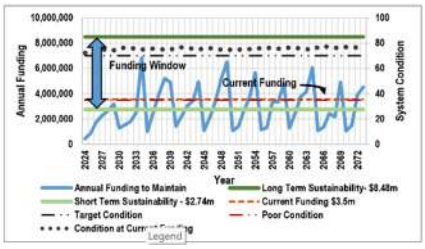
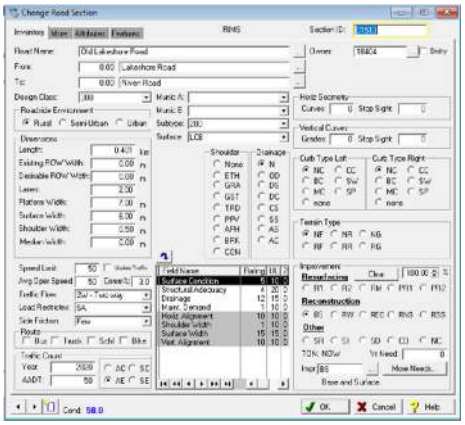
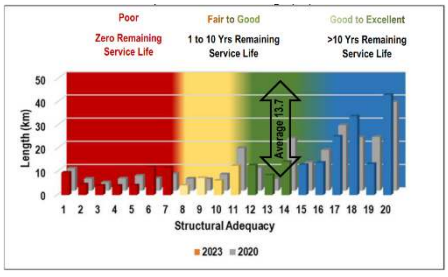
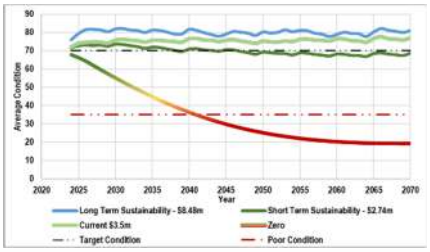
Niagara-on-the-Lake
EST.1781

Town of Niagara-on-the-Lake
2023 State of the Infrastructure and Asset Management Plan for Roads









4 ROADS MANAGEMENT SERVICES

Kitchener, Ontario
www.4roads.ca

4 ROADS MANAGEMENT SERVICES

December 22, 2023

Niagara-on-the-Lake
1593 Four Mile Creek Road, PO Box 100,
Virgil, ON, L0S 1T0

Attention: **Mike Komljenovic, Engineering Supervisor**

2023 State of the Infrastructure and Asset Management Plan for Roads,

Dear Mr. Komljenovic;

4 Roads Management Services Inc. (4 Roads) is pleased to provide this report to the municipality of Niagara-on-the-Lake. The 2023 project updated the condition data on the roads, and updated costing and analysis on the entire road system.

The 2023 field review included the entire Niagara-on-the-Lake road system. Updated estimates for recommended improvements and replacement costs have been developed based on current unit pricing provided by Niagara-on-the-Lake (NotL). Calculations for Time of Need, Improvement and Replacement Costs and Performance modeling were developed generally in accordance with the Ministry of Transportation's Inventory Manual for Municipal Roads, 1991.

Regulation 588/17, Asset Management Planning for Municipal Infrastructure, requires that all lifecycle activities are to be considered in the development of a 10 year plan that will maintain or improve the average condition of the asset group. The methodology used to develop the work plan is in conformity with the requirements of Regulation 588/17.

We trust that the information provided in this report will be beneficial to the Niagara-on-the-Lake in the continuing evolution of their Asset Management Plans. Please do not hesitate to call or email if you require any further information or discussion on any aspect of the report. Thank you for the opportunity to prepare this report. If 4 Roads Management Services Inc. may be of any further service, please do not hesitate to contact the undersigned.

Yours truly,

David Anderson

David Anderson, CET

Digitally signed by David Anderson, CET
DN: cn=David Anderson, CET gn=David Anderson, CET c=CA Canada l=CA Canada o=4 Roads Managemenet Services Inc. e=dave.anderson@4roads.ca
Reason: I am the author of this document
Location:
Date: 2023-12-22 14:11-05:00

David Anderson, CET, President,
4 Roads Management Services Inc.
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Niagara-on-the-Lake
2023 State of the Infrastructure and Asset Management Plan for Roads

4 ROADS MANAGEMENT SERVICES

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Executive Summary

Project Scope

The scope of this report is to prepare a State of the Infrastructure (SOTI) report that includes:

- Field review and condition rating on all of the road assets within the Niagara-on-the-Lake road system.
- Updated dimensional information, where improvements have occurred.
- Add or change road sections to better reflect the constitution of the road system, as required.
- Develop updated replacement and improvement costs for each road asset, based on current unit costs and standard formulae from the Inventory Manual for Municipal Roads, 1991.
- Develop/review recommendations for improvement and associated costing on deficient assets.
- Develop recommendations for annual budgets based on current costs for Long Term Sustainability and major program areas based on updated unit costs.
- Develop analysis on the effect of current and recommended budgets on overall system performance.
- Develop a 10 year work plan.
- Provide Asset Management Strategy recommendations.
- Provide the answers to the basic asset management questions;
    - What you have?
    - Where it's located?
    - What condition is it in?
    - What is it worth?
    - What will it cost to replace it?
    - Useful remaining life?
    - What service level will be required over the service life?
- A report on the foregoing.
- An updated geodatabase

The 2023 State of the Infrastructure Report summarizes the road system survey conducted during the spring and summer of 2023. Gravel Roads were *not* reviewed during the spring breakup. The field review of the system was undertaken in mid to late June 2023. The report includes condition updates on projects that will be completed subsequent to the field work, including rehabilitations, resurfacing, and reconstruction and capital works in progress. The survey identifies the condition of each road asset by its time of need and recommended maintenance, rehabilitation or reconstruction treatment.

The report provides an overview of the physical and financial needs of the road system in its entirety as well as by road section. Both information sources are used to develop programming and budgets. However, once a road section reaches the project design stage, further detailed review, investigation, and design will be required to address the specific requirements of the specific project.

This report should not be confused with a road safety audit. A road safety audit is the formal safety performance examination of an existing or future road or intersection, which qualitatively estimates and reports on potential road safety issues, and identifies opportunities for improvements for all road users. Typically, and more predominantly in a lower tier, rural municipality on lower volume road sections, the road system has some deficiencies with the existing horizontal and vertical alignment.

Niagara-on-the-Lake staff provided information with respect to their database/network, and updated unit costs from current tenders.

Asset Management Planning – Historical and Current Context

Road Needs Studies (RNS) were implemented by the Ministry of Transportation Ontario (MTO) in the 1960's, and evolved into the current methodology by the late 1970's. The most current version of the Inventory Manual for Municipal Roads is dated 1991, and is the methodology used for this report.

The process was originally created by the MTO as a means to equitably distribute conditional grant funding between municipalities. The practice was discontinued by a number of municipalities, when conditional funding for roads was eliminated in the mid 1990's. The RNS process is a sound, consistent asset management practice that still works well today, and in view of the increasing demands on efficiency and asset management, represents a sound business practice that is beneficial to continue.

To put the Road Needs Study in a more current context, the State of the Infrastructure (SotI) is essentially a Road Needs Study. This project enhances the basic requirements of a condition report by providing detailed analysis of the data and development of a work plan based on the data, the current budget, incorporating modern asset management principles.

In August 2012, the Province of Ontario, introduced a requirement for an Asset Management Plan (AMP) as a prerequisite for municipalities seeking funding assistance for capital projects from the province; effectively creating a conditional grant. To qualify for future infrastructure grants, an AMP had to be developed and approved by a municipal council by December 2013. On April 26, 2013 the province announced that it had created a $100 million Infrastructure Fund for small, rural and northern municipalities.

Subsequently, the province has introduced further initiatives for infrastructure funding: Ontario Community Infrastructure Fund (OCIF) and the Small Communities Fund (SCF). An Asset Management Plan (AMP) approved by Council is required as part of the submission for OCIF Applications. Asset Management Plans were to be reviewed for comprehensiveness.

On December 27, 2017, the Province filed Regulation 588/17, Asset Management Planning for Municipal Infrastructure. The regulation identifies provincial requirements and timelines for development and implementation of asset management plans. Initially, AMP's will have to include the 'core' assets; water and waste water linear and treatment, roads, bridge and culvert structures, and storm water linear and treatment.

Regulation 588/17 required an Asset Management Plan (AMP) for core assets by July 1, 2021 (revised to July 1, 2022) that is based on condition data that is no more than two years old. The frequency of road inspections in NotL has not met this standard in the past. However, this project positions NotL well for compliance with the Regulation from a road asset perspective, including preparations for the 2025 AMP for all municipally owned assets.

