surface Condition	Surface Type	Surface Width	Structural Adequacy	Drainage
Nipissing Road	Algonquin Street	0.6 km East of Algonquin Street	7	ADEQ	ADEQ	(1-5)	ADEQ
Nipissing Road	0.6 km East of Algonquin Street	2.3 km East of Algonquin Street	7	ADEQ	ADEQ	ADEQ	ADEQ
Old Highway 127	Highway 60	Highway 127	6	ADEQ	ADEQ	ADEQ	(6-10)
Spectacle Lake Road	Highway 60	Dickens Township Boundary	9	ADEQ	ADEQ	ADEQ	ADEQ
Aylen Lake Road	Highway 60	End	10	ADEQ	ADEQ	ADEQ	ADEQ
Gaffney Road	Aylen Lake Road	Moonlight Road	6	ADEQ	ADEQ	ADEQ	ADEQ
Gaffney Road	Moonlight Bay Road	Burnt Depot Road	8	ADEQ	ADEQ	ADEQ	ADEQ
Gaffney Road	Burnt Depot Road	End	7	ADEQ	NOW	ADEQ	ADEQ
Burnt Depot Road	200m East of Gaffney Road	End	4	ADEQ	NOW	NOW	(6-10)
Burnt Depot Road	Gaffney Road	200m East of Gaffney Road	7	ADEQ	ADEQ	ADEQ	ADEQ
Moonlight Bay Road	Gaffney Road	End	8	ADEQ	ADEQ	ADEQ	ADEQ
Whites Road	Aylen Lake Road	End	6	ADEQ	ADEQ	ADEQ	ADEQ
North Aylen Lake Road	Aylen Lake	Chapel Lane	6	ADEQ	NOW	ADEQ	ADEQ
North Aylen Lake Road	Chapel Lane	Ferndale Lane	7	ADEQ	NOW	ADEQ	ADEQ
North Aylen Lake Road	Ferndale Lane	End	7	ADEQ	NOW	ADEQ	ADEQ
Pringles Road	North Aylen Lake Road	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Shields Road	North Aylen Lake Road	End	10	ADEQ	ADEQ	ADEQ	ADEQ
Old Farm Road	Aylen Lake North Road	End	4	ADEQ	NOW	NOW	(6-10)
Paplinskie Road	Highway 60	Civic #221	7	ADEQ	NOW	ADEQ	(6-10)
Paplinskie Road	Civic #221	End	7	ADEQ	ADEQ	ADEQ	(6-10)
Dunnes Road	Highway 60	End	5	ADEQ	NOW	ADEQ	(6-10)
Dawson Street	Highway 60 West	Highway 60 East	7	ADEQ	ADEQ	ADEQ	ADEQ

Name	From	To	Surface Condition	Surface Type	Surface Width	Structural Adequacy	Drainage
Merton Street	Murchison Road	Highway 60	7	ADEQ	ADEQ	ADEQ	ADEQ
Murchison Road	Dawson Street	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Holstein Street	Merton Road	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Victoria Street	Highway 60	Major Lake Road	8	ADEQ	ADEQ	ADEQ	ADEQ
Fire Route - Pump House	Major Lake Road	End	9	ADEQ	ADEQ	ADEQ	ADEQ
Tom and Mick Murray Park Road	Highway 523	End	8	ADEQ	NOW	ADEQ	ADEQ
Major Lake Road	Highway 60	Victoria Street	5	ADEQ	ADEQ	(6-10)	ADEQ
Major Lake Road	Victoria Street	4.7km North of Highway 60	7	ADEQ	ADEQ	(6-10)	ADEQ
Major Lake Road	4.7km North of Highway 60	6km North of Highway 60	9	ADEQ	ADEQ	ADEQ	ADEQ
Major Lake Road	6km North of Highway 60	Victoria Lake Road	6	ADEQ	ADEQ	(6-10)	ADEQ
Major Lake Road	Victoria Lake Road	McCaulley Lake Road	9	ADEQ	ADEQ	(6-10)	ADEQ
Victoria Lake Road	Major Lake Road	Civic #700	8	ADEQ	ADEQ	ADEQ	ADEQ
Victoria Lake Road	Civic #700	End	7	ADEQ	ADEQ	ADEQ	ADEQ
McCauley Lake Road	Major Lake Road	End	7	ADEQ	ADEQ	ADEQ	ADEQ
Reids Road	Highway 523	End	8	ADEQ	ADEQ	ADEQ	ADEQ
Lyell Lake Landing Road	Highway 523	End	8	ADEQ	ADEQ	ADEQ	ADEQ
McGuey Road	Highway 127	Civic# 471	8	ADEQ	ADEQ	ADEQ	ADEQ
McGuey Road	Civic #471	End	8	ADEQ	ADEQ	ADEQ	ADEQ
McRae-Hay Lake Road (PA)	2.4km West of Highway 127 (Civic 510)	McRae-Hay Lake Road (UP)	4	ADEQ	ADEQ	NOW	ADEQ
McRae-Hay Lake Road (PA)	Highway 127	2.4km West of Highway 127 (Civic 510)	6	ADEQ	ADEQ	(1-5)	ADEQ
McRae-Hay Lake Road (UP)	North Road	End	7	ADEQ	NOW	ADEQ	ADEQ
Bennett Road	McRae-Hay Lake Road	End	4	ADEQ	NOW	NOW	(6-10)

