ROADWAY EVALUATION & ASSET MANAGEMENT PLAN 2022

Roadway Evaluation & Asset Management Plan 2022

1. INTRODUCTION

TBT Engineering Limited (TBTE) has been retained by the Town of Marathon (Marathon) to conduct a pavement and roadway evaluation in support of an Asset Management Plan of the Town's roadway resources. The Town supplied TBTE with a list of Municipal Roads which was used to separate the roads into individual sections. For the purposes of this Asset Management Plan, TBTE has identified 61 Municipal Roads consisting of 73 road sections of flexible pavement totaling 31.6 km and 4 road sections of gravel totaling 0.9 km for a total of 77 road sections totaling 32.5 km. TBTE conducted a detailed field review of the identified roadway sections on October 4th and 5th of 2022.

The purpose of the study is to update the road inventory and appraise the physical condition of each road section, estimate current surface replacement costs, and estimate the remaining surface life to assist in future road restoration and budgetary planning.

Traffic data was supplied by Marathon and has been used in the formation of the Asset Management Plan to assess the vehicular traffic volumes and classification of each roadway section. The Town of Marathon had previously conducted a Pavement Evaluation of their roadway network in the Summer of 2022.

2. EVALUATION CRITERIA

TBTE compiled an inventory of the Town of Marathon's roadway network and associated infrastructure. The road system was subdivided into sections by road name and surface type that exhibited uniform performance characteristics. These sections may have differed slightly from those previously detailed due to recent construction improvements, surface types, age, and system efficiency. These road sections were evaluated with consideration of the importance to Marathon.

A comprehensive visual field investigation assessing the existing conditions was conducted for each road section and detailed using the Pavement Evaluation and Performance condition rating scheme used in Ontario by the Ministry of Transportations for flexible pavement and gravel roads.

2.1. Section Number (Asset Number)

An arbitrary section number or asset number has been assigned to each section of roadway for recording purposes. The asset numbering system is designed to differentiate between different surface types and/ or to split roads into critical sections along the same roadway.

For example, a road section has been named: Section No. *R-001-01 – Penn Lake Rd E.*
A prefix of 'R' was used for "Road", followed by a 3-digit number to identify the particular road, followed by a 1-digit number to identify the road section. The 3-digit number will allow for up to 999 different items (in this case roads) followed by the 2-digit number allowing for up to 99 different sections with the same road name; a 0 number in this location would indicate that there are no other sections with the same road name.

2.2. Section Length

Roadway sections and lengths were primarily determined for each roadway by Road Name. Secondary divisions within each roadway name were by surface type with tertiary divisions considered if performance and physical conditions / estimated age differed significantly within the secondary sections. Additionally, consideration of individual section length and traffic capacity was taken when dividing roadways into sections.

2.3. Section Surface Age

Section surface age is one factor used in predicting the timing of deferred maintenance strategies and potential rehabilitation. For the sections where the surface age is not known, ages have been estimated using general surface condition and roadway appearance as a guide. Additionally, TBTE utilized historical Google Earth imagery to estimate the surface age. A maximum surface age of 15 years has been used as a basis for this review.

2.4. Traffic Volumes / Vehicle Usage

TBTE utilized the traffic data provided by the Town of Marathon to assist in determining the traffic capacity of each roadway section. Where traffic data was unavailable, TBTE assumed a volume based on location (main artery, sideroad, subdivision road). For the purpose of this Asset Management Plan a rating system of Low, Medium, and High was used to measure each section's standing within the roadway network.

2.5. Open Drainage Ditches

During the field review, the condition of open drainage ditches adjacent to the roadways was observed and noted. Generally, the ditching, where present, was in good shape within the Road Network. In select areas, portions of the ditches appeared to be overgrown with vegetation which can cause drainage impediment leading to premature pavement failure. A large number of roads do not contain any drainage features at all. Where this is the case, the majority of roads were noted to be in poor condition.

2.6. Physical Condition Rating (PCR)/ Riding Condition Rating (RCR)

The Riding Condition Rating (RCR) is a subjective ride quality as perceived by the travelling public. The method of measurement is determined by driving the road section at the posted speed and assigning a rating based on the table on the evaluation form.

Upon the infield examination of each section of roadway the distresses were observed, rated, and subjectively combined with the RCR to produce the Pavement Condition Rating (PCR). The roadway evaluator followed the procedures given in the MTO's Pavement Design and Rehabilitation Manual to evaluate the roughness and distress of the pavement.

The establishment of the RCR and PCR was done by qualified staff. The method applied was similar to the method used by MTO to rate the provincial highway system and as recommended by the Asphalt Institute to evaluate pavement condition.

This procedure to determine the PCR is endorsed by both the Ontario Good Roads Association and the Ministry of Municipal Affairs and Housing (MMAH). The results can be used as indicators for reporting purposes for the Municipal Performance Measurement Program.

Subsequently, the PCR was used as a decision tool to determine the time of reconstruction required for each road section, i.e., adequate, 6-10 years, 1-5 years, or NOW.

Additionally, a Pavement Condition Index (PCI) was calculated for each road section. A PCI is calculated by inserting the Distress Manifestation Index (DMI) and RCR into a prescribed formula. Typically for a PCI, the roughness data (DMI) is obtained through machine measuring devices (such as ARAN technology). For this report, the PCI was used as a check of the subjectively assigned PCR.

2.7. Current Surface Reconstruction Value

The Current surface reconstruction value is a measure of the approximate reconstruction costs for the roadway segment. A basic pavement reconstruction strategy of In-Place Processing and Paving with 50 mm of SuperPave 12.5 has been utilized for the roadway sections where open drainage ditches are present. For roadway sections where existing curb and gutter is present, a strategy of Full Depth Asphalt Removal and paving with 50 mm SuperPave 12.5 has been used. In-Place Processing is not feasible where curb and gutter is present due to grade increases not matching existing gutter elevations.

An additional 50 mm asphalt binder course (totaling 100 mm hot-mix asphalt) is recommended for higher volume roads. For the purposes of this study TBTE has applied this recommendation to the following roadways:

- Peninsula Road
- Hemlo Drive - From Peninsula Rd to Steedman Dr. (Sections R-031-01 & R-031-02)
- Stevens Avenue - From Trailer Park St to Winton St. (Sections R-060-02 & R-060-03)

It is recommended a comprehensive Pavement Design evaluation including geotechnical field investigations be advanced prior to completing the reconstruction to confirm the recommended design pavement strategy and asphalt thicknesses. The investigations can also be utilized to investigate poorly performing areas.

The present-day reconstruction costing has been estimated using unit rates for the recent reconstruction of Nicolet St and Steedman Dr. The unit rates utilized for Major Items are listed below and include labour and placement costs.
For costing purposes, it is assumed that the entire length of ditching will require cleanout at the time of reconstruction.

Table 1.0 – Major Item Unit Rates

Item	Rate	Unit
Earth Ditch C/O	$ 49.70	/m
Superpave 12.5 (50mm)	$ 24.60	/m^2
Gran A	$ 45.60	/t
IPP	$ 5.30	/m^2
Asphalt Removal	$ 17.80	/m^2
Traffic Control	$ 60,756.00	/Km
Mob/Demob	$ 50,000.00	/Road
Contingency	$100,000.00	/Km

2.7.1. Costing Considerations

For the purposes of this study, a separate cost estimate for the Major Items (listed above) as well as the Total Construction cost has been provided. The Total Construction cost includes estimates for the following items, in addition to the major items:

- Culvert replacements,
- Curb and gutter removal and installation,
- Sidewalk replacements,
- Catch basins,
- Pavement markings,
- Miscellaneous Items

2.8. Recent Reconstruction Projects

During the field review, there were three roadway sections containing recently reconstructed pavement that did not extend for the entire length of the section. The corresponding evaluations and reconstruction costs at these locations are based on the old pavement surfaces and lengths.

A summary of these roads can be found below.

Table 2.0 – Recently Reconstructed Roadway Summary

Road	Description	Total Length (m)	Length of Roadway Segment not Reconstructed (m)
Steedman Dr	Hemlo Dr to Birch St	700	500
Ontario St	Peninsula Rd to Peninsula Rd	520	320
Whitman Ct	Start of Road W to Stevens Ave	240	100

3. DISCUSSIONS & RECOMMENDATIONS

The attached work sheets and summary table below provide further detail of the deferred maintenance requirements and current surface replacement values.

3.1. Capital Improvement/ Investment Plan

Ideally, an appropriate type of road improvement and associated cost to all road sections should be determined. This would allow the Town of Marathon to develop a continuing 5-year improvement program in conjunction with an annual field review and reassessment of the appropriate road sections. TBTE has assessed and provided planning level reconstruction cost estimates for each road section in the NOW, 1 to 5 years, and 6-to-10-year improvement categories. The estimated cost of recommended reconstruction strategies for the appropriate road sections has been included in the Road Section Summary Table appended in Enclosure A. This will provide the Town of Marathon with the means for the development of a 10-year road improvement plan based on needs, local priorities, and available funding. At the request of the Client, the roadways in the 1-to-5-year range have been further broken down into specific years (i.e., NOW, 2, 3, 4, and 5 years). A roadway map has been produced illustrating reconstruction priority throughout the roadway network and can be found in Enclosure B.

Table 3.0 should be read in conjunction with the attached work sheets for reference to the recommended rehabilitation proposed for each section.

Table 3.0 – Capital Improvement/ Investment Plan Summary Table

Deferred Maintenance	Number of Road Sections	Surface Type	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
NOW - Full Rehabilitation	**5**	Flexible	$2,421,301.00	$3,954,310.00
	0	Gravel	$0.00	$0.00
		Subtotal	**$2,421,301.00**	**$3,954,310.00**
1 - 5 Year Deferred Maintenance	**24**	Flexible	$6,117,591.90	$9,990,851.74
	1	Gravel	$85,215.60	$139,168.56
		Subtotal	**$6,202,807.50**	**$10,130,020.29**
6 - 10 Year Deferred Maintenance	**16**	Flexible	$4,813,394.52	$7,860,921.72
	1	Gravel	$51,687.80	$84,413.14
		Subtotal	**$4,865,082.32**	**$7,945,334.86**
TOTAL:			**$13,489,190.83**	**$22,029,665.15**

3.2. Potential Surface Condition Upgrade

If additional funding becomes available to commence a surface upgrade program, above and beyond the recommended maintenance requirements, it is recommended that the following be considered.

- ✓ For the determination of roadways which warrant surface upgrades, it is recommended that the Town of Marathon establish a maintenance costing program which tracks actual maintenance costs per kilometer for each road section, enabling an annual review for comparison purposes between differing roadways and differing surface types. This maintenance costing program should provide indication of which sections are of highest maintenance demand and where an upgraded surface treatment may provide deferred maintenance requirements.

- ✓ As part of the Town of Marathon review, it is recommended that the public's input be considered when upgrading options are being designed (e.g., functionality, site distances, stone chips, excessive dust, etc.).

- ✓ Potential growth and projected uses should form an integral part of the upgrade decision process.

- ✓ Drainage culverts and ditching form an integral part of the roadway system. It is recommended that a thorough review of the existing culverts be considered as part of the upgrade decision process. Ensuring adequate drainage of roadbed granulars and the capture of surface water is a key component to roadway rehabilitation. Wet subgrade and roadbed granulars can reduce the structural strength and load carrying capacity of the roadbed resulting in reduced performance and surface life. Drainage restoration should be carried out as part of the road section rehabilitation at the time or in advance of reconstruction. OPSD 200.010 could be used as a guide.