Key elements of O.Reg 588/17 include

- The AMP has to sustain the condition of the assets. (This is typically a function of adequate budget and appropriate programming)
- The AMP has to be approved by the Executive Lead
- The AMP has to be approved by Council
- The status of the AMP has to be reported on annually

The assumption is that a valid AMP will be a potential requirement for some provincial grants in the future. Conditional Grants are not new to Ontario. Until the mid-1990's, Road Needs Studies (RNS) were completed by municipalities and submitted to the Ministry of Transportation (MTO) on an annual basis in order to receive provincial funding for their road programs.

Niagara-on-the-Lake (NotL or the Town) is currently evolving the AMP for the various asset groups, roads being one of them. A key component of the AMP is a *'State of the Infrastructure'* (SotI) review of the asset or asset group. This report provides the SotI review of the Niagara-on-the-Lake road system and also provides recommendations for budgets and road asset programming; effectively an Asset Management Plan for Roads.

Niagara-on-the-Lake staff provided updated information with respect to their database/network

Report Methodology Overview

Regulation 588/17 Asset Management Planning for Municipal Infrastructure requires;

> '*v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.'*

Data collection and road ratings were completed generally in accordance with the Ministry of Transportation Ontario (MTO) *Inventory Manual for Municipal Roads, 1991*. (*Inventory Manual or IM*). The ratings are either a standalone value or incorporated into calculations performed by the software. The ratings or calculations then classify the road section as a 'NOW', '1 to 5', or '6 to 10' year need for maintenance, rehabilitation or reconstruction in six critical areas.

The *Inventory Manual* offers a holistic review of each road section, developing a Time of Need (TON) or an Adequate rating in six areas that are critical to municipal decision making:

- Geometrics
- Surface Type
- Surface Width
- Capacity
- Structural Adequacy
- Drainage

It would be critically flawed to develop an improvement recommendation based on condition alone.

The Time of Need is a prediction of the time until the road requires reconstruction, ***not the time frame until action is required***. Generally, the closer the timeline to reconstruction, the greater the deterioration of the road is. For example, a road may be categorized as a '6 to 10' year need with a resurfacing recommendation. This road should be resurfaced as soon as possible to further defer the need to reconstruct.

Reporting and analysis is on an individual road asset (or road section) basis. Road sections should be reasonably consistent throughout their length, according to roadside environment, surface type, condition, cross section, speed limit, traffic count or a combination of these factors. For example, new sections should be created as surface type, surface condition, cross-section, or speed limit changes as appropriate or practical.

Accurate and current traffic counts are critical in managing a road system and their importance cannot be emphasized enough, particularly truck traffic. Traffic counts establish road maintenance classifications for Minimum Maintenance Standards purposes, as per Ontario Regulation 239/02 (*Minimum Maintenance Standards for Municipal Roads, revised May 3, 2018*), functional classifications as per Regulation 588/17 classification (*Asset Management Planning for Municipal Infrastructure*), as well as determining appropriate geometry, structure, and cross-section when the road is rehabilitated or reconstructed. Traffic counts, including truck counts, should continue to be updated on a regular cycle, as a risk management exercise. The changes in traffic patterns resultant from the pandemic may skew the traffic counts downward, causing an inaccurate determination of the O.Reg 239/02 classification, which would pose a potential liability for NotL.

Road conditions are evaluated during a field inspection. The ratings are either as a standalone value or incorporated into calculations performed by the software in accordance with the *Inventory Manual*, that then classify the road section as a 'Now', '1 to 5', or '6 to 10' year need for maintenance, rehabilitation or reconstruction into the six critical areas noted above.

Recommendations are made based on the defects observed and other information available in the database at the time of preparation of the report. Once a road asset reaches the project level, the municipality may have selected another alternative based on additional information, asset management strategy, development considerations or available funding.

'NOW' needs represent road sections that require reconstruction or major rehabilitation. 'NOW' needs are the backlog of work required on the road system; however, 'NOW' needs may not necessarily be the priority, from an asset management perspective. Preservation and resurfacing treatments typically offer a better Return on Investment (ROI) than major rehabilitation or reconstruction. Construction improvements identified within this time period are representative of roads that have little or no service life left and are in poor condition, or have a significant drainage or capacity need. Resurfacing treatments are never a 'NOW' need, with the following exceptions;

- RW (Resurface and Widen) as this is driven by the road asset's capacity.
- PR1 or PR2 (Pulverize and resurface 1 or 2 lifts of asphalt).
- When the surface type is inadequate for the traffic volume (i.e., gravel road over 400AADT).
- When the surface is gravel and the roadside environment is Urban or Semi-Urban.

'1 to 5' identifies road sections where reconstruction is anticipated within the next five years, based upon a review of their current condition. These roads can be good candidates for resurfacing treatments that would extend the life of the road (depending on any other deficiencies), deferring the need to reconstruct. These roads would be considered to be in fair condition.

'6 to 10' identifies road sections where reconstruction improvements are anticipated within six to ten years, based upon a review of their current condition. These roads can be good candidates for resurfacing treatments that would extend the life of the road (depending on any other deficiencies), thus deferring the need to reconstruct. These roads would be considered to be in good condition.

'ADEQ' identifies road sections that do not have reconstruction or resurfacing needs, although minor maintenance such as crack sealing, other preservation treatments or spot drainage may be required. These roads would be considered to be in good to excellent condition.

This report summarizes the identified needs through a number of tabular appendices.

When the *Inventory Manual* was originally developed, the Province provided funding for municipal road systems; the road systems were measured by their system adequacy. The system adequacy is the percentage of the road system that is not a "NOW" need. This would be a Level of Service (LOS) measure.

The *Inventory Manual* provides direction that roads with a traffic volume of less than 50 vehicles per day *are deemed to be adequate*, even if they have structural, geometric, or drainage deficiencies that would otherwise be identified as being in a Time of Need. This factor does have an effect on the System Adequacy measure.

Originally, the intention was that the low volume roads were to be corrected within the maintenance allocation (as opposed to the capital allocation). Conditional grant funding no longer exists as it did until the mid 1990's.

To gain a more accurate reflection of the condition of the road network, the roads with an AADT of less than 50 have been analyzed and report as follows;

- 10.78% (28.176 km) of the roads system has an actual or estimated count of less than 50 vehicles per day. This measure includes the earth roads.
- 8.29% (21.655 km) would be "NOW' Needs if the '50' rule was not applied. .
- If the roads with an AADT of less than 50 were considered in the System Adequacy measure, then the system adequacy would be reduced by a further 8.29%. However, even with that reduction, the measure for System Adequacy would be above the recommended level.

Asset Management Plan Development Requirements

Regulation 588/17 required an asset management plan for core assets by July 1, 2021, then revised to July 1, 2022.

Core assets for NotL would include roads, structures greater than 3m span, and storm water linear and treatment assets, sanitary linear and water linear assets.

O.Reg 588/17 requires an Asset Management Plan for all asset by July 1, 2025.

O. Reg 588/17 provides significant guidance in the development of the asset management plan and states in part;

> *"4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:*
>
> *I. The full lifecycle of the assets.*
>
> *ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.*
>
> *iii. The risks associated with the options referred to in subparagraph ii.*
>
> *iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service."*

With respect to the requirement to maintain the current levels of service, the current funding level for the road assets appears to be sufficient to sustain the system over the long term. This is discussed further in Sections 8, 9, and 10 of the report.

Observations from Field Review and Data Analysis

During the field review, and in reviewing the data and the needs for the road network, there were several unique aspects of the network that came to light:

- With respect to system and Level of Service measures ;
  - System Adequacy measure for the Niagara-on-the-Lake road system is 86.9% by Centreline kilometres (Cl-km). The system Adequacy would be reduced by 8.29 if the '50 AADT' rule were not recognized. Graph 5 illustrates the system condition measures over time. Section 8 of the report has further discussion on Level of Service measures.
    - The System Adequacy is above the target established by the Ministry of Transportation when condition road funding was provided to municipalities. The targets for system adequacy were
    - 60% for a lower tier system
    - 75% for an upper tier system.
    - 70% for a lower tier urban system

  - 4 Roads is recommending a target System Adequacy of 60% to reflect NotL's functional level.
  - System Adequacy has declined since the last review.
  - Gravel road review was not conducted during spring break-up.
- Weighted Average Pavement Condition is 68.65 (13.73 Structural Adequacy) 4 Roads recommends a minimum of 70 (14 Structural Adequacy). Graph 5 illustrates the condition changes over time. The current condition is below 4 Roads recommended level, but has increased slightly from the last review. Section 8 of the report has further discussion on Level of Service measures.
  - It would cost an estimated $1,195,200 to raise the system condition to 70.
- Good to Very Good roads for the entire system is 69 % when measured by the Structural Adequacy metric (distress). Section 8 of the report has further discussion on Level of Service measures.
- There does not appear to be any capacity issues in the system.%.
- Road width is too narrow on 7.6% (19.674 km) of the road system. This would include the Earth surfaced roads.