Name	From	To	Surface Condition	Surface Type	Surface Width	Structural Adequacy	Drainage
McKenzie Lake Road	South McKenzie Lake Road	Highway 127	8	ADEQ	ADEQ	ADEQ	ADEQ
McKenzie Lake Road	Highway 127	Proven Line	9	ADEQ	ADEQ	ADEQ	ADEQ
McKenzie Lake Road	Proven Line	North McKenzie Lake Road	8	ADEQ	ADEQ	ADEQ	ADEQ
McKenzie Lake Road	North McKenzie Lake Road	South McKenzie Lake Road	7	ADEQ	ADEQ	ADEQ	ADEQ
South McKenzie Lake Road	McKenzie Lake Road	End	7	ADEQ	ADEQ	ADEQ	ADEQ
North McKenzie Lake Road	McKenzie Lake Rd.	Civic #681 (Moosemeat Archery)	6	ADEQ	ADEQ	ADEQ	ADEQ
North McKenzie Lake Road	Civic #681 (Moosemeat Archery)	Henry Coglan Drive	7	ADEQ	ADEQ	ADEQ	ADEQ
North McKenzie Lake Road	Henry Coglan Drive	End	8	ADEQ	ADEQ	ADEQ	ADEQ
Henry Coglan Drive	North McKenzie Lake Road	End	8	ADEQ	ADEQ	ADEQ	ADEQ
Proven Line	McKenzie Lake Road	Pastwa Lake Road	7	ADEQ	ADEQ	ADEQ	ADEQ
Pastwa Lake Road	Proven Line	2.7 km East of Proven Line	7	ADEQ	ADEQ	NOW	NOW
Pastwa Lake Road	2.7 km East of Proven Line	End	1	ADEQ	NOW	NOW	NOW
Kuiack Road	Pastwa Lake Road	End	8	ADEQ	NOW	ADEQ	ADEQ
Kenny Road	Paradise	End	9	ADEQ	ADEQ	ADEQ	ADEQ

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APPENDIX C

‘NOW’ RECONSTRUCTION NEEDS

NOW Reconstruction Needs All Roads

Sec. #	Name	From	To	Length	Priority Guide	Surf	Type of Improvement	Time of Improvement	Total Cost
RD100	Hay Creek Road (PA)	Highway 60	1.25 km South of Highway 60	1.250	**151.2**	LCB	REC	NOW	$1,359,895.83
RD110	Hay Creek Road (UP)	1.25 km South of Ottawa Street	McCrae's Mill	0.750	**87.6**	G/S	REC	NOW	$928,467.11
RD254	Church Hill Street	0.06 South of Post Street	300m North of Highway 60	0.380	**33.2**	LCB	REC	NOW	$363,785.60
RD240	Hilltop Crescent	Highway 60	End	0.360	**16.9**	ETH	REC	NOW	$242,287.63
RD258	Church Hill Street	300m North of Highway 60	Highway 60	0.300	**12.8**	G/S	REC	NOW	$287,199.16
RD080	Galeairy Lake Crescent	Galeairy Lake Road	End	0.130	**6.0**	G/S	REC	NOW	$124,452.97
				3.170					**$3,306,088.30**