- ✓ It is recommended that the granular pavement structure be investigated prior to upgrading to ensure acceptable granular subbase and base course components are present as well as a detailed drainage assessment. An assessment of the existing vertical and horizontal alignments should be carried out to ensure the minimum standards are met, where speed limits and traffic volumes are warranted.

Various alternatives are available for improving gravel surfaced roadways. The following are some general treatments typically applied on Municipal roadways:

(Initial construction cost increasing)

- ➢ Calcium Chloride - improved dust suppression and surface stabilization (seasonal)

- Surface Treatment & Double Surface Treatment – minimizes dust, surface stabilization, lowers regular maintenance requirements, longer term surface, requires competent granular pavement structure and effective drainage features.

4.0 CLOSURE

We trust the above meets your current requirements. Should you have any questions, please feel free to contact the undersigned.

Prepared By,

Hunter Galloway, P. Eng.,
Project Engineer
Pavement Engineering Services

Sam Molendijk, P. Eng.,
Manager of Pavement Engineering Services

Enclosure A

Road Section Summary Table

Section Number	Name of Road Section	Description	Priority Rating	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
R-009-00	Lynx Ln	Penn Lake Rd E to Hemlo Dr	Now - Full Rehabilitation	$117,333	$191,621
R-028-00	Spruce Cr	Aspendale Dr W to Sund Cr	Now - Full Rehabilitation	$130,472	$213,078
R-045-01	Howe St	Start of Road W (Playground) to Yawkey Ave	Now - Full Rehabilitation	$142,829	$233,259
R-060-02	Stevens Ave	Trailer Park St to Peninsula Rd	Now - Full Rehabilitation	$1,588,340	$2,593,973
R-001-01	Penn Lake Rd E	Peninsula Rd to Lynx Ln	Now - Full Rehabilitation	$442,327	$722,379
R-059-02	Yawkey Ave	13 Yawkey St to Brown St	2 years - Restore drainage & Surface	$249,382	$407,275
R-004-01	Chisholm Trail	Penn Lake Rd E to Pinewood Walk	2 years - Restore drainage & Surface	$316,767	$517,323
R-031-04	Hemlo Dr	Approx. 50m south of Laverendrye Cr S to End of Road S	2 years - Restore drainage & Surface	$372,849	$608,913
R-030-00	Michano Dr	Hemlo Dr to End of Road S	2 years - Restore drainage & Surface	$324,053	$529,223
R-037-00	Manitoba St	Start of Road N to Ontario St	3 years - Restore drainage & Surface	$124,256	$202,926
R-025-02	Steedman Dr	Birch St to End of Road N	3 years - Restore drainage & Surface	$208,005	$339,700
R-019-00	Lloyd Irwin St	Steedman Dr to Michano Dr	3 years - Restore drainage & Surface	$224,371	$366,429
R-055-00	Whitman Ct	Start of Road W to Stevens Ave	3 years - Restore drainage & Surface	$121,207	$197,947
R-022-01	Birch St	Steedman Dr to Michano Dr	3 years - Restore drainage & Surface	$225,504	$368,279
R-036-00	Ontario St	Pensinsula Rd to Peninsula Rd	3 years - Restore drainage & Surface	$227,280	$371,179
R-011-00	Jackson Cr	Hemlo Dr to Hemlo Dr	3 years - Restore drainage & Surface	$432,909	$706,998
R-039-00	Armour St	Yawkey Ave to Stevens Ave	4 years - Restore drainage & Surface	$186,792	$305,057
R-020-00	McFarland St	Steedman Dr to Michano Dr	4 years - Restore drainage & Surface	$227,384	$371,349
R-059-03	Yawkey Ave	Brown St to Stevens Ave	4 years - Restore drainage & Surface	$546,359	$892,278
R-012-00	Bastedo Cr	Hemlo Dr to Hemlo Dr	4 years - Restore drainage & Surface	$405,202	$661,750
R-022-02	Birch St	Steedman Dr to Sund Cr	4 years - Restore drainage & Surface	$116,955	$191,003
R-038-00	Alberta St	Ontario St to End of Road W	5 years - Restore drainage & Surface	$85,216	$139,169

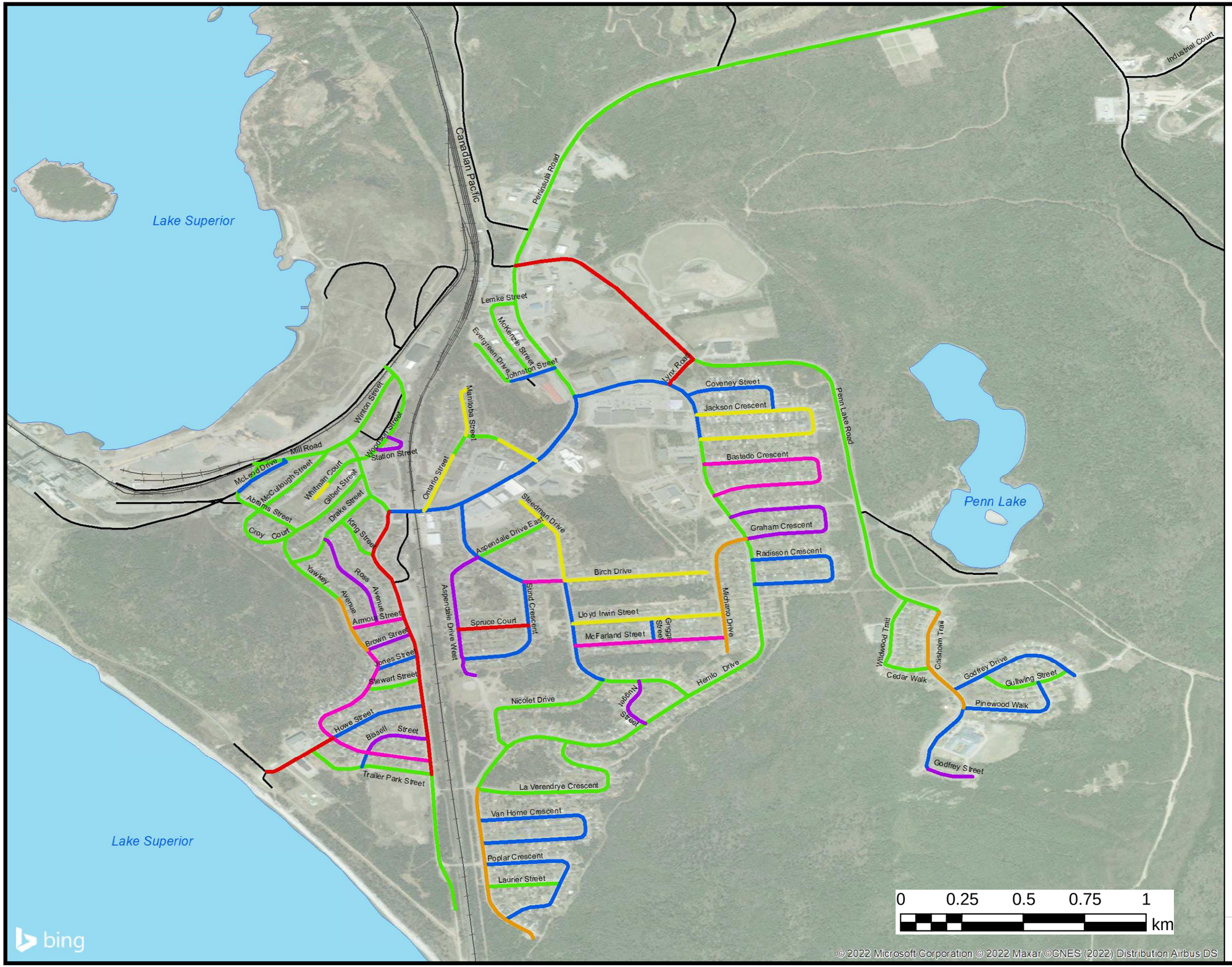
Section Number	Name of Road Section	Description	Priority Rating	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
R-048-00	Ross Ave	Drake St to Armour St	5 years - Restore drainage & Surface	$349,367	$570,563
R-058-00	Station St	Woodson St to Woodson St	5 years - Restore drainage & Surface	$182,821	$298,571
R-040-00	Brown St	Yawkey Ave to Stevens Ave	5 years - Restore drainage & Surface	$175,041	$285,866
R-023-00	Nugget St	Steedman Cr to Hemlo Dr	5 years - Restore drainage & Surface	$121,627	$198,634
R-005-00	Godfrey St	Chisholm Trail to End of Road E	5 years - Restore drainage & Surface	$133,988	$218,820
R-013-00	Graham Cr	Hemlo Dr to Hemlo Dr	5 years - Restore drainage & Surface	$352,539	$575,743
R-043-01	Bissell St	Yawkey Ave to Stevens Ave	5 years - Restore drainage & Surface	$223,989	$365,804
R-027-00	Aspendale Dr W	Sund Cr to End of Road S	5 years - Restore drainage & Surface	$268,946	$439,225
R-021-00	Griggs St	Lloyd Irwin St to McFarland St	6 - 10 years - normal maintenance (Spot Repairs as required)	$85,320	$139,339
R-043-02	Bissell St	Yawkey Ave to Trailer Park St	6 - 10 years - normal maintenance (Spot Repairs as required)	$51,688	$84,413
R-041-00	Jones St	Yawkey Ave to Stevens Ave	6 - 10 years - normal maintenance (Spot Repairs as required)	$166,411	$271,772
R-010-00	Coveney St	Hemlo Dr to Jackson Cr	6 - 10 years - normal maintenance (Spot Repairs as required)	$212,694	$347,358
R-004-02	Chisholm Trail	Pinewood Walk to Godfrey St	6 - 10 years - normal maintenance (Spot Repairs as required)	$230,336	$376,170
R-031-01	Hemlo Dr	Peninsula Rd to Jackson Cr S	6 - 10 years - normal maintenance (Spot Repairs as required)	$474,524	$774,962
R-045-02	Howe St	Yawkey Ave to Stevens Ave	6 - 10 years - normal maintenance (Spot Repairs as required)	$273,584	$446,800
R-061-01	Peninsula Rd	Stevens Ave to Hemlo Dr	6 - 10 years - normal maintenance (Spot Repairs as required)	$697,410	$1,138,964
R-006-00	Pinewood Walk	Chisholm Trail to Gullwing St	6 - 10 years - normal maintenance (Spot Repairs as required)	$237,861	$388,458
R-008-00	Godfrey Dr	Chisholm Trail to Gullwing St	6 - 10 years - normal maintenance (Spot Repairs as required)	$269,899	$440,782
R-035-00	Johnston St	Evergreen Dr to Peninsula Rd	6 - 10 years - normal maintenance (Spot Repairs as required)	$133,111	$217,389
R-051-00	McLeod Dr	Abrams St to Winton St	6 - 10 years - normal maintenance (Spot Repairs as required)	$186,463	$304,519
R-017-00	Poplar Cr	Hemlo Dr to Hemlo Dr	6 - 10 years - normal maintenance (Spot Repairs as required)	$321,430	$524,938
R-014-00	Radisson Cr	Hemlo Dr to Hemlo Dr	6 - 10 years - normal maintenance (Spot Repairs as required)	$326,950	$533,954