- With respect to asset management programming and practices;
  - The directive of O.Reg 588/17 to develop a program to sustain the assets over a 10 year period is more easily achieved managing a single asset. This is significantly more difficult and expensive when managing multiple assets. For example, when road sections, are reconstructed due to the demands of the water and waste water systems, it detracts from road project selection from a pure asset management perspective; however, it is necessary to cross integrate assets in the development of a 'holistic' work plan.
  - The System Adequacy metric is above target but has dropped slightly. The average condition has been has dropped slightly, but is relatively static. Given the directive of 588/17 to sustain the system condition over time, the system performance appears to suggest that a review of funding levels and project selection is in order, to ensure compliance with that directive.
  - The current funding level for Niagara-on-the-Lake appears to be sufficient to sustain the system over the short term, but is dependent/ will be affected by project selection and programming.
  - O.Reg 588/17 requires a work plan developed based on condition data that is no more than two years old. The NotL inspection regimen has not been to that standard. The current project produces road system condition data within two years of the AMP due date (July 2025). As such, the current report is regulatory compliant with respect to road condition data currency.
  - Gravel road conversions are a good asset management practice. Appendix D of this report provides further information on gravel road management.
  - A comparison of replacement costs indicates a 72.3% increase over the 2020 costs at the Long Term Sustainability level and a 16.5% increase at the Short Term Sustainability Level. All formulae are the same as in previous years; the only change is the unit costs.
- With respect to observed defects and needs (discussed further in Section 2.3.2 of this report);
  - Thin lifts of pavements were noted on existing and development road sections. This will introduce all lifecycle costs earlier in the asset life than typically anticipated, increasing annualized costs to sustain the system.
  - Ravelling was noted on a number sections.
  - Apparent premature failure of a number of sections i.e., evidence of fatigue/structural failure and no or few transverse thermal cracks occuring.
  - Widths can vary through a rural cross section.
  - Gravel resurfacing lift thickness is very thin.

- A Resurfacing or Rehabilitation treatment is required on 78.24 CL km of hard top roads (Asphalt and Surface Treated). Of that amount, 13.33 CL km are NOW needs, or are in poor condition.

Needs and Funding Recommendations

Based on the current review of the road system, the current system adequacy measure is 86.3% by Centre Line Kilometres meaning that, 13.7% of the road system, is deficient in the 'NOW' time period and in poor condition. A further 8.29% of the system would be classified as NOW needs, except they have less than 50 AADT, and as such, are deemed Adequate. Gravel roads were not inspected during the spring review.

Based on the current unit costs being experienced, the estimated total cost of recommended improvements is **$68,083,282.** The improvement costs include **$22,788,917** for those roads identified as NOW needs and **$45,294,365** is for road work required in the '1 to 10' year time period or for maintenance. Included in those amounts is **$8,598,702**for work on road sections that are adequate due to low traffic volume or are maintenance or preservation activities.

Based on the composition of the road system, budget recommendations have been developed for annual capital and maintenance programs as follows:

- **$8,530,400**for the annualized Long Term Sustainability based on current replacement cost. This would be considered the long term sustainable funding level. (This would be similar to the PSAB 3150 amortization value except using current replacement cost.). The estimated *replacement cost* of the road system is $426,520,900. The *current value* of the roads system is estimated to be $356,503,000. This represents a 69.8% increase over the 2020 report.

  The design life for a road structure has typically been considered to be 50 years before reconstruction / replacement. However, in an urban setting in particular, with the underground utilities typically having an expected life in the 75 year range, it would seem more pragmatic to match the lifecycles of the road and utility assets. Road assets can be designed to last 75 years with only resurfacing required. Rural cross sections should be treated similarly.

- **$2,004,400**on average annually for hot mix resurfacing, based upon an average 17 (17.3) year cycle. This would approximate an average of 7.1 Cl km per year.
- **$470,600** on average annually, for single surface treatment of existing surface-treated roads, based on a seven-year cycle (this does not include additional padding or geometric correction).
- **$202,600** on average annually for gravel road resurfacing. This estimate is based on resurfacing gravel roads with 75mm every 3 years and utilizing the unit cost for maintenance gravel.
- **$63,700** on average annually for crack sealing on a 5 year cycle.

For modeling purposes, 4 Roads has created a funding level described as 'Short Term Sustainability'. This funding level should theoretically preserve the condition of the road system for up to a 10 year period. The Short Term Sustainability- funding level, is the total of the recommended funding levels for hot mix resurfacing, single surface treatment gravel road resurfacing and crack sealing: **$2,741,200**. The premise being that if the pavement maintenance, preservation and resurfacing programs are adequately funded, then the system should be sustained over the short term. To sustain the road system over the entire life cycle, the Long Term Sustainability funding level is required as ultimately, replacement will be required.

To clarify, the Short Term Sustainability funding level is the required funding level to sustain or improve the road system over the short term; it is *not* the total of all of the above recommendations. Sustainable funding over the long

term or life cycle has to be at the Long Term Sustainability level. The Short Term budget and performance model thereof, are computer derived. Intangible values and decisions and the effects of other external forces cannot be incorporated into the model. As such, the preservation model is the minimum required to maintain the system- in theory. *Theoretically, the 'Short Term Sustainability' funding level would work. Practically, that would rely on every assumption and rating to be absolutely correct, and the program adhered to explicitly. From a more pragmatic perspective and to deal with the real life realities of maintaining a road system, it should be greater*.

Municipal pavement management strategies are critical to managing the performance of the road system, more so, if funding is limited. Funding constraints should push the strategy toward those programs that extend the life cycle of the road by providing the correct treatment at the optimum time. Resurfacing, rehabilitation, and preservation projects should be a higher priority than reconstruction projects. The objective is to "keep the good roads good".

As the municipality advances the development of their Asset Management Plan (AMP), a paradigm shift will be required in the way that we approach management of assets. Traditionally, municipalities have spent a fixed amount on capital and maintenance each year. As evidenced by Table ES 20, programs are not at a consistent funding level on an annual basis. The annual budget overall is met, however, the distribution of costs between traditional capital and maintenance activities varies. That variance is being driven by the demands of the road system based on condition and project selection is based on condition and best Return on Investment. This concept should be applied to all assets.

Re-stated, instead of the traditional capital and maintenance line items, consider the gross budget as the annual reinvestment level, with program funding levels fluctuating within the gross amounts, but driven by asset condition.

The prime goal of any pavement management strategy should be to maintain overall system adequacy. The funding level for road-related programming should be set at a sufficient level so as to ensure that overall system adequacy does not decrease over time.

In addition to the budgetary recommendations, the following recommendations are provided for the management of the road inventory.

1. The information and budget recommendations included in this report be used to further develop the corporate Asset Management Planning.
2. A separate funding source/reserve should be created for the road assets.
3. The funding level should be increased to the Long Term Sustainability funding level over a 10 year period.
4. Funding levels should be adjusted annually to accommodate growth / system expansion.
5. Funding should be adjusted annually to accommodate inflation.
6. The work plan should
    - Ensure that the preservation and resurfacing programs are optimized. This is particularly critical for those sections that are not going to be affected by upgrade due to development demands.
    - The work plan should cross integrate assets.
    - The work plan should be followed to optimize investments and performance of the road system.
7. The road system inspection interval should be no greater than 2 years. (See page 34 of the report)
8. Niagara-on-the-Lake traffic counts should continue to be updated and repeated on a regular basis. The counting should include the percentage of truck traffic.

9. A Roadside Safety Audit should be undertaken to assess the potential safety requirements on rural road sections with potentially substandard alignment.
10. The status of the Boundary Road Agreements should be reviewed.
11. The Level of Service for System Adequacy should be a Minimum of 70%.
12. The Level of Service for Average Condition should be a minimum of 70.
13. The Level of Service for Good to Very Good Roads should be a minimum of 60%.
14. The Quality Assurance Program should be reviewed and refined.
15. Consideration should be given to the development of a maintenance paving program for those roads sections that are in poor condition that will not be addressed in the shorter term programming.
16. Develop a corporate asset management system throughout the organization with the development of a Standard Operating Procedure (SOP) for asset management.
17. Consideration should be given to development of the storm sewer system as a rate supported utility.
18. Consideration should be given to development of Master Drainage Plans for all built up areas
19. Improve the understanding of the evaluation systems being used for various assets.