APPENDIX D

‘(1-5)’ RECONSTRUCTION NEEDS

1-5 Year Reconstruction Needs All Roads

Sec. #	Name	From	To	Length	Priority Guide	Surf	Type of Improvement	Time of Improvement	Total Cost
RD300	Medical Centre Road	Post Street	End	0.170	**39.0**	LCB	REC	(1-5)	$162,746.19
RD290	Post Street	Medical Centre Road	End	0.170	**29.9**	LCB	REC	(1-5)	$162,746.19
RD330	Madawaska Street	Highway 60	Madawaska Avenue	0.100	**8.6**	LCB	REC	(1-5)	$95,733.05
				0.440					**$421,225.43**

APPENDIX E

‘(6-10)’ RESURFACING NEEDS

6-10 Year Resurfacing Needs All Roads

Sec. #	Name	From	To	Length	Priority Guide	Surf	Type of Improvement	Time of Improvement	Total Cost
RD610	Major Lake Road	Highway 60	Victoria Street	0.700	**245.7**	LCB	R1	(6-10)	$40,360.32
RD614	Major Lake Road	6km North of Highway 60	Victoria Lake Road	2.000	**232.4**	LCB	R1	(6-10)	$115,315.20
RD190	Third Avenue	Hay Creek Road	Lakeshore Drive	0.120	**89.3**	LCB	R1	(6-10)	$11,254.54
				2.820					**$166,930.06**

APPENDIX F

MINIMUM MAINTENANCE STANDARDS (MMS)

ROAD CLASSIFICATIONS

MMS Classification

Sec. #	Name	From	To	Length	MMS Class	AADT	AADT Year	Speed Limit
RD010	Airy Road	Highway 60	0.9km west of Highway 60	0.900	**6**	**10**	**2021**	**50**
RD020	Airy Road	0.9 km west of Highway 60	1.2 km west of Highway 60	0.300	**6**	**10**	**2021**	**50**
RD030	Galeairy Lake Road	Maple Drive (N)	Maple Drive (S)	0.440	**6**	**318**	**2021**	**40**
RD035	Galeairy Lake Road	Highway 60	Maple Drive (N)	0.250	**6**	**318**	**2021**	**40**
RD040	Maple Drive	Galeairy Lake Rd. N.	Galeairy Lake Rd. S.	0.850	**5**	**300**		**50**
RD050	Sunset Trail	Maple Drive	End	0.600	**6**	**40**		**50**
RD060	Birch Crescent	Maple Drive	End	0.150	**6**	**20**		**50**
RD070	Hemlock Crescent	Maple Drive	End	0.130	**6**	**20**		**50**
RD080	Galeairy Lake Crescent	Galeairy Lake Road	End	0.130	**6**	**20**		**40**
RD090	Fire Route-Dam	Galeairy Lake Road	End	0.050	**6**	**5**		**50**
RD100	Hay Creek Road (PA)	Highway 60	1.25 km South of Highway 60	1.250	**5**	**638**	**2021**	**40**
RD110	Hay Creek Road (UP)	1.25 km South of Ottawa Street	McCrae's Mill	0.750	**5**	**638**	**2021**	**40**
RD120	Dave Bowers Road	Hay Creek Road	0.1 km west of Hay Creek Road	0.100	**6**	**20**		**50**
RD130	Ottawa Street	First Avenue	Second Avenue	0.200	**5**	**624**	**2021**	**50**
RD135	Ottawa Street	Highway 60	First Avenue	0.400	**5**	**624**	**2021**	**50**
RD140	Lake Street	Third Avenue	Lakeshore Drive	0.250	**6**	**156**		**50**
RD145	Lake Street	Second Avenue	Third Avenue	0.300	**6**	**156**		**50**
RD150	Boat Launch Road	Ottawa Street	0.10 west of Ottawa Street	0.100	**6**	**10**		**50**
RD160	Lakeshore Avenue	Hay Creek Road	Third Street	0.600	**6**	**30**		**50**