Section Number	Name of Road Section	Description	Priority Rating	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
R-029-00	Sund Cr	Peninsula Rd to Aspendale Dr W	6 - 10 years - normal maintenance (Spot Repairs as required)	$425,394	$694,725
R-025-01	Steedman Dr	Hemlo Dr to Birch St	6 - 10 years - normal maintenance (Spot Repairs as required)	$394,457	$644,202
R-016-00	Van Horne Cr	Hemlo Dr to Hemlo Dr	6 - 10 years - normal maintenance (Spot Repairs as required)	$377,551	$616,591
R-044-00	Trailer Park St	Howe St to Stevens Ave	10 years + - Normal maintenance	$219,349	$358,226
R-060-01	Stevens Ave	Start of Road S to Trailer Park St	10 years + - Normal maintenance	$295,651	$482,839
R-060-03	Stevens Ave	Peninsula Rd to Winton St	10 years + - Crack Sealing Year 3 - 5	$541,977	$885,122
R-015-00	La Verendrye Cr	Hemlo Dr to Hemlo Dr	10 years + - Crack Sealing Year 3 - 5	$372,568	$608,454
R-018-00	Laurier St	Hemlo Dr to Poplar Cr	10 years + - Crack Sealing Year 3 - 5	$159,074	$259,789
R-061-02	Peninsula Rd	Hemlo Dr to Penn Lake Rd E	10 years + - Crack Sealing Year 3 - 5	$514,788	$840,718
R-002-00	Wildwood Trail	Penn Lake Rd E to Cedar Walk	10 years + - Crack Sealing Year 3 - 5	$222,794	$363,853
R-007-00	Gullwing St	Godfrey Dr to Godfrey Dr	10 years + - Crack Sealing Year 3 - 5	$200,980	$328,228
R-003-00	Cedar Walk	Wildwood Trail to Chisholm Trail	10 years + - Crack Sealing Year 3 - 5	$131,511	$214,775
R-033-00	McKenzie St	Lemcke St to Johnston St	10 years + - Crack Sealing Year 3 - 5	$180,836	$295,330
R-034-00	Evergreen Dr	Start of Road N to Johnston St	10 years + - Crack Sealing Year 3 - 5	$138,218	$225,728
R-050-00	Abrams St	Croy Ct to McLeod Dr	10 years + - Crack Sealing Year 3 - 5	$248,799	$406,323
R-032-00	Lemcke St	Peninsula Rd to McKenzie St	10 years + - Crack Sealing Year 3 - 5	$81,648	$133,342
R-053-00	Gilbert St	Abrams St to Stevens Ave	10 years + - Crack Sealing Year 3 - 5	$281,147	$459,151
R-061-03	Peninsula Rd	Penn Lake Rd E to Cemetery	10 years + - Crack Sealing Year 3 - 5	$1,540,730	$2,516,220
R-059-01	Yawkey Ave	Croy Ct to 13 Yawkey St	10 years + - Crack Sealing Year 3 - 5	$255,269	$416,889
R-031-03	Hemlo Dr	Steedman Dr to approx. 50 m south of Laverendrye Cr S	10 years + - Normal maintenance	$492,245	$803,902
R-024-00	Nicolet Dr	Steedman Cr to Hemlo Dr	10 years + - Normal maintenance	$325,969	$532,350
R-061-04	Peninsula Rd	Cemetery to Highway 17	10 years + - Normal maintenance	$2,335,786	$3,814,653

Section Number	Name of Road Section	Description	Priority Rating	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
R-052-00	McCullough St	Abrams St to Winton St	10 years + - Crack Sealing Year 3 - 5	$308,672	$504,103
R-049-00	Croy Ct	Abrams St to Abrams St	10 years + - Normal maintenance	$274,678	$448,585
R-056-00	Winton St	McCullough St to Woodson St	10 years + - Normal maintenance	$332,512	$543,037
R-057-00	Woodson St	Stevens Ave to Mill Entrance N	10 years + - Normal maintenance	$364,914	$595,954
R-046-00	Drake St	Yawkey Ave to Stevens Ave	10 years + - Normal maintenance	$326,434	$533,111
R-031-02	Hemlo Dr	Jackson Cr S to Steedman Dr	10 years + - Normal maintenance	$992,033	$1,620,124
R-047-00	King St	Drake St to Stevens Ave	10 years + - Normal maintenance	$189,817	$309,997
R-054-00	Mill Rd	Winton St to Mill Entrance	10 years + - Normal maintenance	$189,683	$309,778
R-001-02	Penn Lake Rd E	Lynx Ln to Chisholm Trail	10 years + - Normal maintenance	$926,428	$1,512,982
R-042-00	Stewart St	Yawkey Ave to Stevens Ave	10 years + - Normal maintenance	$181,498	$296,410
R-026-00	Aspendale Dr E	Steedman Dr to Sund Cr	10 years + - Normal maintenance	$142,583	$232,857

Enclosure B

Town of Marathon - Priority Roadway Map



Legend

- Year 1
- Year 2
- Year 3
- Year 4
- Year 5
- Year 6-10
- Year 10+
- Road - Not Evaluated
- Waterbody
- Rail Tracks

ROAD EVALUATION MAP
MARATHON, ONTARIO

Enclosure C

Town of Marathon – Road Condition Assessment

Town of Marathon

Levels of Service (Section 5(2) of Ontario Reg 588/17

As asset management practices advance in Ontario with O.Reg. 588/17, level of service (LOS) is more broadly defined to include the user experience, the design capability of the network to perform its function and the current performance of the road assets.

The level of service (LOS) condition criteria will help achieve this goal by defining current and target LOS related to condition. Then conducting a gap analysis between the target LOS condition criteria and the current condition of each road segment in the network. This information will help to prioritize and schedule roads for condition improvement which can be utilized in the decision-making process to maintain or expand the network.

Including LOS condition criteria, as part of the framework to guide decision-making, will broaden the understanding of the required investments in the road network to include maintaining the LOS and consideration of the full lifecycle of roads. There is an impact on both the operating and capital budgets and the implementation of asset management strategies to include full lifecycle of the road infrastructure.

The level of service of a road network is closely connected to the condition of the pavement. The worse the condition of the road, the lower the level of service. The condition of roads is measured by using the Pavement Condition Index (PCI) which takes into account the physical condition of the road (e.g., cracking, potholes) measured by a visual inspection. A new road is assigned a PCI of 100, and over time, as the road ages and through wear and tear, the PCI number drops to 0, which is the worst possible condition.

See **Figure 2** which illustrates how the condition of the road deteriorates over time and the lifecycle activities recommended: preventative maintenance; maintenance and rehabilitation; and reconstruction.

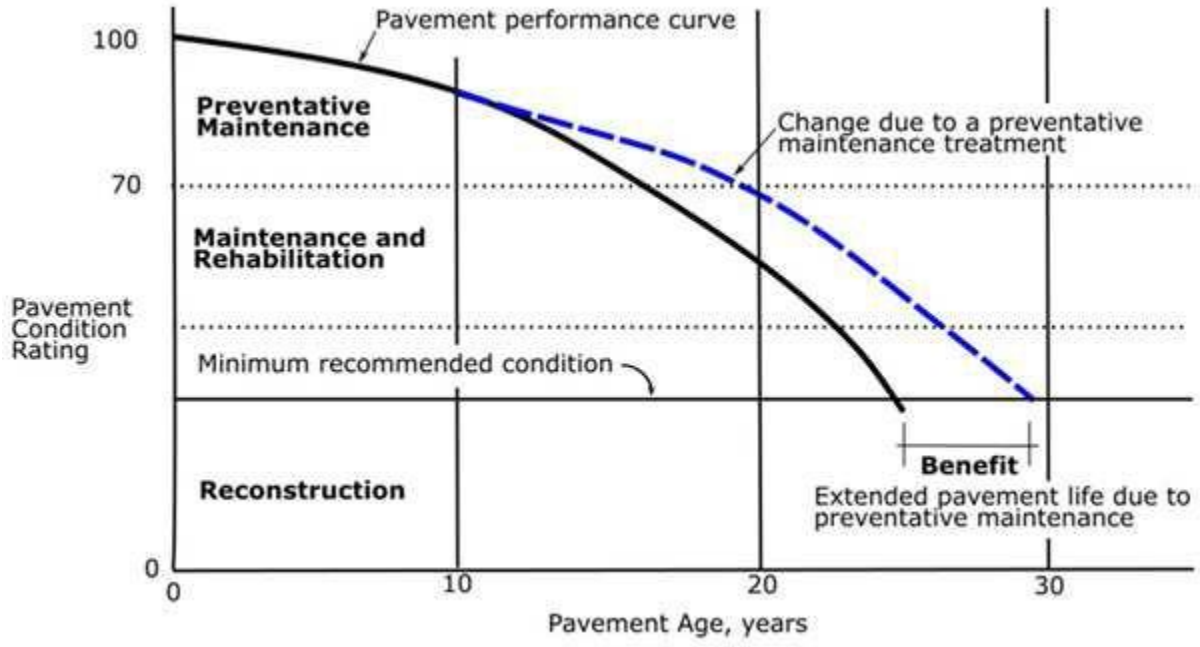


Figure 2: Pavement Condition and Lifecycle Activities

This is a common approach in asset management that reflects the decay of the asset over time. See **Table 1** with Pavement Condition Index (PCI) ranges and associated condition descriptions (ASTM D6433-90). The last column in presents a recommended 5-point scale for asset management reporting, which aligns with the Canadian Infrastructure Report Card.

Table 1: Pavement Condition Index Description Groups (American Society for Testing & Materials) ASTM D6433-90)

Pavement Condition Index (PCI)	ASTM Condition Description	Recommended 5-point scale
100 to 86	Good	Very Good
85 to 71	Satisfactory	Good
70 to 56	Fair	Fair
55 to 41	Poor	Poor
40 to 26	Very Poor	Very Poor
25 to 11	Serious	Very Poor
10 to 0	Failed	Very Poor

According to Report SP-024 published by the Ministry of Transportation (Manual for condition rating of flexible pavements – Distress manifestations), there are eight categories for flexible pavement rating as presented in **Table 2**. Pavement Condition Rating (PCR) is an assessment of overall pavement performance, both functionally and structurally. It is derived from serviceability based on evaluation of pavement riding comfort and of pavement surface distresses.

Table 2: Description of Pavement Condition Rating (MTO SP-024)

Pavement Condition Rating	Description of Pavement	Rideability Description
90 to 100	Excellent condition with few cracks	Excellent with few areas of slight distortion
75 to 90	Good condition with frequent very slight or slight cracking	Good with few slightly rough and uneven sections
65 to 75	Fairly good condition with slight cracking, slight or very slight dishing and a few areas of slight alligatoring	Fairly good with intermittent rough and uneven sections
50 to 65	Fair condition with intermittent moderate and frequent slight cracking, and with intermittent slight or moderate alligatoring and dishing	Fair and surface is slightly rough and uneven
40 to 50	Poor to fair condition with frequent moderate cracking and dishing, and intermittentmoderate alligatoring	Poor to fair and surface is moderately rough and uneven

30 to 40	Poor to fair condition with frequent moderate alligatoring and extensive moderate cracking and dishing	Poor to fair and surface is moderately rough and uneven
20 to 30	Poor condition with moderate alligatoring and extensive severe cracking and dishing	Poor and the surface are very rough and uneven
0 to 20	Poor to very poor condition with extensive sever cracking, alligatoring and dishing	Poor and surface are very rough and uneven

The comparison of the condition rating categories is presented in **Figure 3**.