Summary Information

All tabular data has been adjusted for boundary roads unless otherwise noted

Table ES 1: Boundary Roads Summary

Adjacent Agency	Roadside Environment			Totals (km)
	Rural	Semi Urban	Urban	
City of Niagara Falls	0.96	0	0	**0.96**
City of St. Catherines	3.83	0	0	**3.83**
Grand Total	**4.79**	**0**	**0**	**4.79**
		Adjustment		**2.395**

Table ES 2: Traffic Count History

Year	AADT Counted	AADT Estimated	TOTAL	% OF TOTAL
2006	0.829	0	**0.829**	0.32%
2011	0.638	0.918	**1.556**	0.60%
2012	1.144	0	**1.144**	0.44%
2013	0	0.804	**0.804**	0.31%
2014	0.82	0.094	**0.914**	0.35%
2015	14.504	1.069	**15.573**	5.96%
2016	7.409	0	**7.409**	2.84%
2017	1.863	0	**1.863**	0.71%
2018	11.656	0	**11.656**	4.46%
2019	0.101	0	**0.101**	0.04%
2020	9.49	0	**9.49**	3.63%
2021	1.021	0	**1.021**	0.39%
2023	53.042	155.701	**208.743**	79.95%
TOTAL	**102.517**	**158.586**	**261.103**	
% OF TOTAL	0.3926	0.6074		

Note: Not adjusted for Boundary Roads

Table ES 3: Classification by Roadside Environment and Surface Type

Material Description	Roadside Environment						TOTAL		% OF TOTAL	
	Rural		Semi Urban		Urban					
	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km
Earth	16.723	33.446	0	0	0	0	**16.723**	**33.446**	6.46%	6.45%
Gravel, Stone, Other Loosetop	14.7	29.4	0.192	0.384	0	0	**14.892**	**29.784**	5.76%	5.74%
High Class Bit.-asphalt	39.026	78.052	27.02	54.193	55.327	111.659	**121.373**	**243.904**	46.92%	47.03%
Low Class Bit.-surface treated	95.739	191.478	9.708	19.416	0.271	0.542	**105.718**	**211.436**	40.86%	40.77%
TOTAL	**166.188**	**332.376**	**36.92**	**73.993**	**55.598**	**112.201**	**258.706**	**518.57**		
% OF TOTAL	64.24%	64.09%	14.27%	14.27%	21.49%	21.64%				

Table ES 4: Classification by Roadside Environment and Functional Class (Inventory Manual)

Subtype	Lanes	Roadside Environment						TOTAL		% OF TOTAL	
		Rural		Semi Urban		Urban					
		Repl. Cost	CI km	Repl. Cost	CI km	Repl. Cost	CI km	Repl. Cost	CI km	Repl. Cost	CI km
100	2	9,637,298	26.426	0	0.000	0	0.000	**9,637,298**	**26.426**	2.26%	10.12%
200	2	19,481,547	19.982	0	0.000	0	0.000	**19,481,547**	**19.982**	4.57%	7.65%
300	2	29,580,797	28.663	0	0.000	0	0.000	**29,580,797**	**28.663**	6.94%	10.98%
400	2	55,870,983	40.258	0	0.000	0	0.000	**55,870,983**	**40.258**	13.10%	15.42%
500	2	48,516,940	31.719	0	0.000	0	0.000	**48,516,940**	**31.719**	11.38%	12.15%
600	2	19,043,023	10.050	0	0.000	0	0.000	**19,043,023**	**10.050**	4.46%	3.85%
700	2	14,829,626	7.346	0	0.000	0	0.000	**14,829,626**	**7.346**	3.48%	2.81%
800	2	8,312,085	4.141	0	0.000	0	0.000	**8,312,085**	**4.141**	1.95%	1.59%
C/R	2	0	0.000	3,090,509	2.239	6,257,571	1.912	**9,348,080**	**4.151**	2.19%	1.59%
C/R	3	0	0.000	345,388	0.153	1,224,875	0.304	**1,570,263**	**0.457**	0.37%	0.18%
CCI	2	0	0.000	0	0.000	572,998	0.152	**572,998**	**0.152**	0.13%	0.06%
CCI	3	0	0.000	0	0.000	2,772,342	0.597	**2,772,342**	**0.597**	0.65%	0.23%
L/R	1	0	0.000	0	0.000	272,978	0.097	**272,978**	**0.097**	0.06%	0.04%
L/R	2	0	0.000	34,779,762	33.263	165,380,057	51.058	**200,159,819**	**84.321**	46.93%	32.29%
L/R	3	0	0.000	0	0.000	750,792	0.201	**750,792**	**0.201**	0.18%	0.08%
LCI	2	0	0.000	1,611,535	1.265	4,189,766	1.277	**5,801,301**	**2.542**	1.36%	0.97%
TOTAL		**205,272,299**	**168.585**	**39,827,194**	**36.920**	**181,421,379**	**55.598**	**426,520,872**	**261.103**		
% OF TOTAL		48.13%	64.57%	9.34%	14.14%	42.54%	21.29%				

Not adjusted for Boundary Roads

Table ES 5: Average Replacement Costs by Asset Class

Asset Class for Performance Modelling	Roadside Environment						TOTAL		% OF TOTAL		Cost / km ($)
	Rural		Semi Urban		Urban						
	Repl. Cost	Cl-km	Repl. Cost	Cl-km	Repl. Cost	Cl-km	Repl. Cost	Cl-km	Repl. Cost	Cl-km	
ETH-R	0	16.723	0	0	0	0	**0**	**16.723**		6.40%	0
GST1-R	14,550,776	14.7	0	0	0	0	**14,550,776**	**14.7**	3.41%	5.63%	989,849
GST1-S	0	0	201,741	0.192	0	0	**201,741**	**0.192**	0.05%	0.07%	1,050,734
HCB2-U	60742862	34.192	0	0	0	0	**60,742,862**	**34.192**	14.24%	13.10%	1,776,523
HCB3-R	0	0	8303553	6.946	0	0	**8,303,553**	**6.946**	1.95%	2.66%	1,195,444
HCB3-S	0	0	0	0	38633454	11.429	**38,633,454**	**11.429**	9.06%	4.38%	3,380,300
HCB3-U	9137815	6.75	0	0	0	0	**9,137,815**	**6.75**	2.14%	2.59%	1,353,750
HCB4-R	0	0	21391070	20.074	0	0	**21,391,070**	**20.074**	5.02%	7.69%	1,065,611
HCB4-S	0	0	0	0	141918753	43.898	**141,918,753**	**43.898**	33.27%	16.81%	3,232,921
HCB4-U	120840846	96.22	0	0	0	0	**120,840,846**	**96.22**	28.33%	36.85%	1,255,881
LCB1-R	0	0	9930830	9.708	0	0	**9,930,830**	**9.708**	2.33%	3.72%	1,022,953
LCB1-S	0	0	0	0	869172	0.271	**869,172**	**0.271**	0.20%	0.10%	3,207,277
LCB1-U	205272299	168.585	39827194	36.92	181,421,379	55.598	**426,520,872**	**261.103**			1,633,535
TOTAL	**0**	**0.6457**	**0**	**0.1414**	**0**	**0.2129**					
% OF TOTAL	0	16.723	0	0	0	0	**0**	**16.723**		6.40%	0

Not adjusted for Boundary Roads

Table ES 6: Classification by Ontario Regulation 239/02 Classification -Minimum Maintenance Standards for Municipal Highways

Roadside Environment	O.Reg 239/02 Classification 3		4		5		6		Totals		% of Totals	
	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km
Rural	42.228	84.456	79.873	159.746	17.336	34.672	29.148	58.296	168.585	337.17	64.57%	64.42%
Semi Urban	0.148	0.296	2.244	4.641	25.858	51.716	8.67	17.34	36.92	73.993	14.14%	14.14%
Urban	0.386	0.772	2.584	6.069	40.719	81.542	11.909	23.818	55.598	112.201	21.29%	21.44%
TOTAL	**42.762**	**85.524**	**84.701**	**170.456**	**83.913**	**167.93**	**49.727**	**99.454**	**261.103**	**523.364**		
% of Total	16.38%	16.34%	32.44%	32.57%	32.14%	32.09%	19.04%	19.00%				

Table ES 7: Classification by O.Reg 588/17 Road Classification by Lanes and Roadside Environment (*Dec 27, 2017*)