Sec. #	Name	From	To	Length	MMS Class	AADT	AADT Year	Speed Limit
RD170	First Avenue	Hay Creek Road	Ottawa Street	0.200	**6**	**156**		**50**
RD180	Second Avenue	Hay Creek Road	Ottawa Street	0.210	**6**	**156**		**50**
RD190	Third Avenue	Hay Creek Road	Lakeshore Drive	0.120	**6**	**156**		**50**
RD200	Mill Street	First Avenue	Second Avenue	0.200	**6**	**156**		**50**
RD220	Paradise Road	Highway 60	1.1 km south of Highway 60	1.100	**6**	**195**	**2021**	**50**
RD230	Paradise Road	1.1 km south of Highway 60	End	1.300	**6**	**5**	**2021**	**50**
RD240	Hilltop Crescent	Highway 60	End	0.360	**6**	**50**		**50**
RD250	Church Hill Street	Post Street	0.06 km South of Post Street	0.060	**6**	**93**		**50**
RD254	Church Hill Street	0.06 South of Post Street	300m North of Highway 60	0.380	**6**	**93**		**50**
RD258	Church Hill Street	300m North of Highway 60	Highway 60	0.300	**6**	**93**		**50**
RD260	Park Street	Highway 60	Paradise Rd.	0.245	**6**	**93**		**50**
RD280	Post Street	Highway 60	Medical Centre Road	0.270	**5**	**371**	**2021**	**50**
RD290	Post Street	Medical Centre Road	End	0.170	**6**	**93**		**50**
RD300	Medical Centre Road	Post Street	End	0.170	**6**	**186**		**50**
RD310	Madawaska Avenue	Post Street	Madawaska Street	0.050	**6**	**0**		**50**
RD320	Madawaska Street	Algonquin Street	End	1.000	**6**	**40**		**50**
RD330	Madawaska Street	Highway 60	Madawaska Avenue	0.100	**6**	**25**	**2021**	**50**
RD335	Madawaska Street	Madawaska Avenue	Algonquin Street	0.200	**5**	**300**		**50**
RD340	Algonquin Street	Madawaska Street	Algonquin Cresent	0.700	**6**	**39**	**2021**	**50**
RD340	Algonquin Street	Algonquin Cresent	End	0.210	**6**	**39**	**2021**	**50**
RD350	Algonquin Crescent	Highway 60	End	0.400	**6**	**20**		**50**

Sec. #	Name	From	To	Length	MMS Class	AADT	AADT Year	Speed Limit
RD360	Nipissing Road	Algonquin Street	0.6 km East of Algonquin Street	0.600	**5**	**300**		**50**
RD380	Nipissing Road	0.6 km East of Algonquin Street	2.3 km East of Algonquin Street	1.670	**5**	**300**		**50**
RD390	Old Highway 127	Highway 60	Highway 127	5.530	**6**	**38**	**2021**	**80**
RD400	Spectacle Lake Road	Highway 60	Dickens Township Boundary	1.380	**6**	**62**	**2021**	**50**
RD410	Aylen Lake Road	Highway 60	End	8.300	**5**	**86**	**2021**	**60**
RD420	Gaffney Road	Aylen Lake Road	Moonlight Road	0.810	**6**	**21**		**80**
RD424	Gaffney Road	Moonlight Bay Road	Burnt Depot Road	3.870	**6**	**21**		**80**
RD428	Gaffney Road	Burnt Depot Road	End	0.620	**6**	**21**		**80**
RD435	Burnt Depot Road	200m East of Gaffney Road	End	0.300	**6**	**5**		**80**
RD430	Burnt Depot Road	Gaffney Road	200m East of Gaffney Road	0.200	**6**	**5**		**80**
RD440	Moonlight Bay Road	Gaffney Road	End	2.200	**6**	**5**		**80**
RD450	Whites Road	Aylen Lake Road	End	0.700	**6**	**5**		**80**
RD460	North Aylen Lake Road	Aylen Lake	Chapel Lane	3.320	**6**	**43**		**80**
RD463	North Aylen Lake Road	Chapel Lane	Ferndale Lane	2.080	**6**	**43**		**80**
RD466	North Aylen Lake Road	Ferndale Lane	End	2.310	**6**	**43**		**80**
RD470	Pringles Road	North Aylen Lake Road	End	0.670	**6**	**10**		**80**
RD480	Shields Road	North Aylen Lake Road	End	0.160	**6**	**10**		**80**
RD490	Old Farm Road	Aylen Lake North Road	End	0.310	**6**	**5**		**80**
RD505	Paplinskie Road	Civic #221	End	1.100	**6**	**39**	**2021**	**80**
RD500	Paplinskie Road	Highway 60	Civic #221	1.000	**6**	**39**		**80**
RD510	Dunnes Road	Highway 60	End	2.100	**6**	**10**		**80**