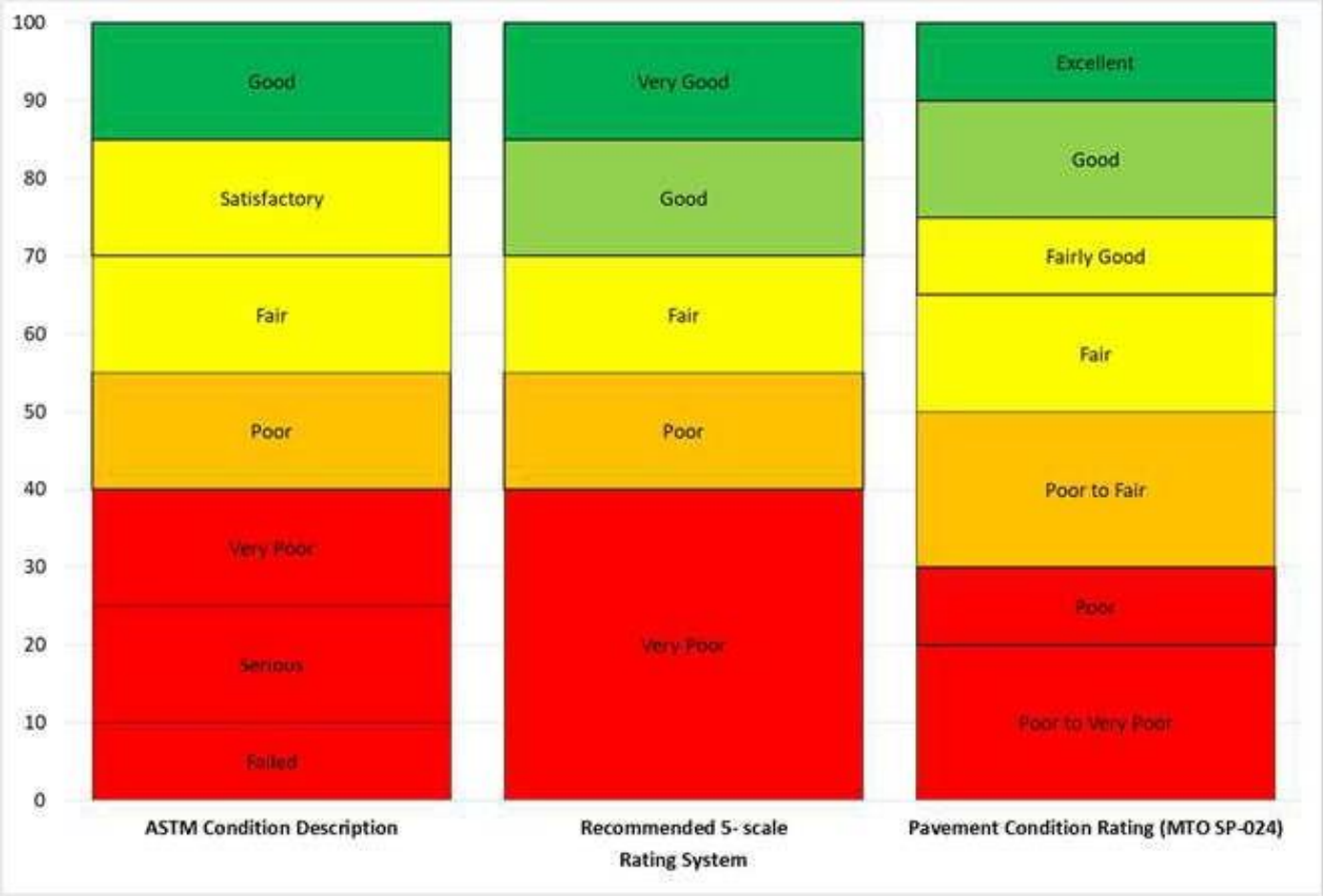


Figure 3: Comparison of the Condition Rating Categories

The new asset management regulation O.Reg. 588/17 Asset Management Planning for Municipal Infrastructure identifies levels of service as a requirement for reporting on the current service provided as well as the target level in the future. Levels of Service (LOS) description is required from the customer LOS as well as the technical LOS perspective, as well as the reporting on performance of the assets. This is illustrated in **Figure 4**.

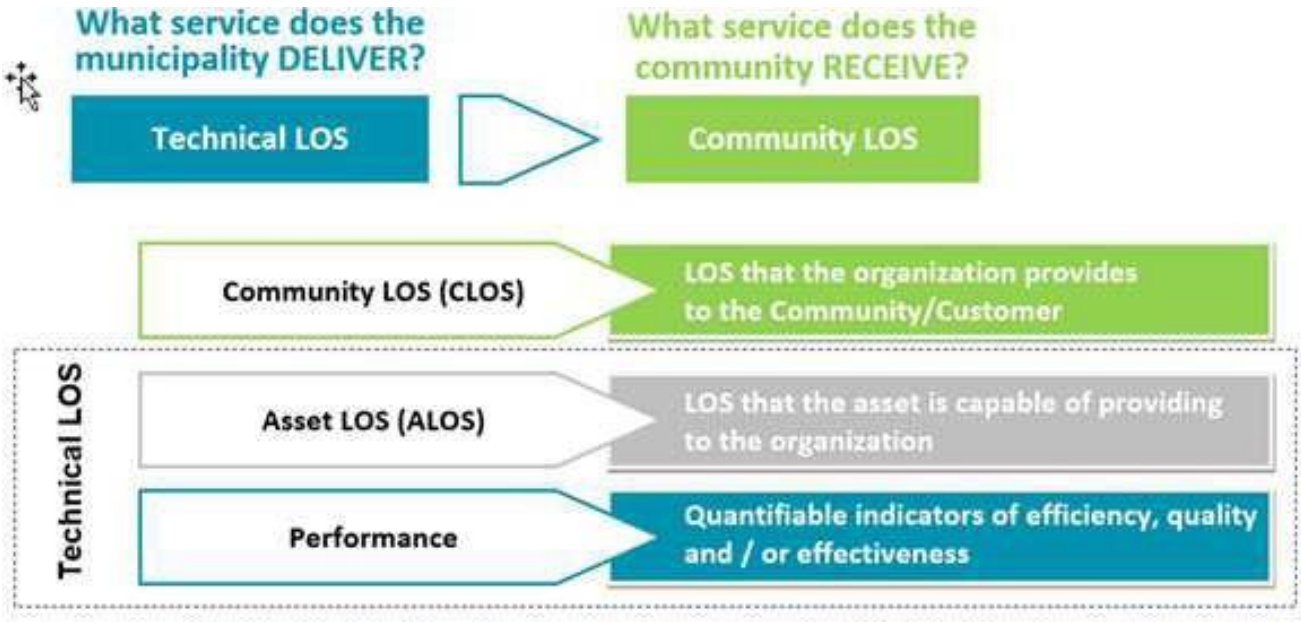


Figure 4: Levels of Service

The regulation is prescriptive on the minimum reporting on levels of service for core assets. For roads, the regulation identifies the reporting requirements stated in the regulations for scope and quality. **Table 3** illustrates highlights from the regulation.

Table 3: Levels of Service for Roads

Service Attribute	Community Levels of Service (qualitative descriptions)	Technical Levels of Service (technical metrics)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometers of each of arterial roads, collector roads and local roads as a proportion of square kilometers of land area of the municipality.
Quality	Description or images that illustrate the different levels of road class pavement condition.	1. For paved roads in the municipality, the average pavement condition index value. 2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).

Condition Rating Categories

Condition rating categories provide a framework to report to Council and the public on the current condition of the road network. The selection of which Pavement Condition Index (PCI) ratings constitute "very good" or "good", and what makes up "poor" and "very poor" is at the municipality's discretion to help organize the network and to report, as well as to identify, the strategy for maintaining the assets going forward. Five condition categories align with the Canadian Infrastructure Report Card and have been adopted as a best practice in analysis and reporting.

See **Table 5** for recommended condition descriptions that align with the ASTM categories and the MTO categories.

Table 5: Recommended Condition Categories

Pavement Condition Index (PCI)	5-Point Scale
100 to 86	Very Good
85 to 71	Good
70 to 56	Fair
55 to 41	Poor
40 to 0	Very Poor

The five-point scale can help to prioritize road segments for condition improvement and how you can take care of some things projected to be poor to move up your average number. (Roads in poor condition now will degrade faster than roads in good condition.)

Importance of Roads within the Network

A more advanced approach is to identify categories of roads such as importance (or criticality factor) for roads and to report on the average within each category. The Town of Marathon identifies roads with a higher volume to be of higher importance and establishes a target level of service (LOS) that is higher for those roads than for roads that have less traffic. Traffic counts

The class of roads are divided into sub-categories with ranking of importance and are identified by

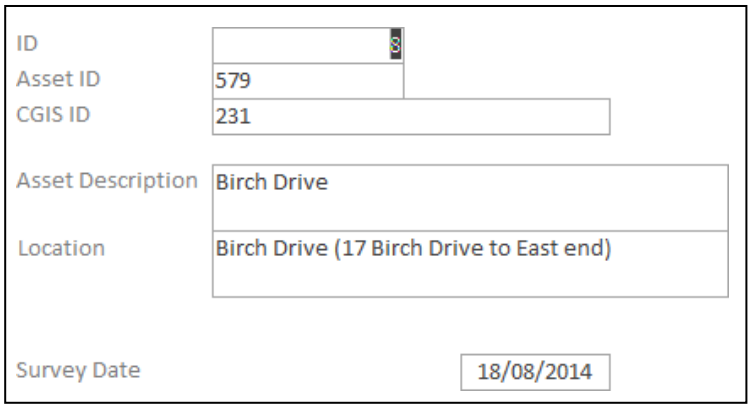
1. **Arterial (Class 3 - Orange**) – High-Capacity Road which serves to deliver traffic from collector roads to provincial highways for emergency services (EMS, Hospital, Healthcare, Police, Fire)

2. **Collector (Class 4 - Yellow)** – Moderate capacity road which serves to move traffic from local streets to arterial roads. Unlike arterials, collector roads are designed to provide access to residential properties. A collector road usually consists of a mixture of signaled intersections or stop signs, often in the form of four-way stops. Two-way stops are generally used at intersections with local streets that favor traffic movement on the collector.

3. **Residential (Class 5 - Green)** – Low-capacity Road primarily used for access to residential properties but may include access to some non-residential properties.

4. Refer to Enclosure D

There are three parts: “Road Ratings”, “Streets”, “Road Surfaces”. “Road Ratings” and “Streets” are both tables that are included in the form “Road Surfaces”. They are linked together by the Asset ID. “Road Rating Conditions” is the table where the numbers and date are held. “Streets” is the table imported from CGIS and Citywide.