O.Reg 588/17 Classification	Roadside Environment Rural		Semi Urban		Urban		Totals		% of Totals	
	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km
Collector	122.101	244.202	2.392	4.937	2.97	6.841	**127.463**	**255.98**	48.82%	48.91%
Local	46.484	92.968	34.528	69.056	52.628	105.36	**133.64**	**267.384**	51.18%	51.09%
TOTAL	**168.585**	**337.17**	**36.92**	**73.993**	**55.598**	**112.201**	**261.103**	**523.364**		
% of Total	64.57%	64.42%	14.14%	14.14%	21.29%	21.44%				

Table ES 8: O.Reg 588/17 Level of Service Measures for Roads

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)	Level of Services Measure for Roads	
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality. **132.83** sq. km	Arterial Roads = Collector Roads = Local Roads =	0% 192.7% 201.3%
	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).	Weighted Average Overall road condition is Weighted average paved road condition is Weighted average gravel road condition is	68.7 73.3 63.4

Table ES 9: Time of Need by Length and MMS Class –All Needs

Time of Need	O.Reg 239/02 Classification								TOTAL		% OF TOTAL	
	3		4		5		6					
	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km
1 to 5	6.12	12.24	10.143	20.44	10.654	21.308	1.395	2.79	**28.312**	**56.778**	10.84%	10.85%
6 to10	11.847	23.694	25.195	50.54	20.215	40.43	4.278	8.556	**61.535**	**123.22**	23.57%	23.54%
ADEQ	17.207	34.414	33.232	67.214	45.335	90.871	39.8	79.6	**135.574**	**272.099**	51.92%	51.99%
NOW	7.588	15.176	16.131	32.262	7.709	15.321	4.254	8.508	**35.682**	**71.267**	13.67%	13.62%
TOTAL	**42.762**	**85.524**	**84.701**	**170.456**	**83.913**	**167.93**	**49.727**	**99.454**	**261.103**	**523.364**		
% OF TOTAL	16.01%	16.00%	35.62%	35.72%	31.53%	31.47%	16.78%	16.75%				
System Adequacy	82.3%	82.3%	81.0%	81.1%	90.8%	90.9%	91.4%	91.4%	**86.3%**	**86.4%**		

Note: ****Includes all potential Time of Needs elements including Capacity, Drainage, Surface Width, Surface Type, Geometry and Structural Adequacy***
****Roads with AADT<50 are deemed ADEQ; % of the system has <50 AADT***
Not adjusted for Boundary Roads

Table ES 10: Drainage by Time of Need

Roadside Environment	Time of Need				TOTAL	% OF TOTAL
	1 to 5	6 to 10	ADEQ	NOW		
Rural	13.245	60.225	92.718	0	**166.188**	64.24%
Semi Urban	2.802	24.116	10.002	0	**36.920**	14.27%
Urban	0.086	0.149	55.363	0	**55.598**	21.49%
TOTAL	**16.133**	**84.490**	**158.083**	**0**	**258.706**	
% OF TOTAL	6.24%	32.66%	61.11%	0%		

Table ES 11: Drainage by Roadside Environment and Drainage Type

Drainage Type	Roadside Environment			TOTAL	% OF TOTAL
	Rural	Semi Urban	Urban		
AS - Adjacent Road, storm sewer	0	0.289	0.131	**0.42**	0.16%
DS - Ditch and Storm Sewer	6.233	17.089	1.302	**24.624**	9.52%
N - None	2.156	8.193	0	**10.349**	4.00%
OD - Open Ditch	157.663	10.577	2.268	**170.508**	65.91%
SS - Storm Sewer	0.137	0.772	51.897	**52.806**	20.41%
TOTAL	**166.188**	**36.92**	**55.598**	**258.706**	
% OF TOTAL	64.24%	14.27%	21.49%		

Table ES 12: Capacity by Time of Need

Roadside Environment	Time of Need				TOTAL	% OF TOTAL
	1 to 5	6 to 10	ADEQ	NOW		
Rural	0	0	168.585	0	168.585	64.57%
Semi Urban	0	0	36.92	0	36.92	14.14%
Urban	0	0	55.598	0	55.598	21.29%
TOTAL	**0**	**0**	261.1	**0**	261.1	
% OF TOTAL	0%	0%	100.00%	0%		

Table ES 13: Structural Adequacy by Time of Need

Roadside Environment	Time of Need				TOTAL	% OF TOTAL
	1 to 5	6 to 10	ADEQ	NOW		
Rural	17.829	41.641	79.329	27.389	**166.188**	64.24%
Semi Urban	6.689	14.7	9.104	6.427	**36.92**	14.27%
Urban	3.794	5.247	45.939	0.618	**55.598**	21.49%
TOTAL	**28.312**	**61.588**	**134.372**	**34.434**	**258.706**	
% OF TOTAL	10.94%	23.81%	51.94%	13.31%		

Table ES 14: Width by Time of Need

Roadside Environment	Time of Need		TOTAL	% OF TOTAL
	ADEQ	NOW		
Rural	148.996	17.193	**166.188**	64.24%
Semi Urban	34.536	2.384	**36.92**	14.27%
Urban	55.501	0.097	**55.598**	21.49%
TOTAL	**239.033**	**19.674**	**258.706**	
% OF TOTAL	92.40%	7.60%		

Table ES 15: Surface Type by Time of Need

Roadside Environment	Time of Need		TOTAL	% OF TOTAL
	ADEQ	NOW		
Rural	165.349	0.839	166.188	64.24%
Semi Urban	36.728	0.192	36.92	14.27%
Urban	55.598	0	55.598	21.49%
TOTAL	**257.675**	**1.031**	**258.706**	
	99.60%	0.40%		

Table ES 16: Geometry by Time of Need

Roadside Environment	Time of Need		TOTAL	% OF TOTAL
	ADEQ	NOW		
Rural	165.927	0.261	**166.188**	64.24%
Semi Urban	36.92	0	**36.92**	14.27%
Urban	55.598	0	**55.598**	21.49%
TOTAL	**258.445**	**0.261**	**258.706**	
% OF TOTAL	99.90%	0.10%		

Does not indicate that there are not sub standard Horizonal and Vertical Alignment

**** Appendix H list sections with potentially substandard alignment, which should be reviewed***

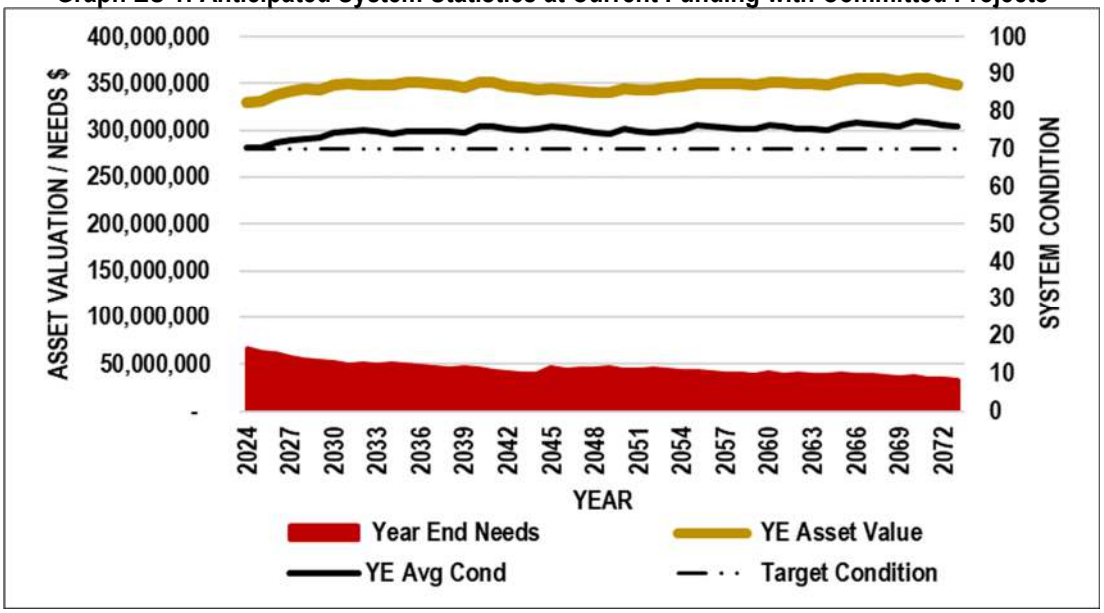
Table ES 17: Improvement Costs by Improvement Type and Roadside Environment per Centre Line Kilometre