Sec. #	Name	From	To	Length	MMS Class	AADT	AADT Year	Speed Limit
RD520	Dawson Street	Highway 60 West	Highway 60 East	0.800	**6**	**101**		**50**
RD530	Merton Street	Murchison Road	Highway 60	0.610	**6**	**101**		**50**
RD540	Murchison Road	Dawson Street	End	0.240	**6**	**101**		**50**
RD550	Holstein Street	Merton Road	End	0.500	**6**	**50**		**50**
RD580	Victoria Street	Highway 60	Major Lake Road	0.400	**6**	**79**	**2021**	**50**
RD590	Fire Route - Pump House	Major Lake Road	End	0.150	**6**	**20**		**50**
RD600	Tom and Mick Murray Park Road	Highway 523	End	0.670	**6**	**5**		**80**
RD610	Major Lake Road	Highway 60	Victoria Street	0.700	**5**	**209**	**2021**	**50**
RD612	Major Lake Road	Victoria Street	4.7km North of Highway 60	4.000	**4**	**209**	**2021**	**80**
RD613	Major Lake Road	4.7km North of Highway 60	6km North of Highway 60	1.300	**4**	**209**	**2021**	**80**
RD614	Major Lake Road	6km North of Highway 60	Victoria Lake Road	2.000	**4**	**209**	**2021**	**80**
RD615	Major Lake Road	Victoria Lake Road	McCaulley Lake Road	3.100	**4**	**209**	**2021**	**80**
RD630	Victoria Lake Road	Major Lake Road	Civic #700	3.440	**6**	**5**		**80**
RD635	Victoria Lake Road	Civic #700	End	2.510	**6**	**5**		**80**
RD640	McCauley Lake Road	Major Lake Road	End	3.150	**6**	**11**	**2021**	**80**
RD660	Reids Road	Highway 523	End	0.100	**6**	**20**		**80**
RD670	Lyell Lake Landing Road	Highway 523	End	0.400	**6**	**30**		**80**
RD680	McGuey Road	Highway 127	Civic# 471	2.370	**6**	**44**	**2021**	**80**
RD685	McGuey Road	Civic #471	End	1.970	**6**	**44**	**2021**	**80**
RD690	McRae-Hay Lake Road (PA)	2.4km West of Highway 127 (Civic 510)	McRae-Hay Lake Road (UP)	2.000	**6**	**19**	**2021**	**80**

Sec. #	Name	From	To	Length	MMS Class	AADT	AADT Year	Speed Limit
RD691	McRae-Hay Lake Road (PA)	Highway 127	2.4km West of Highway 127 (Civic 510)	2.400	**6**	**19**	**2021**	**80**
RD700	McRae-Hay Lake Road (UP)	North Road	End	2.480	**6**	**19**		**80**
RD710	Bennett Road	McRae-Hay Lake Road	End	2.360	**6**	**5**		**80**
RD736	McKenzie Lake Road	South McKenzie Lake Road	Highway 127	1.560	**6**	**45**	**2021**	**80**
RD730	McKenzie Lake Road	Highway 127	Proven Line	1.580	**6**	**45**	**2021**	**80**
RD732	McKenzie Lake Road	Proven Line	North McKenzie Lake Road	2.460	**6**	**45**	**2021**	**80**
RD734	McKenzie Lake Road	North McKenzie Lake Road	South McKenzie Lake Road	3.190	**6**	**45**	**2021**	**80**
RD740	South McKenzie Lake Road	McKenzie Lake Road	End	2.600	**6**	**5**		**80**
RD750	North McKenzie Lake Road	McKenzie Lake Rd.	Civic #681 (Moosemeat Archery)	3.410	**6**	**36**		**80**
RD752	North McKenzie Lake Road	Civic #681 (Moosemeat Archery)	Henry Coglan Drive	2.800	**6**	**36**		**80**
RD755	North McKenzie Lake Road	Henry Coglan Drive	End	2.310	**6**	**36**		**80**
RD760	Henry Coglan Drive	North McKenzie Lake Road	End	1.900	**6**	**5**		**80**
RD770	Proven Line	McKenzie Lake Road	Pastwa Lake Road	1.720	**6**	**10**		**80**
RD780	Pastwa Lake Road	Proven Line	2.7 km East of Proven Line	2.400	**6**	**10**		**80**
RD785	Pastwa Lake Road	2.7 km East of Proven Line	End	3.080	**6**	**5**		**80**
RD790	Kuiack Road	Pastwa Lake Road	End	0.500	**6**	**1**		**80**
RD791	Kenny Road	Paradise	End	0.200	**6**	**25**		**50**
				122.085				