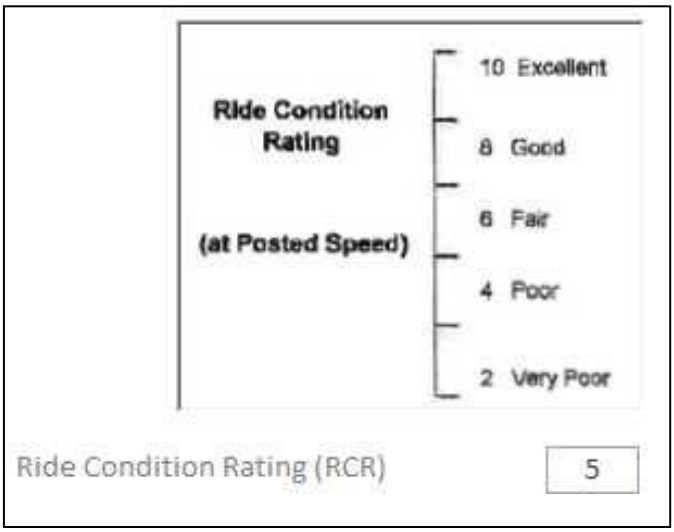


Figure 5: Ride Condition Rating

The “Severity” and “Density” fields are from 0 – 5, with “Very Slight to Very Severe” and “Few to Throughout” respectively. Each box populates a value or a 0 for the Distance measurement instrument “DMI” and Pavement Condition Index “PCI” fields

Study methodology

The study methodology followed throughout this study is the one recommended by the Ministry of Transportation, Ontario. Ontario roads are classified as rural, semi-urban and urban roads. The surface types are generally Gravel, Earth, Low Class Bituminous (LCB), and High Class Bituminous (HCB). The road sections for the Township are comprised of Gravel, LCB and HCB roads.

All the road sections were traversed several times to measure the distresses based on the following condition rating systems:

- Road Condition Rating (RCR)
- Pavement Condition Index/Rating (PCI)

The first trip on each road section was to calculate the Road Condition Rating (RCR) based on the ride quality and comfort of the roads, by driving along at the posted speed. RCR is the degree of riding comfort that the pavement provides to the travelling public. The evaluator drives along the pavement sections and rates whether the road is very smooth or a comfortable ride. With RCR, the evaluator is more concerned with the ride comfort than the appearance of the pavement. The RCR is rated from a scale 0 to 10 (Very Poor to Excellent), where a higher number means a better road, and a lower number means a worse road. The various portions of the section are picked for further investigation to calculate the Pavement Condition Index (PCI).

Once the evaluator has determined the riding condition, subsequent trips are made to identify the various pavement distresses based on visual inspection and the PCI. Here, the evaluator determines the severity and extent of each distress and assigns them separate weights and scores. The PCI is a subjectively derived rating of serviceability, based on an evaluation of pavement riding comfort and of pavement surface distresses, such as distortion, cracking, alligator cracking and so on. The PCI is assessed based on the condition of pavement with respect to the severity and extent of various distresses, and the functional and structural and structural performance of the pavement. The PCI is a rating from 0 to 100 (Very Poor to Excellent), where a higher number means a better road, and a lower number means a worse road. Each pavement is analyzed in a detailed manner for surface defects, surface deformation and cracking. Respective points are assigned for severity and extent of distress, after which the PCI is calculated for the pavement. The severity of a distress was classified as slight, moderate and severe, and the density was classified as Intermittent, Frequent and Extensive.

PAVEMENT DISTRESSES

The main surface distresses observed vary according to the surface types (Gravel, Surface Treated (LCB) and Paved (HCB)).

- **Loss of Coarse Aggregates** – Visible small pock marks appear on the pavement surface due to loss of coarse aggregates and propagate downwards for further loss of fine and coarse aggregate. The pavement surface will have the appearance of an open matrix with all coarse aggregates in spots.

- **Flushing** – The presence of free asphalt binder on the pavement surface due to separation of binder and aggregates in hot climates. This would be due to high asphalt content compared to air voids and high traffic volume which would worsen the condition.

- **Streaking** – The occurrence of alternate lean and thick lines parallel to the centerline of the road. Some even occur in the transverse direction; streaking usually results from a faulty spray bar height, angle and cold pavements.

- **Potholes** – Potholes are round or irregular shaped holes in pavement due to poor construction technique, poor quality material, and poor aggregates.

- **Pavement Edge Breaks** – The edge breaks occur with or without cracks due to frost action, excessive traffic loading at pavement edge, poor drainage at edge and shoulders, and insufficient bearing support.

- **Rippling** – Regular transverse undulations in the pavement surface consisting of closely spaced alternate valleys and crests; unevenness of pavement surface caused by traffic action moving surface mat forward, backward or sideways, eventually causing flushing. The major causes include unstable granular base, excessive asphalt, traffic action and poor workmanship.

- **Wheel Track Rutting** – Repeated load application due to compaction and permanent deformation under load and pavement material shoving sideways causing longitudinal depression on wheel tracks. Deep ruts are often

accompanied by longitudinal cracking in wheel tracks. The main causes are poorly compacted structural layer, unstable granular base, or sub-base, overstressed subgrade and positive pore water pressure.

- **Distortion** – Any deviation of pavement surface from its original shape is known as distortion. These distortions are the result of slope failure, settlement, and frost heaving and take the form of dishing, bumps, dips, tenting, or stepping; the moving vehicles have pitching, rolling and jarring effects.

- **Longitudinal Cracking** – These cracks are observed in the direction of travel and are usually situated at the center of wheel tracks, centerline, and mid-lane. Major causes are traffic loading combined with weak pavements, environmental and climatic conditions, and poor construction techniques.
- **Transverse Cracking** – Cracks occur perpendicular to the travel direction, and are usually regularly spaced if full width, and for half width, cracks occur at shorter intervals. The major cause is low temperature and frost action which causes the pavement surface to shrink.

- **Map Cracking** – These are cracks which are polygonal in shape that resemble a map. The cracks are a combination of transverse and longitudinal cracks.

- **Pavement Edge Cracking** – These cracks are usually parallel to the pavement edge and occur within 300 mm of pavement edge, which are either a continuous crack or crescent shaped cracks in a wave formation. These, if left untreated, may progress to the outer lanes of the pavement and farther. Major causes include frost action, poor drainage facility, inadequate pavement width and insufficient bearing support.

- **Alligator Cracking** – The name comes from the resemblance of the formation of a network of cracks with that of an alligator skin. These cracks are polygonal blocks, ranging from a few millimeters to 300 mm. This cracking is caused by softening of a part of structure due to repeated loading, thereby making it unable to hold the loads. Mostly, when longitudinal and transverse cracks are left unsealed, water percolates into the bottom layers of the pavement, causing softening and further alligatoring. These cracks are progressive under traffic and rain.

For Gravel roads, the major distresses analyzed are:

- **Loose Gravel** – Gravel surface loosely compacted results in gravel alongside wheel tracks, and windrows, along the shoulder, parallel to direction of traffic. The cause is due to insufficient or no compaction, and continuous traffic action.

- **Dust** – Creation of dust clouds due to traffic action which affects visibility and judgment of on-coming vehicles.

- **Potholes** – In gravel roads bowl-shaped depressions on road surface, due to frost action, excess moisture and inadequate structural strength, due to insufficient structural thickness. They are often round, oval or irregular in shape.

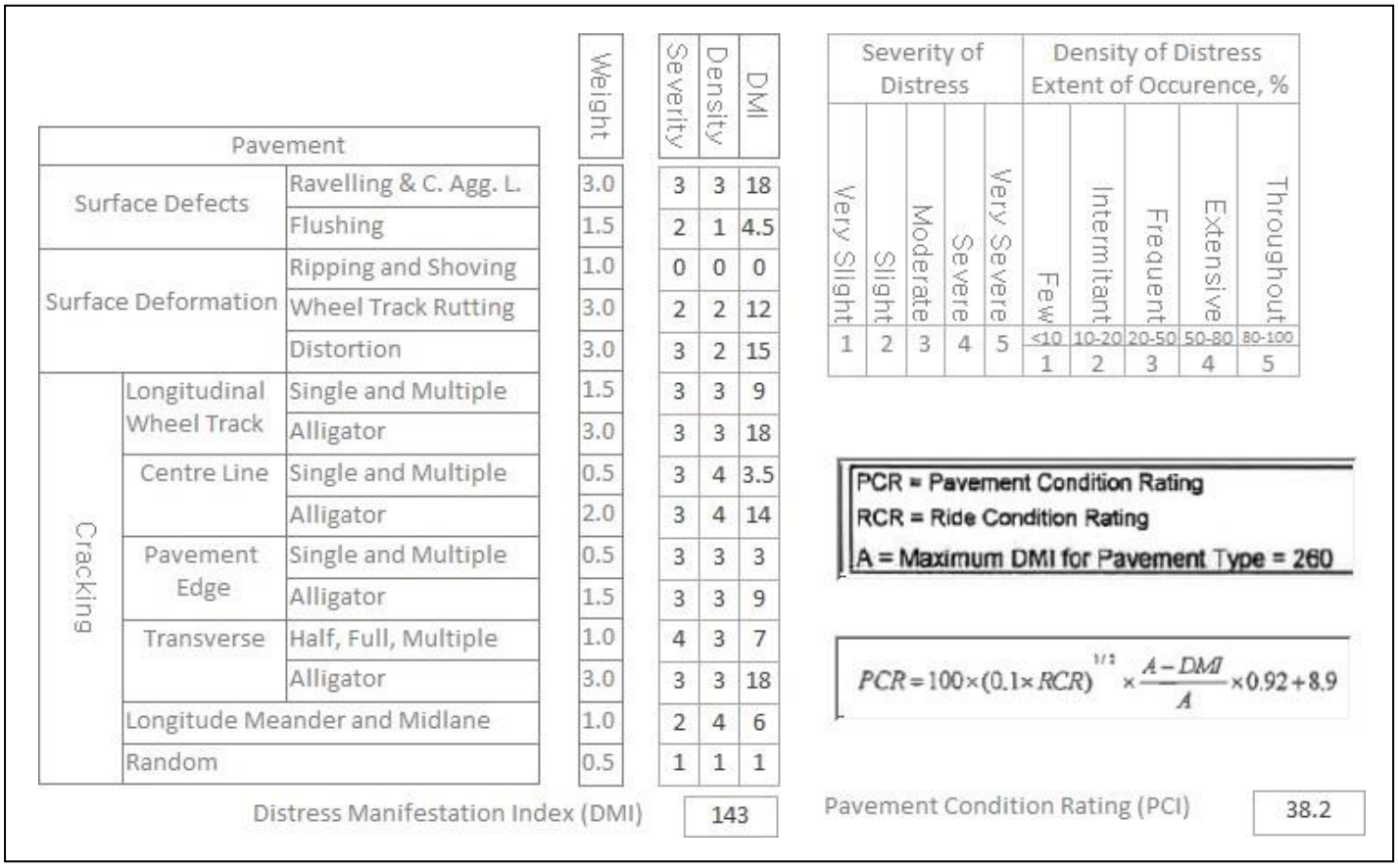
- **Breakup** – Subgrade soils punched up through the gravel surface, usually with the broken surface area surrounded by depression or dishing type of distortion, with distortion most likely at wheel tracks. These are caused due to frost action, inadequate structural strength and traffic action combined with excessive moisture.

- **Washboard** – A series of closely-spaced crests and valleys which resemble an old-fashioned washboard surface. Washboarding occurs with ripples perpendicular to the direction of travel, and more at the wheel tracks though it covers the whole of the pavement surface area. These are caused due to traffic action combined with loose gravel, insufficient structural strength and acceleration and deceleration at curves.

- **Rutting** – Generally occurs in the direction of traffic with surface depressions in the wheel path, and usually

resembles a longitudinal trough, caused by traffic loadings, inadequate structural strength and excessive moisture combined with traffic.