Improvement Class	Improvement ID / Description		Roadside Environment						Total		%Total		Average Cost /km	Rural Average	Semi Urban Average	Urban Average
			Rural		Semi Urban		Urban									
			Imp. Cost	Cl-km	Imp. Cost	Cl-km	Imp. Cost	Cl-km	Imp. Cost	Cl-km	Imp. Cost	Cl-km				
Const	BS	Base and Surface	13,668,982	19	796,044	1.342	0	0	**14,465,026**	**20.733**	21.25%	8.01%	697,681	704,914	593,177	NA
Const	NONE	No Improvement Required	0	60.23	0	6.11	0	34.198	**0**	**100.538**		38.86%				
Const	REC	Reconstruction - Rural	2,437,162	2	1,628,904	1.583	0	0	**4,066,067**	**3.585**	5.97%	1.39%	1,134,189	1,217,364	1,028,998	NA
Const	RMrural	Major Resurfacing-Rural	0	0	77,342	0.148	0	0	**77,342**	**0.148**	0.11%	0.06%	522,581	NA	522,581	
Const	RNS	Reconstruction Nominal Storm Sewer	0	0	112,644	0.101	0	0	**112,644**	**0.101**	0.17%	0.04%	1,115,287	NA	1,115,287	
Const	RSS	Reconstruction with Storm Sewers	0	0	26,168,676	8.232	0	0	**26,168,676**	**8.232**	38.44%	3.18%	3,178,897	NA	3,178,897	
Const	RW	Resurface and Widen	0	0	464,018	1	180,478	0	**644,496**	**1.514**	0.95%	0.59%	425,691	NA	340,439	1,195,219
Const	SRR	Storm Sewer and Road Reinstatement	0	0	5,639,805	3.206	0	0	**5,639,805**	**3.206**	8.28%	1.24%	1,759,141	NA	1,759,141	
Maint	CRK	Crack Sealing	2,118	1	2,005	1	21,431	8	**25,554**	**9.943**	0.04%	3.84%	2,570	2,570	2,571	2,570
Maint	CRKsd	Crack Sealing and Spot Drainage	0	0	18,498	1.244	0	0	**18,498**	**1.244**	0.03%	0.48%	14,870	NA	14,870	NA
Maint	MICRO	Microsurfacing	0	0	5,470	0	168,790	3	**174,259**	**3.587**	0.26%	1.39%	48,581	NA	35,752	49,153
Maint	SD	Spot Drainage	333,035	20	145,730	9	2,444	0	**481,209**	**29.070**	0.71%	11.24%	16,553	16,623	16,400	16,403
Maint	SR	Spot Repairs	0	0	0	0	0	0.229	**0**	**0.229**		0.09%	NA	NA	NA	NA
Rehab	DSTrehab	Double Surface Treatment Rehabilitation	3,242,630	15.407	0	0	0	0	**3,242,630**	**15.407**	4.76%	5.96%	210,465	210,465	NA	NA
Rehab	PR2	Pulverize and Resurface 2 - 100mm	4,271,902	14	102,329	0.366	0	0	**4,374,231**	**14.326**	6.42%	5.54%	305,335	306,010	279,587	NA
Rehab	R1	Basic Resurfacing 1 - 50mm	1,202,221	8	303,718	2	2,321,239	5	**3,827,179**	**15.349**	5.62%	5.93%	249,344	149,233	132,339	464,434
Rehab	R2	Basic Resurfacing 2 - 100mm	1,028,173	4	345,290	1	2,465,538	4	**3,839,001**	**9.229**	5.64%	3.57%	415,972	255,892	310,792	601,351
Rehab	SST++	SST, 10% Base Repairs, Minor Ditching	639,889	13.372	0	0	0	0	**639,889**	**13.372**	0.94%	5.17%	47,853	47,853	NA	NA
Rehab	SST+	Single Surface Treatment and Minor Ditching	85,958	2.391	0	0	0	0	**85,958**	**2.391**	0.13%	0.92%	35,951	35,951	NA	NA
Rehab	SST	Single Surface Treatment	200,820	6.504	0	0	0	0	**200,820**	**6.504**	0.29%	2.51%	30,876	30,876	NA	NA
TOTAL			**27,112,889**	**166.188**	**35,810,473**	**36.920**	**5,159,919**	**55.598**	**68,083,282**	**258.706**						
% OF TOTAL			39.82%	64.24%	52.60%	14.27%	7.58%	21.49%								

Table ES 18: Improvement Costs by Improvement Type and Time of Need

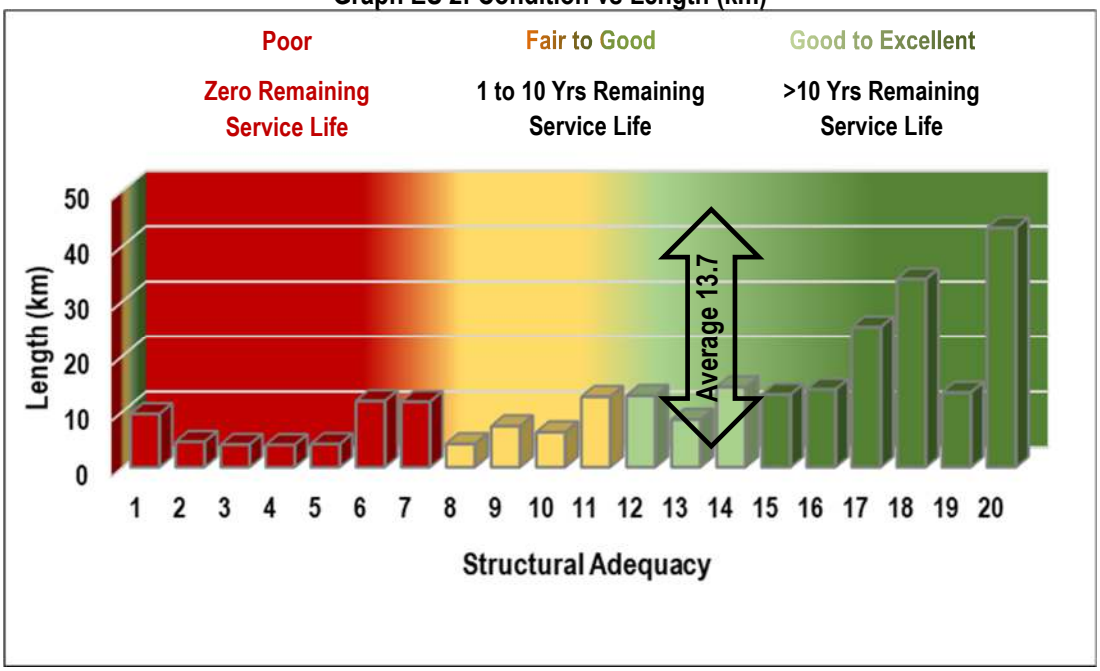
Improvement Class	Improvement ID / Description		Time of Need								TOTAL		% OF TOTAL	
			1 to 5		6 to 10		ADEQ		NOW					
			Imp. Cost	Cl km	Imp. Cost	Cl km	Imp. Cost	Cl km	Imp. Cost	Cl km	Imp. Cost	Cl km	Imp. Cost	Cl km
Const	BS	Base and Surface	1,049,734	2.021	336,480	0.611	6,155,469	4.194	6,923,343	13.907	**14,465,026**	**20.733**	21.25%	8.01%
Const	NONE	No Improvement Required	0	0.086	0	0		99.019		1.433		**100.538**		38.86%
Const	REC	Reconstruction - Rural	1584196	1.25		0	444,448	0.273	2,037,422	2.062	**4,066,067**	**3.585**	5.97%	1.39%
Const	RMrural	Major Resurfacing	0	0		0		0	77,342	0.148	**77,342**	**0.148**	0.11%	0.06%
Const	RNS	Reconstruction Nominal Storm Sewer	0	0	112,644	0.101		0		0	**112,644**	**0.101**	0.17%	0.04%
Const	RSS	Reconstruction with Storm Sewers	11240570	3.561	4,227,717	1.363	882,170	0.264	9,818,219	3.044	**26,168,676**	**8.232**	38.44%	3.18%
Const	RW	Resurface and Widen	0	0	47,113	0.17	180,478	0.151	416,905	1.193	**644,496**	**1.514**	0.95%	0.59%
Const	SRR	Storm Sewer and Road Reinstatement	0	0	5,639,805	3.206		0		0	**5,639,805**	**3.206**	8.28%	1.24%
Maint	CRK	Crack Sealing	0	0		0	25,554	9.943		0	**25,554**	**9.943**	0.04%	3.84%
Maint	CRKsd	Crack Sealing and Spot Drainage	0	0	16,283	1.095	2,216	0.149		0	**18,498**	**1.244**	0.03%	0.48%
Maint	MICRO	Microsurfacing	0	0	5,470	0.153	168,790	3.434		0	**174,259**	**3.587**	0.26%	1.39%
Maint	SD	Spot Drainage	2427	0.148	348,582	21.255	121,524	7.138	8,676	0.529	**481,209**	**29.07**	0.71%	11.24%
Maint	SR	Spot Repairs	0	0		0.1		0		0.129		**0.229**		0.09%
Rehab	DSTrehab	Double Surface Treatment Rehabilitation	2177879	10.633	530,525	2.283	191,446	0.814	342,779	1.677	**3,242,630**	**15.407**	4.76%	5.96%
Rehab	PR2	Pulverize and Resurface 2 - 100mm	1,350,132	5.106		0	126,331	0.245	2,897,768	8.975	**4,374,231**	**14.326**	6.42%	5.54%
Rehab	R1	Basic Resurfacing 1 - 50mm	113,436	0.84	3,703,211	14.431	10,532	0.078		0	**3,827,179**	**15.349**	5.62%	5.93%
Rehab	R2	Basic Resurfacing 2 - 100mm	2,550,779	4.667	1,064,273	4.17		0	223,949	0.392	**3,839,001**	**9.229**	5.64%	3.57%
Rehab	SST++	SST, 10% Base Repairs, Minor Ditching	0	0	549,163	11.373	48,212	1.054	42,514	0.945	**639,889**	**13.372**	0.94%	5.17%
Rehab	SST+	Single Surface Treatment and Minor Ditching	0	0	45,244	1.277	40,714	1.114		0	**85,958**	**2.391**	0.13%	0.92%
Rehab	SST	Single Surface Treatment	0	0	0	0	200,820	6.504		0	**200,820**	**6.504**	0.29%	2.51%
TOTAL			**20,069,154**	**28.312**	**16,626,509**	**61.588**	**8,598,702**	**134.372**	**22,788,917**	**34.434**	**68,083,282**	**258.706**		
% OF TOTAL			29.48%	10.94%	24.42%	23.81%	12.63%	51.94%	33.47%	13.31%				