APPENDIX G

LOW VOLUME ROADS

Rural Low Volume Roads AADT<50

Name	From	To	Section #	Length	Road Environment	Current AADT (EST#)
Burnt Depot Road	Gaffney Road	200m East of Gaffney Road	RD430	0.200	R	5
Paplinskie Road	Highway 60	Civic #221	RD500	1.000	R	39
Madawaska Avenue	Post Street	Madawaska Street	RD310	0.050	R	0
Madawaska Street	Algonquin Street	End	RD320	1.000	R	40
Dave Bowers Road	Hay Creek Road	0.1 km west of Hay Creek Road	RD120	0.100	R	20
Lakeshore Avenue	Hay Creek Road	Third Street	RD160	0.600	R	30
Paradise Road	1.1 km south of Highway 60	End	RD230	1.300	R	5
Airy Road	Highway 60	0.9km west of Highway 60	RD010	0.900	R	10
Airy Road	0.9 km west of Highway 60	1.2 km west of Highway 60	RD020	0.300	R	10
Sunset Trail	Maple Drive	End	RD050	0.600	R	40
McKenzie Lake Road	Highway 127	Proven Line	RD730	1.580	R	45
McKenzie Lake Road	Proven Line	North McKenzie Lake Road	RD732	2.460	R	45
North McKenzie Lake Road	Civic #681 (Moosemeat Archery)	Henry Coglan Drive	RD752	2.800	R	36
North McKenzie Lake Road	McKenzie Lake Rd.	Civic #681 (Moosemeat Archery)	RD750	3.410	R	36
McKenzie Lake Road	North McKenzie Lake Road	South McKenzie Lake Road	RD734	3.190	R	45
Victoria Lake Road	Major Lake Road	Civic #700	RD630	3.440	R	5

Name	From	To	Section #	Length	Road Environment	Current AADT (EST#)
Gaffney Road	Moonlight Bay Road	Burnt Depot Road	RD424	3.870	R	21
Gaffney Road	Aylen Lake Road	Moonlight Road	RD420	0.810	R	21
North Aylen Lake Road	Chapel Lane	Ferndale Lane	RD463	2.080	R	43
North Aylen Lake Road	Aylen Lake	Chapel Lane	RD460	3.320	R	43
Old Highway 127	Highway 60	Highway 127	RD390	5.530	R	38
Gaffney Road	Burnt Depot Road	End	RD428	0.620	R	21
Burnt Depot Road	200m East of Gaffney Road	End	RD435	0.300	R	5
Moonlight Bay Road	Gaffney Road	End	RD440	2.200	R	5
Whites Road	Aylen Lake Road	End	RD450	0.700	R	5
North Aylen Lake Road	Ferndale Lane	End	RD466	2.310	R	43
Pringles Road	North Aylen Lake Road	End	RD470	0.670	R	10
Shields Road	North Aylen Lake Road	End	RD480	0.160	R	10
Old Farm Road	Aylen Lake North Road	End	RD490	0.310	R	5
Paplinskie Road	Civic #221	End	RD505	1.100	R	39
Dunnes Road	Highway 60	End	RD510	2.100	R	10
Fire Route - Pump House	Major Lake Road	End	RD590	0.150	R	20
Victoria Lake Road	Civic #700	End	RD635	2.510	R	5
McCauley Lake Road	Major Lake Road	End	RD640	3.150	R	11
Reids Road	Highway 523	End	RD660	0.100	R	20
Lyell Lake Landing Road	Highway 523	End	RD670	0.400	R	30