- **Flat or Reverse Crown** – Slope of the road is flat or non-existent, or reverse, with road edges higher than the center portion of road surface, caused by poor maintenance and poor construction practices.
- **Distortion** – Distortion is a deviation of the road surface from its original shape, and usually takes the shape of dishing, bumps, or dips which are noticeable, all of which give rise to pitch, roll, or jarring drop in a moving vehicle. These are caused by differential frost heave, a poorly drained road surface, reverse differential frost heave, lack of subgrade support, embankment slope failure and differential settlement of subgrade or base materials.



Pavement			Weight	Severity	Density	DMI
Surface Defects		Ravelling & C. Agg. L.	3.0	3	3	18
		Flushing	1.5	2	1	4.5
Surface Deformation		Ripping and Shoving	1.0	0	0	0
		Wheel Track Rutting	3.0	2	2	12
		Distortion	3.0	3	2	15
Cracking	Longitudinal Wheel Track	Single and Multiple	1.5	3	3	9
		Alligator	3.0	3	3	18
	Centre Line	Single and Multiple	0.5	3	4	3.5
		Alligator	2.0	3	4	14
	Pavement Edge	Single and Multiple	0.5	3	3	3
		Alligator	1.5	3	3	9
	Transverse	Half, Full, Multiple	1.0	4	3	7
		Alligator	3.0	3	3	18
	Longitude Meander and Midlane		1.0	2	4	6
	Random		0.5	1	1	1

Distress Manifestation Index (DMI) 143

Severity of Distress					Density of Distress Extent of Occurence, %				
Very Slight	Slight	Moderate	Severe	Very Severe	Few	Intermitant	Frequent	Extensive	Throughout
1	2	3	4	5	≤10	10-20	20-50	50-80	80-100
					1	2	3	4	5

PCR = Pavement Condition Rating
RCR = Ride Condition Rating
A = Maximum DMI for Pavement Type = 260

$$PCR = 100 \times (0.1 \times RCR)^{1/2} \times \frac{A - DMI}{A} \times 0.92 + 8.9$$

Pavement Condition Rating (PCI) 38.2

Figure 6: Pavement Damage and Severity and Density

- **Road Condition Rating – Enclosure E**

Road Surface Management

The purpose of road surface management is to delay road deterioration and extend the life of pavements by repairing minor road defects. Key road surface management operations include:

- **Patching** - Patching potholes and cracks in asphalt with hot mix or cold mix asphalt to repair minor damage.

- **Shoulder Grading** - The key operations are shouldering and grading which involve building up gravel shoulders with new material to meet the proper slope of the asphalt surface.

- **Grading Loose Top** - Applying new gravel to gravel roads with grading and compaction.

- **Dust Control** - Suppressing dust, where necessary, with the application of magnesium chloride.

- **Washout and Base Repair** - Applying new gravel to roads and shoulders that have been damaged by heavy rain.

- **Sweeping** - Maintaining paved intersections and roadways free of gravel on the pavement.

- **Crack Sealing -** Completed on roads that are at least three years old, crack sealing prolongs the lifespan of the asphalt by creating permanent seals. Roads requiring crack-sealing are prioritized on an ongoing basis.

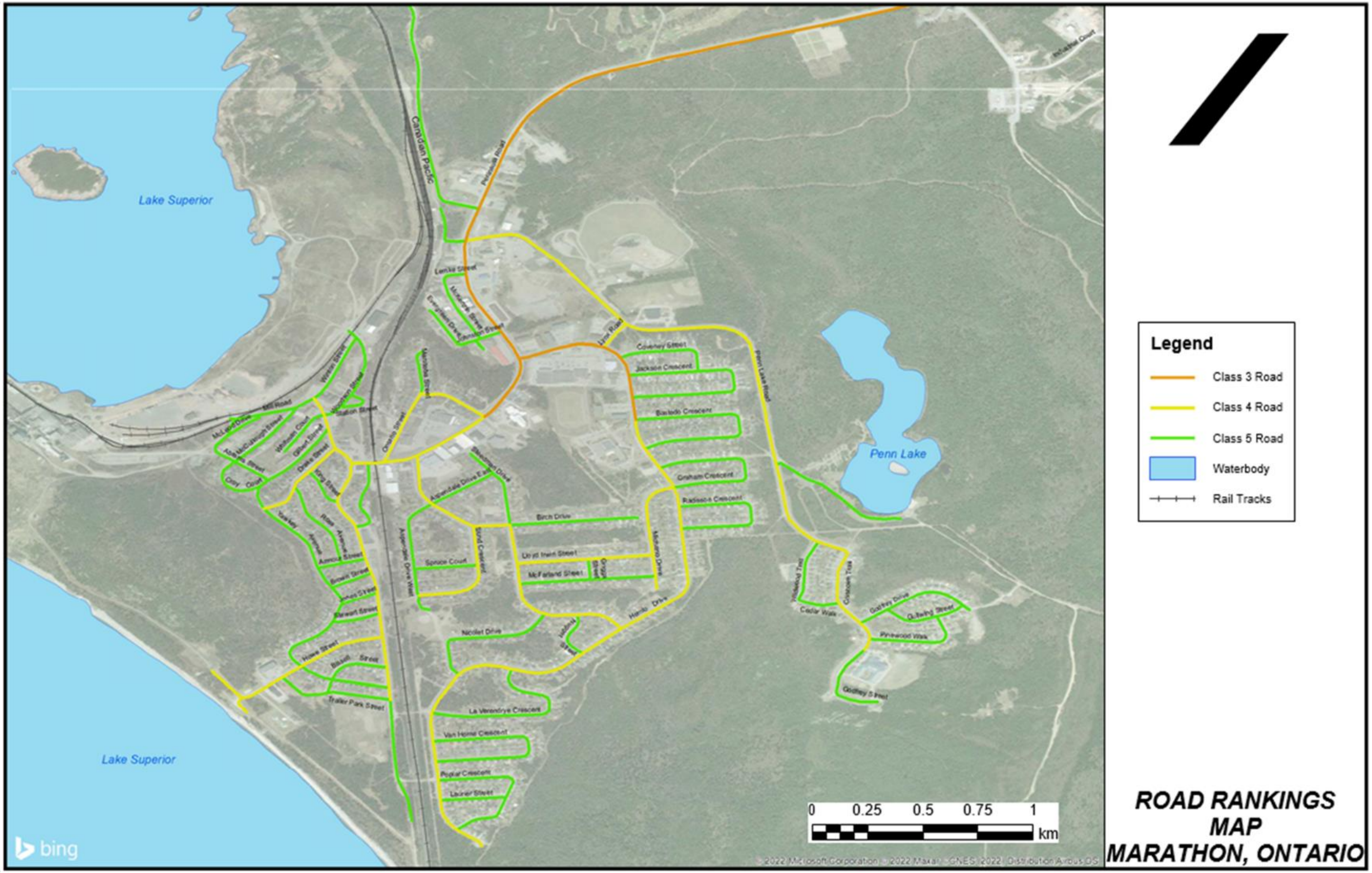
- **Culvert Upgrades and Repairs -** Culverts serve an important function in the management of water flow in Marathon. The Town routinely inspects and repairs damaged culverts.

- **Manhole & Catch basins -** Inspecting, cleaning, and repairing catch basins and manholes.

- **Shouldering and ditching -** Annual shouldering and ditching program takes place on roads that do not have curbs and gutters. roadside ditches for the prevention of roadway flooding and removing vegetation and debris to maximize drainage while maintaining erosion control.

Enclosure D

Town of Marathon – Road Rankings


Lake Superior
Lake Superior
Penn Lake
Canadian Pacific
Legend
Class 3 Road
Class 4 Road
Class 5 Road
Waterbody
Rail Tracks
0 0.25 0.5 0.75 1
km
bing
ROAD RANKINGS
MAP
MARATHON, ONTARIO