Graph ES 1: Anticipated System Statistics at Current Funding with Committed Projects



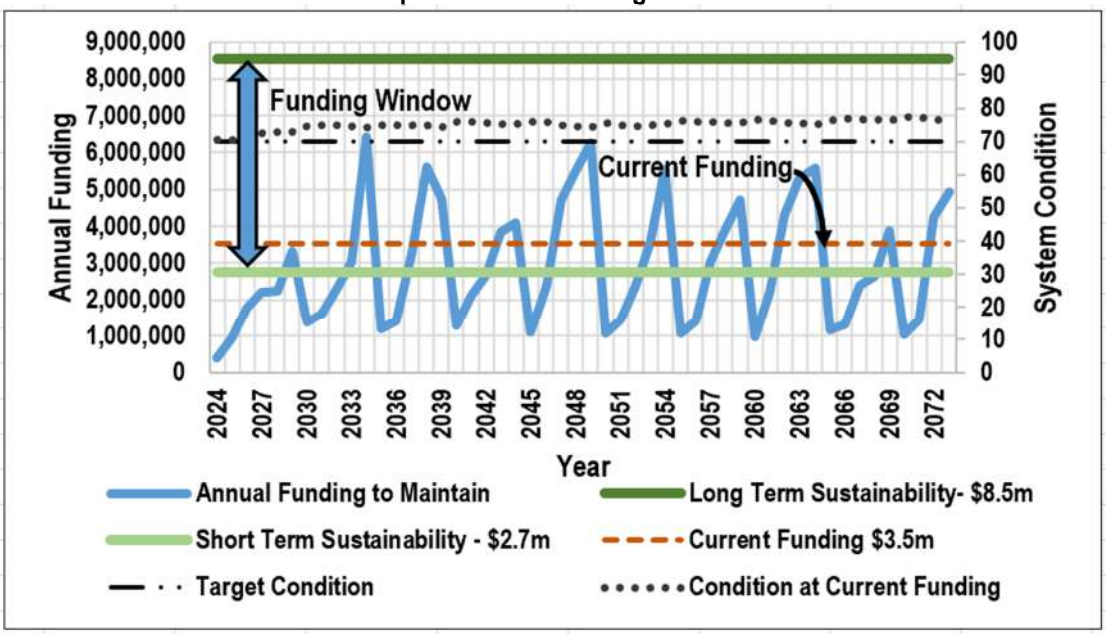
Assumes perpetual pavement performance, Does not anticipate WWW or expansion influences

Graph ES 2: Condition vs Length (km)

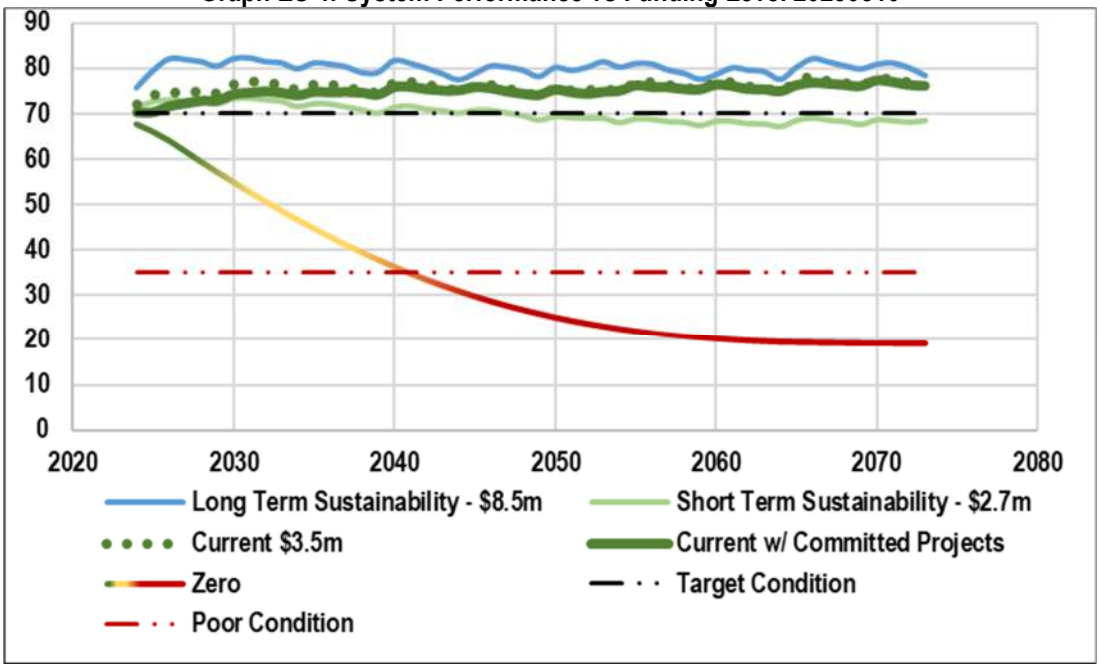


Note: Physical Condition is Structural Adequacy multiplied by 5; Average is 68.7 recommended 70 or greater