Name	From	To	Section #	Length	Road Environment	Current AADT (EST#)
McGuey Road	Civic #471	End	RD685	1.970	R	44
McRae-Hay Lake Road (PA)	2.4km West of Highway 127 (Civic 510)	McRae-Hay Lake Road (UP)	RD690	2.000	R	19
McRae-Hay Lake Road (UP)	North Road	End	RD700	2.480	R	19
Bennett Road	McRae-Hay Lake Road	End	RD710	2.360	R	5
McKenzie Lake Road	South McKenzie Lake Road	Highway 127	RD736	1.560	R	45
South McKenzie Lake Road	McKenzie Lake Road	End	RD740	2.600	R	5
North McKenzie Lake Road	Henry Coglan Drive	End	RD755	2.310	R	36
Tom and Mick Murray Park Road	Highway 523	End	RD600	0.670	R	5
Henry Coglan Drive	North McKenzie Lake Road	End	RD760	1.900	R	5
Proven Line	McKenzie Lake Road	Pastwa Lake Road	RD770	1.720	R	10
Pastwa Lake Road	Proven Line	2.7 km East of Proven Line	RD780	2.400	R	10
Pastwa Lake Road	2.7 km East of Proven Line	End	RD785	3.080	R	5
Kuiack Road	Pastwa Lake Road	End	RD790	0.500	R	1
McRae-Hay Lake Road (PA)	Highway 127	2.4km West of Highway 127 (Civic 510)	RD691	2.400	R	19
McGuey Road	Highway 127	Civic# 471	RD680	2.370	R	44
51				85.640		

APPENDIX H

LOW VOLUME ROADS COSTING

Low Volume Road Needs (AADT < 50)

Sec. #	Name	From	To	Length	Priority Guide	Surf	Type of Improvement	Time of Improvement	Total Cost
RD466	North Aylen Lake Road	Ferndale Lane	End	2.310	**20.6**	G/S	REC	Maintenance	$1,554,678.96
RD460	North Aylen Lake Road	Aylen Lake	Chapel Lane	3.320	**19.4**	G/S	REC	Maintenance	$2,234,430.36
RD463	North Aylen Lake Road	Chapel Lane	Ferndale Lane	2.080	**19.3**	G/S	REC	Maintenance	$1,399,884.08
RD500	Paplinskie Road	Highway 60	Civic #221	1.000	**17.2**	G/S	REC	Maintenance	$673,021.19
RD160	Lakeshore Avenue	Hay Creek Road	Third Street	0.600	**13.0**	G/S	REC	Maintenance	$403,812.72
RD428	Gaffney Road	Burnt Depot Road	End	0.620	**9.7**	G/S	REC	Maintenance	$417,273.14
RD700	McRae-Hay Lake Road (UP)	North Road	End	2.480	**9.3**	G/S	REC	Maintenance	$1,669,092.56
RD120	Dave Bowers Road	Hay Creek Road	0.1 km west of Hay Creek Road	0.100	**8.2**	G/S	REC	Maintenance	$67,302.12
RD690	McRae-Hay Lake Road (PA)	2.4km West of Highway 127 (Civic 510)	McRae-Hay Lake Road (UP)	2.000	**6.3**	LCB	REC	Maintenance	$1,500,183.11
RD510	Dunnes Road	Highway 60	End	2.100	**5.6**	ETH	REC	Maintenance	$1,413,344.51
RD020	Airy Road	0.9 km west of Highway 60	1.2 km west of Highway 60	0.300	**5.4**	G/S	REC	Maintenance	$201,906.36
RD785	Pastwa Lake Road	2.7 km East of Proven Line	End	3.080	**4.3**	ETH	REC	Maintenance	$2,072,905.28
RD490	Old Farm Road	Aylen Lake North Road	End	0.310	**3.5**	ETH	REC	Maintenance	$208,636.57
RD710	Bennett Road	McRae-Hay Lake Road	End	2.360	**3.3**	G/S	REC	Maintenance	$1,588,330.02
RD435	Burnt Depot Road	200m East of Gaffney Road	End	0.300	**3.1**	G/S	REC	Maintenance	$201,906.36
RD600	Tom and Mick Murray Park Road	Highway 523	End	0.670	**2.7**	G/S	REC	Maintenance	$334,017.93