Enclosure E

Town of Marathon – Road Condition Rating

ID	Name of Road	Description	Pavement Type	Length (km)	Pavement Width (m)	Approx. Platform Width (m)	Traffic Capacity	Estimated Age (Years)	PCR	RCR	Si (#1)	Si (#2)	Si (#3)	Si (#4)	Si (#5)	Si (#6)	Si (#7)	Si (#8)	Si (#9)	Si (#10)
R-009-00	Lynx Ln	Penn Lake Rd E to Hemlo Dr	Flexible	0.12	6.8	9.2	Medium / High	15	35	4.0	4.0	0.0	0.0	0.0	4.0	0.0	4.0	3.0	0.0	0.0
R-028-00	Spruce Cr	Aspendale Dr W to Sund Cr	Flexible	0.18	6.5	8.5	Low	15	38	3.0	4.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0
R-045-01	Howe St	Start of Road W (Playground) to Yawkey Ave	Flexible	0.21	6.3	8.9	Medium	15	40	3.0	4.0	0.0	0.0	0.0	3.0	0.0	3.0	2.0	0.0	0.0
R-060-02	Stevens Ave	Trailer Park St to Peninsula Rd	Flexible	1.10	14.0	14.0	High	15	45	3.0	3.0	0.0	0.0	0.0	4.0	0.0	3.0	0.0	3.0	0.0
R-001-01	Penn Lake Rd E	Peninsula Rd to Lynx Ln	Flexible	0.70	6.6	10.4	High	15	48	4.5	4.0	0.0	0.0	0.0	3.0	2.0	3.0	2.0	0.0	0.0
R-059-02	Yawkey Ave	13 Yawkey St to Brown St	Flexible	0.28	6.9	6.9	Low	10 - 15	38	3.5	3.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	0.0	0.0
R-004-01	Chisholm Trail	Penn Lake Rd E to Pinewood W alk	Flexible	0.45	7.3	11.7	Medium	10	42	4.0	4.0	0.0	0.0	0.0	0.0	3.0	4.0	2.0	0.0	0.0
R-031-04	Hemlo Dr	Approx. 50m south of Laverendrye Cr S to End of Road S	Flexible	0.58	6.6	9.7	Medium	15	45	4.0	3.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	3.0	0.0
R-030-00	Michano Dr	Hemlo Dr to End of Road S	Flexible	0.50	6.5	8.8	Medium / Low	15	50	4.5	2.0	2.0	0.0	0.0	3.0	0.0	4.0	2.0	0.0	0.0
R-037-00	Manitoba St	Start of Road N to Ontario St	Flexible	0.17	6.2	8.6	Low	15	42	4.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
R-025-02	Steedman Dr	Birch St to End of Road N	Flexible	0.35	6.5	9.3	Low / Medium	15	45	3.5	3.0	3.0	2.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
R-019-00	Lloyd Irwin St	Steedman Dr to Michano Dr	Flexible	0.40	6.1	9.1	Low / Medium	15	47	4.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	2.0
R-055-00	W hitman Ct	Start of Road W to Stevens Ave	Flexible	0.24	6.5	6.5	Low	15	48	4.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	2.0
R-022-01	Birch St	Steedman Dr to Michano Dr	Flexible	0.40	6.3	8.3	Low / Medium	15	54	4.0	4.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	4.0	0.0
R-036-00	Ontario St	Pensinsula Rd to Peninsula Rd	Flexible	0.52	6.0	7.6	Medium / Low	15	58	3.5	3.0	0.0	0.0	0.0	2.0	3.0	0.0	0.0	0.0	0.0
R-011-00	Jackson Cr	Hemlo Dr to Hemlo Dr	Flexible	0.70	6.5	8.6	Low / Medium	15	72	6.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	2.0	0.0	3.0
R-039-00	Armour St	Yawkey Ave to Stevens Ave	Flexible	0.14	8.5	8.5	Low	15	48	4.0	4.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	0.0
R-020-00	McFarland St	Steedman Dr to Michano Dr	Flexible	0.40	6.4	8.5	Low	15	52	6.0	3.0	0.0	0.0	3.0	0.0	2.0	0.0	0.0	3.0	0.0
R-059-03	Yawkey Ave	Brown St to Stevens Ave	Flexible	0.72	8.5	8.5	Low	15	52	5.0	2.0	0.0	0.0	0.0	3.0	2.0	0.0	2.0	0.0	0.0
R-012-00	Bastedo Cr	Hemlo Dr to Hemlo Dr	Flexible	0.65	6.5	8.5	Low / Medium	10	62	5.5	3.0	0.0	0.0	0.0	2.0	1.0	0.0	0.0	0.0	2.0
R-022-02	Birch St	Steedman Dr to Sund Cr	Flexible	0.12	6.5	11.6	High	5	72	7.5	3.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	0.0	1.0
R-038-00	Alberta St	Ontario St to End of Road W	Gravel	0.10	-	7.5	Low	-	45											
R-048-00	Ross Ave	Drake St to Armour St	Flexible	0.37	9.5	9.5	Low	15	60	4.5	3.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	0.0
R-058-00	Station St	W oodson St to W oodson St	Flexible	0.12	9.8	9.8	Low	15	60	5.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
R-040-00	Brown St	Yawkey Ave to Stevens Ave	Flexible	0.12	8.6	8.6	Low	15	64	4.0	3.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
R-023-00	Nugget St	Steedman Cr to Hemlo Dr	Flexible	0.20	1.2	9.0	Low	15	64	7.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-005-00	Godfrey St	Chisholm Trail to End of Road E	Flexible	0.15	6.6	10.3	Low	15	65	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
R-013-00	Graham Cr	Hemlo Dr to Hemlo Dr	Flexible	0.55	6.6	8.5	Low	15	65	7.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	3.0
R-043-01	Bissell St	Yawkey Ave to Stevens Ave	Flexible	0.20	8.5	8.5	Low	15	67	5.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-027-00	Aspendale Dr W	Sund Cr to End of Road S	Flexible	0.50	6.2	8.8	Low	10-15	70	5.5	0.0	3.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-021-00	Griggs St	Lloyd Irwin St to McFarland St	Flexible	0.08	6.3	8.8	Low	15	65	7.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0
R-043-02	Bissell St	Yawkey Ave to Trailer Park St	Gravel	0.05	6.0	6.0	Low	-	70											
R-041-00	Jones St	Yawkey Ave to Stevens Ave	Flexible	0.11	8.2	8.2	Low	15	74	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-010-00	Coveney St	Hemlo Dr to Jackson Cr	Flexible	0.30	6.4	8.4	Low	12	75	7.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0
R-004-02	Chisholm Trail	Pinewood W alk to Godfrey St	Flexible	0.30	7.5	11.9	Low	10	78	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
R-031-01	Hemlo Dr	Peninsula Rd to Jackson Cr S	Flexible	0.50	7.8	11.4	High	10	78	8.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-045-02	Howe St	Yawkey Ave to Stevens Ave	Flexible	0.28	8.5	8.5	Medium	15	78	8.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
R-061-01	Peninsula Rd	Stevens Ave to Hemlo Dr	Flexible	0.75	7.5	7.5	High	15	79	8.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	1.0
R-006-00	Pinewood W alk	Chisholm Trail to Gullwing St	Flexible	0.35	6.2	8.7	Low	15	80	8.0	2.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	0.0
R-008-00	Godfrey Dr	Chisholm Trail to Gullwing St	Flexible	0.40	6.5	9.1	Low / Medium	15	81	7.5	2.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
R-035-00	Johnston St	Evergreen Dr to Peninsula Rd	Flexible	0.14	7.9	7.9	Medium / Low	15	82	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-051-00	McLeod Dr	Abrams St to W inton St	Flexible	0.29	7.0	9.5	Low	10-15	82	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0
R-017-00	Poplar Cr	Hemlo Dr to Hemlo Dr	Flexible	0.50	6.4	8.5	Low	15	82	8.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0
R-014-00	Radisson Cr	Hemlo Dr to Hemlo Dr	Flexible	0.50	6.6	9.2	Low / Medium	15	84	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-029-00	Sund Cr	Peninsula Rd to Aspendale Dr W	Flexible	0.80	7.1	9.6	High	10 - 15	84	8.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	1.0
R-025-01	Steedman Dr	Hemlo Dr to Birch St	Flexible	0.70	6.9	9.2	Medium / High	10- 15	85	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
R-016-00	Van Horne Cr	Hemlo Dr to Hemlo Dr	Flexible	0.60	6.5	8.4	Low / Medium	15	85	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0
R-044-00	Trailer Park St	Howe St to Stevens Ave	Gravel	0.36	6.8	6.8	Low	-	75											
R-060-01	Stevens Ave	Start of Road S to Trailer Park St	Gravel	0.39	8.0	8.0	Low	-	78											
R-060-03	Stevens Ave	Penisula Rd to W inton St	Flexible	0.35	13.0	13.0	High	10 - 15	79	9.0	1.0	1.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
R-015-00	La Verendrye Cr	Hemlo Dr to Hemlo Dr	Flexible	0.60	6.3	8.2	Low	15	81	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
R-018-00	Laurier St	Hemlo Dr to Poplar Cr	Flexible	0.20	6.5	8.3	Low	15	82	8.5	2.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
R-061-02	Peninsula Rd	Hemlo Dr to Penn Lake Rd E	Flexible	0.55	7.0	7.0	High	15	83	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
R-002-00	W ildwood Trail	Penn Lake Rd E to Cedar W alk	Flexible	0.30	7.0	10.6	Low	15	83	8.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0
R-007-00	Gullwing St	Godfrey Dr to Godfrey Dr	Flexible	0.25	6.5	19.0	Low	15	84	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-003-00	Cedar W alk	W ildwood Trail to Chisholm Trail	Flexible	0.15	6.4	8.6	Low	10	85	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-033-00	McKenzie St	Lemcke St to Johnston St	Flexible	0.30	6.5	6.5	Low	15	85	9.0	3.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	2.0
R-034-00	Evergreen Dr	Start of Road N to Johnston St	Flexible	0.18	7.8	7.8	Low	15	86	8.0	3.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
R-050-00	Abrams St	Croy Ct to McLeod Dr	Flexible	0.23	9.0	9.0	Low / Medium	10-15	88	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-032-00	Lemcke St	Peninsula Rd to McKenzie St	Flexible	0.06	8.7	8.7	Low	15	88	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0
R-053-00	Gilbert St	Abrams St to Stevens Ave	Flexible	0.28	9.0	9.0	Low	5	89	9.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-061-03	Peninsula Rd	Penn Lake Rd E to Cemetery	Flexible	1.50	10.0	11.0	High	10 - 15	89	8.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
R-059-01	Yawkey Ave	Croy Ct to 13 Yawkey St	Flexible	0.24	9.0	9.0	Low	15	89	9.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0
R-031-03	Hemlo Dr	Steedman Dr to approx. 50 m south of Laverendrye Cr S	Flexible	0.80	6.6	9.0	High	10	89	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0
R-024-00	Nicolet Dr	Steedman Cr to Hemlo Dr	Flexible	0.50	6.5	9.5	Low	1	89	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
R-061-04	Peninsula Rd	Cemetery to Highway 17	Flexible	2.30	10.0	11.0	High	10 - 15	89	9.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
R-052-00	McCullough St	Abrams St to W inton St	Flexible	0.30	9.9	9.9	Low	10-15	90	8.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-049-00	Croy Ct	Abrams St to Abrams St	Flexible	0.27	9.0	9.0	Low	2	92	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-056-00	W inton St	McCullough St to W oodson St	Flexible	0.38	8.3	8.3	Low	5	93	9.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-057-00	W oodson St	Stevens Ave to Mill Entrance N	Flexible	0.42	8.7	8.7	Low	5	93	9.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-046-00	Drake St	Yawkey Ave to Stevens Ave	Flexible	0.35	9.0	9.0	Low / Medium	2	94	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
R-031-02	Hemlo Dr	Jackson Cr S to Steedman Dr	Flexible	1.15	7.5	9.6	High	10	94	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-047-00	King St	Drake St to Stevens Ave	Flexible	0.14	8.9	8.9	Low	10	95	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
R-054-00	Mill Rd	W inton St to Mill Entrance	Flexible	0.16	7.4	7.4	Medium	10 - 15	95	9.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
R-001-02	Penn Lake Rd E	Lynx Ln to Chisholm Trail	Flexible	1.50	7.2	10.8	Low	5	95	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-042-00	Stewart St	Yawkey Ave to Stevens Ave	Flexible	0.14	7.8	7.8	Low	10 - 15	95	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-026-00	Aspendale Dr E	Steedman Dr to Sund Cr	Flexible	0.22	6.0	7.0	Low	1	98	9.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ID	Si (#11)	Si (#12)	Si (#13)	Si (#14)	Si (#15)	Di (#1)	Di (#2)	Di (#3)	Di (#4)	Di (#5)	Di (#6)	Di (#7)	Di (#8)	Di (#9)	Di (#10)	Di (#11)	Di (#12)	Di (#13)	Di (#14)	Di (#15)	DMI	PCI	Priority Rating	Timing Ordering	Estimated Major Item Cost (Removals, IPP, Asphalt, Granulars, Ditching, Mob/Demob, Traffic Control, Contingency)	Estimated Present Day Rehabilitation Cost (Total Cost - Major & Minor Items i.e., culverts, sidewalks, topsoil, etc.)
R-009-00	4.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	3.0	2.0	0.0	0.0	4.0	2.0	0.0	0.0	0.0	79.5	49.43	Now - Full Rehabilitation	1	$ 117,333.25	$ 191,621.00
R-028-00	3.0	0.0	4.0	0.0	3.0	4.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	4.0	0.0	3.0	0.0	2.0	0.0	2.0	90.5	41.85	Now - Full Rehabilitation	1	$ 130,471.70	$ 213,077.86