Sec. #	Name	From	To	Length	Priority Guide	Surf	Type of Improvement	Time of Improvement	Total Cost
RD790	Kuiack Road	Pastwa Lake Road	End	0.500	**0.4**	G/S	REC	Maintenance	$336,510.60
				24.130					**$16,277,235.85**

APPENDIX I

SCHEDULE OF UNIT PRICES

Estimated 2022 Construction Unit Prices

Item	Desciption		Unit Price	
1	Excavation	$	15.00	**/ m^3**
2	Hot Mix	$	170.00	**/ tonne**
3	Granular A	$	25.00	**/ tonne**
4	Granular B	$	22.00	**/ tonne**
5	Concrete Base Placed	$	300.00	**/ m^3**
6	Curb And Gutter Removed	$	40.00	**/ m**
7	Curb And Gutter Placed	$	160.00	**/ m**
8	Subdrain Placed	$	35.00	**/ m**
9	Storm Sewer Placed	$	350.00	**/ m**
10	Catch Basin Leads Placed	$	300.00	**/ m**
11	Manholes Removed	$	1,000.00	**ea.**
12	Manholes Placed	$	6,500.00	**ea.**
13	Catch Basins Removed	$	500.00	**ea.**
14	Catch Basins Placed	$	4,500.00	**ea.**
15	Adjust Manholes	$	1,200.00	**ea.**
16	Adjust Catch Basins	$	1,200.00	**ea.**
17	Asphalt Planing (Cross Fall Correction)	$	6.00	**/ m^2**
18	In-Place Processing (Asphalt Pulverizing)	$	3.00	**/ m^2**
19	Single Surface Treatment	$	6.00	**/ m^2**
20	Double Surface Treatment	$	10.00	**/ m^2**
21	Partial Depth Removal (Milling)	$	3.00	**/ m^2**

APPENDIX J

RATE OF SPEED

Municipal Act, 2001 S.O. 2001, CHAPTER 25

PART I

GENERAL

Interpretation

1 (1) In this Act,

"local municipality" means a single-tier municipality or a lower-tier municipality; ("municipalité locale")

Highway Traffic Act, R.S.O. 1990

Interpretation, general

Definitions

1 (1) In this Act,

"built-up area" means a territory contiguous to a highway not within a local municipality, other than a local municipality that had the status of a township on December 31, 2002 and, but for the enactment of the Municipal Act, 2001, would have had the status of a township on January 1, 2003, where,

(a) not less than 50 per cent of the frontage upon one side of the highway for a distance of not less than 200 metres is occupied by dwellings, buildings used for business purposes, schools or churches,

(b) not less than 50 per cent of the frontage upon both sides of the highway for a distance of not less than 100 metres is occupied by dwellings, buildings used for business purposes, schools or churches, or

(c) not more than 200 metres of the highway separates any territory described in clause (a) or (b) from any other territory described in clause (a) or (b),

and signs are displayed as required by the regulations; ("agglomération")

PART IX

RATE OF SPEED

Rate of speed

128 (1) No person shall drive a motor vehicle at a rate of speed greater than,

(a) 50 kilometres per hour on a highway within a local municipality or within a built-up area;

(b) despite clause (a), 80 kilometres per hour on a highway, not within a built-up area, that is within a local municipality that had the status of a township on December 31, 2002

and, but for the enactment of the Municipal Act, 2001, would have had the status of a township on January 1, 2003, if the municipality is prescribed by regulation;

(b.1) 80 kilometres per hour on a highway not within a local municipality or within a built-up area;

(c) 80 kilometres per hour on a highway designated by the Lieutenant Governor in Council as a controlled-access highway under the Public Transportation and Highway Improvement Act, whether or not the highway is within a local municipality or built-up area;

(d) the rate of speed prescribed for motor vehicles on a highway in accordance with subsection (2), (5), (6), (6.1) or (7); or

(e) the maximum rate of speed set under subsection (10) and posted in a construction zone designated under subsection (8) or (8.1).

(f) REPEALED: 2019, c. 8, Sched. 1, s. 24.

2005, c. 26, Sched. A, s. 17 (1); 2006, c. 11, Sched. B, s. 6 (2); 2006, c. 32, Sched. D, s. 4 (1); 2019, c. 8, Sched. 1, s. 24; 2021, c. 26, Sched. 1, s. 10.