R-045-01	3.0	0.0	3.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	2.0	0.0	2.0	79.5	43.99	Now - Full Rehabilitation	1	$ 142,829.20	$ 233,259.32
R-060-02	3.0	3.0	0.0	0.0	3.0	2.0	0.0	0.0	0.0	2.0	0.0	4.0	0.0	3.0	0.0	3.0	2.0	0.0	0.0	3.0	83.0	43.31	Now - Full Rehabilitation	1	$ 1,588,339.60	$ 2,593,972.55
R-001-01	0.0	3.0	0.0	2.0	0.0	3.0	0.0	0.0	0.0	2.0	4.0	3.0	2.0	0.0	0.0	0.0	5.0	0.0	3.0	0.0	78.0	52.24	Now - Full Rehabilitation	1	$ 442,326.76	$ 722,379.19
R-059-02	0.0	4.0	0.0	3.0	2.0	2.0	0.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	0.0	0.0	2.0	0.0	3.0	4.0	42.5	54.59	2 years - Restore drainage & Surface	2	$ 249,382.18	$ 407,274.70
R-004-01	3.0	3.0	0.0	2.0	2.0	3.0	0.0	0.0	0.0	0.0	3.0	2.0	2.0	0.0	0.0	3.0	4.0	0.0	3.0	3.0	73.5	50.77	2 years - Restore drainage & Surface	2	$ 316,766.93	$ 517,323.07
R-031-04	4.0	4.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	3.0	3.0	0.0	2.0	2.0	57.5	54.37	2 years - Restore drainage & Surface	2	$ 372,849.11	$ 608,912.83
R-030-00	4.0	3.0	0.0	2.0	2.0	2.0	2.0	0.0	0.0	2.0	0.0	3.0	3.0	0.0	0.0	2.0	2.0	0.0	2.0	1.0	76.0	52.72	2 years - Restore drainage & Surface	2	$ 324,053.30	$ 529,222.70
R-037-00	4.0	0.0	4.0	2.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	3.0	0.0	1.0	2.0	0.0	70.5	51.45	3 years - Restore drainage & Surface	3	$ 124,255.52	$ 202,926.01
R-025-02	4.0	4.0	0.0	0.0	3.0	2.0	1.0	2.0	0.0	2.0	0.0	0.0	3.0	0.0	0.0	2.0	3.0	0.0	0.0	3.0	62.0	50.49	3 years - Restore drainage & Surface	3	$ 208,004.91	$ 339,700.04
R-019-00	0.0	4.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	2.0	0.0	2.0	0.0	0.0	3.0	58.0	54.26	3 years - Restore drainage & Surface	3	$ 224,371.28	$ 366,428.53
R-055-00	0.0	4.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0	52.5	55.49	3 years - Restore drainage & Surface	3	$ 121,206.90	$ 197,947.20
R-022-01	2.0	0.0	4.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	3.0	0.0	4.0	82.0	48.86	3 years - Restore drainage & Surface	3	$ 225,504.24	$ 368,278.80
R-036-00	3.0	3.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	54.5	52.06	3 years - Restore drainage & Surface	3	$ 227,279.90	$ 371,178.70
R-011-00	0.0	4.0	0.0	2.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	0.0	3.0	0.0	2.0	0.0	2.0	0.0	45.0	68.04	3 years - Restore drainage & Surface	3	$ 432,908.54	$ 706,997.97
R-039-00	0.0	4.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	3.0	1.0	46.0	56.96	4 years - Restore drainage & Surface	4	$ 186,792.02	$ 305,056.53
R-020-00	0.0	4.0	0.0	2.0	0.0	2.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0	4.0	0.0	0.0	2.0	0.0	3.0	0.0	58.0	64.46	4 years - Restore drainage & Surface	4	$ 227,384.00	$ 371,348.71
R-059-03	0.0	3.0	0.0	2.0	2.0	3.0	0.0	0.0	0.0	2.0	3.0	0.0	4.0	0.0	0.0	0.0	3.0	0.0	2.0	3.0	53.0	60.87	4 years - Restore drainage & Surface	4	$ 546,358.96	$ 892,277.79
R-012-00	3.0	3.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	3.0	1.0	2.0	0.0	2.0	0.0	46.0	65.26	4 years - Restore drainage & Surface	4	$ 405,202.25	$ 661,749.86
R-022-02	0.0	0.0	0.0	2.0	3.0	2.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	4.0	59.0	70.72	4 years - Restore drainage & Surface	4	$ 116,954.74	$ 191,002.85
R-038-00																					0.0	-	5 years - Restore drainage & Surface	5	$ 85,215.60	$ 139,168.56
R-048-00	0.0	3.0	0.0	3.0	0.0	1.0	0.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	40.5	61.18	5 years - Restore drainage & Surface	5	$ 349,367.05	$ 570,563.46
R-058-00	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	22.0	68.66	5 years - Restore drainage & Surface	5	$ 182,820.59	$ 298,570.66
R-040-00	0.0	4.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	3.0	2.0	36.5	59.09	5 years - Restore drainage & Surface	5	$ 175,041.42	$ 285,866.23
R-023-00	3.0	4.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	1.0	0.0	0.0	2.0	33.5	78.57	5 years - Restore drainage & Surface	5	$ 121,627.20	$ 198,633.60
R-005-00	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	3.0	0.0	4.0	0.0	0.0	33.5	71.21	5 years - Restore drainage & Surface	5	$ 133,987.94	$ 218,820.36
R-013-00	3.0	3.0	0.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	2.0	1.0	2.0	0.0	0.0	2.0	39.5	74.42	5 years - Restore drainage & Surface	5	$ 352,538.50	$ 575,742.86
R-043-01	0.0	3.0	0.0	3.0	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	0.0	2.0	1.0	31.0	66.40	5 years - Restore drainage & Surface	5	$ 223,988.60	$ 365,803.56
R-027-00	3.0	0.0	3.0	2.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	3.0	1.0	1.0	38.5	67.23	5 years - Restore drainage & Surface	5	$ 268,945.80	$ 439,224.72
R-021-00	0.0	4.0	0.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	2.0	0.0	1.0	0.0	2.0	3.0	24.5	81.34	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 85,319.73	$ 139,338.61
R-043-02																						-	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 51,687.80	$ 84,413.14
R-041-00	0.0	4.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	10.0	77.68	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 166,411.00	$ 271,771.59
R-010-00	0.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.0	0.0	3.0	0.0	1.0	0.0	34.5	78.26	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 212,693.84	$ 347,357.69
R-004-02	0.0	3.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	11.5	87.85	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 230,335.94	$ 376,169.62
R-031-01	0.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	2.0	0.0	1.0	2.0	25.5	83.40	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 474,524.40	$ 774,962.27
R-045-02	0.0	3.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	3.0	0.0	0.0	2.0	19.5	87.66	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 273,584.04	$ 446,799.59
R-061-01	0.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0	1.0	0.0	3.0	0.0	1.0	0.0	2.0	0.0	0.0	1.0	31.5	81.49	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 697,409.50	$ 1,138,963.67
R-006-00	0.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	21.5	84.67	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 237,860.54	$ 388,458.31
R-008-00	0.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	23.0	81.80	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 269,899.28	$ 440,781.88
R-035-00	0.0	3.0	0.0	3.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	2.0	0.0	1.0	2.0	23.0	84.19	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 133,111.25	$ 217,388.61
R-051-00	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	8.5	91.26	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 186,462.98	$ 304,519.17
R-017-00	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	1.0	0.0	3.0	0.0	2.0	0.0	2.0	0.0	0.0	1.0	26.5	83.08	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 321,430.00	$ 524,938.49
R-014-00	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	20.5	84.98	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 326,950.20	$ 533,953.72
R-029-00	0.0	2.0	0.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	0.0	2.0	0.0	2.0	0.0	1.0	2.0	18.0	85.78	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 425,393.76	$ 694,725.32
R-025-01	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	6.5	91.91	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 394,457.38	$ 644,202.04
R-016-00	0.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	1.0	0.0	2.0	0.0	0.0	0.0	18.0	85.78	6 - 10 years - normal maintenance (Spot Repairs as required)	6	$ 377,550.68	$ 616,591.12
R-044-00																						-	10 years + - Normal maintenance	7	$ 219,348.88	$ 358,226.27
R-060-01																						-	10 years + - Normal maintenance	7	$ 295,651.42	$ 482,838.60
R-060-03	0.0	2.0	0.0	2.0	2.0	2.0	1.0	0.0	0.0	0.0	2.0	0.0	4.0	0.0	0.0	0.0	2.0	0.0	3.0	1.0	31.5	85.89	10 years + - Crack Sealing Year 3 - 5	7	$ 541,977.20	$ 885,121.78
R-015-00	0.0	3.0	0.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	1.0	0.0	2.0	0.0	0.0	1.0	20.0	85.14	10 years + - Crack Sealing Year 3 - 5	7	$ 372,568.04	$ 608,453.80
R-018-00	0.0	2.0	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	2.0	0.0	2.0	0.0	1.0	0.0	23.0	86.51	10 years + - Crack Sealing Year 3 - 5	7	$ 159,074.12	$ 259,789.47
R-061-02	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	13.0	87.37	10 years + - Crack Sealing Year 3 - 5	7	$ 514,788.00	$ 840,718.16
R-002-00	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	18.0	85.78	10 years + - Crack Sealing Year 3 - 5	7	$ 222,794.36	$ 363,853.20
R-007-00	0.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	15.5	86.57	10 years + - Crack Sealing Year 3 - 5	7	$ 200,980.25	$ 328,227.82
R-003-00	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	6.5	86.88	10 years + - Crack Sealing Year 3 - 5	7	$ 131,511.08	$ 214,775.31
R-033-00	0.0	3.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	0.0	0.0	34.5	84.88	10 years + - Crack Sealing Year 3 - 5	7	$ 180,836.30	$ 295,330.04
R-034-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	2.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	24.5	83.71	10 years + - Crack Sealing Year 3 - 5	7	$ 138,217.93	$ 225,728.50
R-050-00	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	14.0	91.79	10 years + - Crack Sealing Year 3 - 5	7	$ 248,799.42	$ 406,322.97
R-032-00	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.0	0.0	0.0	2.0	0.0	0.0	19.5	89.94	10 years + - Crack Sealing Year 3 - 5	7	$ 81,648.16	$ 133,342.45
R-053-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	15.5	93.55	10 years + - Crack Sealing Year 3 - 5	7	$ 281,147.12	$ 459,151.12
R-061-03	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	16.5	88.64	10 years + - Crack Sealing Year 3 - 5	7	$ 1,540,730.00	$ 2,516,219.66
R-059-01	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	17.5	90.61	10 years + - Crack Sealing Year 3 - 5	7	$ 255,268.96	$ 416,888.60
R-031-03	0.0	2.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	0.0	0.0	1.0	14.0	94.07	10 years + - Normal maintenance	7	$ 492,244.80	$ 803,902.07
R-024-00	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	4.5	95.00	10 years + - Normal maintenance	7	$ 325,968.50	$ 532,350.47
R-061-04	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	16.5	90.95	10 years + - Normal maintenance	7	$ 2,335,786.00	$ 3,814,653.21
R-052-00	0.0	2.0	0.0	2.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	28.5	82.44	10 years + - Crack Sealing Year 3 - 5	7	$ 308,672.14	$ 504,103.19
R-049-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	10.5	95.28	10 years + - Normal maintenance	7	$ 274,677.58	$ 448,585.49
R-056-00	0.0	0.0	0.0	0.0	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	15.0	91.46	10 years + - Normal maintenance	7	$ 332,512.35	$ 543,037.46
R-057-00	0.0	2.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	21.5	91.47	10 years + - Normal maintenance	7	$ 364,913.91	$ 595,953.57
R-046-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	10.0	95.45	10 years + - Normal maintenance	7	$ 326,433.90	$ 533,110.54
R-031-02	0.0	2.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	11.5	94.93	10 years + - Normal maintenance	7	$ 992,033.08	$ 1,620,123.67
R-047-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	10.5	95.28	10 years + - Normal maintenance	7	$ 189,817.25	$ 309,997.14
R-054-00	0.0	2.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	11.5	94.93	10 years + - Normal maintenance	7	$ 189,683.01	$ 309,777.91
R-001-02	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	3.0	97.88	10 years + - Normal maintenance	7	$ 926,428.40	$ 1,512,982.39
R-042-00	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	4.0	97.53	10 years + - Normal maintenance	7	$ 181,497.86	$ 296,410.46
R-026-00	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	98.67	10 years + - Normal maintenance	7	$ 142,583.04	$ 232,857.31