Graph ES 3: The Funding Window



Graph ES 4: System Performance vs Funding Level 20230810



Graph ES 5: System Condition Measures vs Time

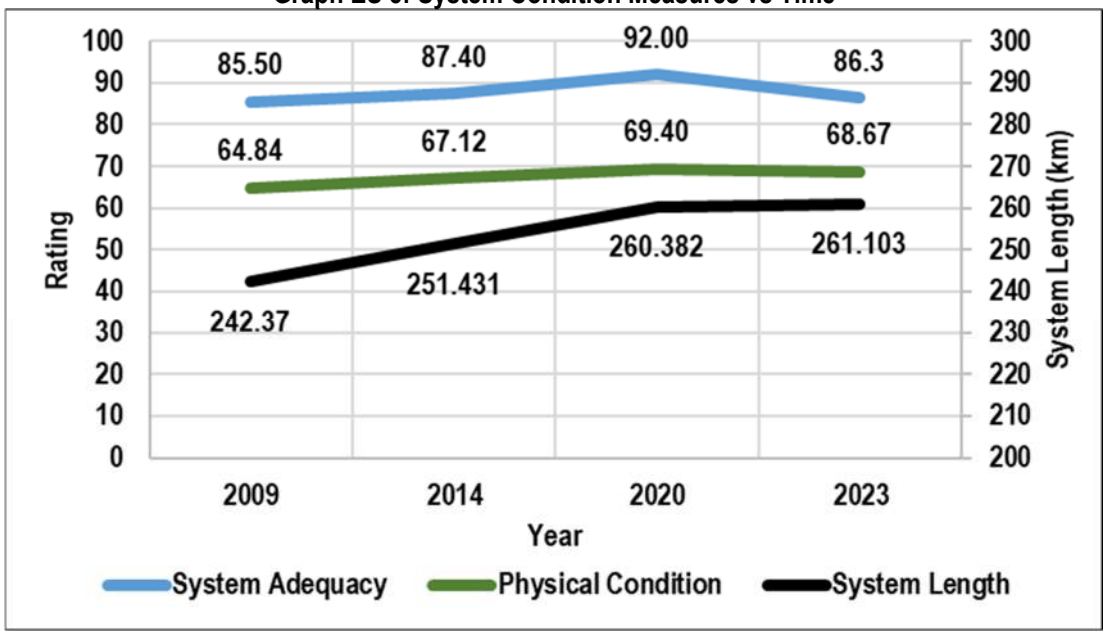


Table ES 19: Good to Very Good Roads by Structural Adequacy

Structural Adequacy	Roadside						Description	TOTAL		% OF TOTAL	
	Rural		Semi Urban		Urban						
	CL-Km	Lane-Km	CL-Km	Lane-Km	CL-Km	Lane-Km		CL-Km	Lane-Km	CL-Km	Lane-Km
1	9.536	19.072	0	0	0	0	Poor	**9.536**	**19.072**	3.69%	3.68%
2	4.539	9.078	0	0	0	0	Poor	**4.539**	**9.078**	1.75%	1.75%
3	3.982	7.964	0.063	0.126	0	0	Poor	**4.045**	**8.09**	1.56%	1.56%
4	3.542	7.084	0.448	0.896	0	0	Poor	**3.99**	**7.98**	1.54%	1.54%
5	2.4	4.8	1.748	3.496	0	0	Poor	**4.148**	**8.296**	1.60%	1.60%
6	9.836	19.671	1.856	3.712	0.171	0.342	Poor	**11.863**	**23.725**	4.59%	4.58%
7	9.958	19.916	1.408	2.816	0.35	0.7	Poor	**11.716**	**23.432**	4.53%	4.52%
8	3.152	6.303	1.02	2.04	0	0	Fair	**4.172**	**8.343**	1.61%	1.61%
9	5.495	10.99	0.965	1.93	0.875	1.75	Fair	**7.335**	**14.67**	2.84%	2.83%
10	3.462	6.924	1.544	3.088	1.249	2.498	Fair	**6.255**	**12.51**	2.42%	2.41%
11	7.913	15.826	3.111	6.222	1.584	3.322	Fair	**12.608**	**25.37**	4.87%	4.89%
12	9.079	18.158	0.979	1.958	2.744	5.638	Good	**12.802**	**25.754**	4.95%	4.97%
13	7.015	14.03	0.817	1.634	0.686	1.372	Good	**8.518**	**17.036**	3.29%	3.29%
14	11.355	22.71	1.322	2.644	1.668	3.336	Good	**14.345**	**28.69**	5.54%	5.53%
15	9.336	18.672	1.296	2.592	2.401	4.802	Good to Very Good	**13.033**	**26.066**	5.04%	5.03%
16	5.319	10.638	2.134	4.268	6.488	13.177	Good to Very Good	**13.941**	**28.083**	5.39%	5.42%
17	13.279	26.557	3.032	6.217	8.961	18.015	Good to Very Good	**25.272**	**50.789**	9.77%	9.79%
18	26.293	52.585	1.183	2.366	6.488	12.976	Good to Very Good	**33.964**	**67.927**	13.13%	13.10%
19	4.634	9.268	2.978	5.956	5.773	11.953	Good to Very Good	**13.385**	**27.177**	5.17%	5.24%
20	16.065	32.13	11.016	22.032	16.16	32.32	Good to Very Good	**43.241**	**86.482**	16.71%	16.68%
TOTAL	**166.188**	**332.376**	**36.92**	**73.993**	**55.598**	**112.201**		**258.706**	**518.57**		
% OF TOTAL	64.24%	64.09%	14.27%	14.27%	21.49%	21.64%					
%Poor	26.4%	26.4%	15.0%	14.9%	0.9%	0.9%		**19.3%**	**19.2%**		
%Fair	12.0%	12.0%	18.0%	17.9%	6.7%	6.7%		**11.7%**	**11.7%**		
%Good to Very Good	61.6%	61.6%	67.1%	67.1%	92.4%	92.3%		**69.0%**	**69.0%**		

Note: Based on Structural Adequacy Rating only

Table ES 20: 10 Year Program from Performance Model at Current Funding Level with Committed Projects (20231106)

Improvement Type	Year										Grand Total
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
BS							660,293	1,211,398	2,242,361		**4,114,052**
CRK	21,536	4,016		78,407	815	11,362	101,115	29,765	31,013	20,465	**298,494**
CRKsd					2,186	5,919	3,376	7,018			**18,499**
DSTrehab			559,711	1,444,730	845,076	268,352					**3,117,869**
GRR									52,416		**52,416**
GRR2					73,361	97,997		426,087	105,134	73,361	**775,940**
MICRO						7,994	66,151	84,019	10,626		**168,790**
PR2	199,670	987,443	2,349,838	710,950	126,331						**4,374,232**
R1	580,000		253,282		581,704	1,769,328	1,450,114	1,570,391	729,528	3,091,678	**10,026,025**
R2			223,949	1,246,068	1,725,431	1,037,598			36,100		**4,269,146**
REC	1,900,000										**1,900,000**
RMrural							80,656				**80,656**
RSS		2,405,501									**2,405,501**
SD		44,493	117,638	41,804	43,967	111,045	11,398	50,101	14,695	1,066	**436,207**
SST	117,519	83,301		2,406	125,728	214,969	1,151,815	145,741	302,175	338,170	**2,481,824**
SST+	85,958										**85,958**
SST++	619,439		20,450								**639,889**
Grand Total	**3,524,122**	**3,524,754**	**3,524,868**	**3,524,365**	**3,524,599**	**3,524,564**	**3,524,918**	**3,524,520**	**3,524,048**	**3,524,740**	**35,245,498**

Note: Performance Model is based on the current funding level and includes committed projects It does not account for expansion projects.

Table ES 21: Improvement Type Abbreviation Summary

Inventory Manual Improvements or Modified Inventory Manual Improvements	
Code	**Description**
R1	Basic Resurfacing, Basic Resurfacing
R2, MSR, MUR	Basic Resurfacing – Double Lift,
RM, RMrural	Major Resurfacing – removes existing asphalt and replace with existing plus and additional lift.
PR1	Pulverizing and Resurfacing
PR2, PR3	Pulverizing and Resurfacing – Double Lift or Triple Lift
BS	Tolerable standard for lower volume roads: – Rural and Semi-Urban Cross sections only. Improves drainage and adds structure (granular base) and a surface but not to a reconstruct standard. Typically specified where width is to an acceptable standard.
RW	Resurface and Widen- adds additional lanes and resurfaces the entire road
REC	Reconstruction
RNS,	Urban Reconstruction with Nominal Sewers
RSS,	Urban Reconstruction with Storm Sewers
NC	Proposed Road Construction
SRR	Storm Sewer Installation and Road Reinstatement
SR	Spot Road Improvement
SD	Spot Drainage
CO	Carry Over project
Additional Treatments	
CRK	Crack sealing
SDcrk	Crack Sealing and Spot Drainage
DST	Double Surface Treatment
DSTrehab	Pulverize and existing surface treated road, add 150mm of gravel, double surface treat, and spot drainage improvements. Typically specified where the road appears to be structurally sound but the surface treatment is deteriorated beyond the point where it should not be re surface treated.
DSTrehab2	As DSTrehab, substituting 150mm of gravel,
GRR	Gravel road resurfacing 75mm
GRRsd	Gravel road resurfacing 75mm and spot drainage
GRR2	Gravel road resurfacing 150mm
GRRsd	Gravel road resurfacing 150mm and Spot Drainage
MICRO	Microsurfacing
SST	Single Surface Treatment
SSTsd	Single Surface Treatment and minor ditching
SSTsd-base	Single Surface Treatment, 10% base repairs and minor ditching

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1 Project Scope

The scope of this report is to prepare a State of the Infrastructure (SOTI) report that includes:

- Field review and condition rating on all of the road assets within the Niagara-on-the-Lake road system.
- Updated dimensional information, where improvements have occurred.
- Add or change road sections to better reflect the constitution of the road system, as required.
- Develop updated replacement and improvement costs for each road asset, based on current unit costs and standard formulae from the Inventory Manual for Municipal Roads, 1991.
- Develop/review recommendations for improvement and associated costing on deficient assets.
- Develop recommendations for annual budgets based on current costs for Long Term Sustainability and major program areas based on updated unit costs.
- Develop analysis on the effect of current and recommended budgets on overall system performance.
- Develop a 10 year work plan.
- Provide Asset Management Strategy recommendations.
- Provide the answers to the basic asset management questions;
    - What you have?
    - Where it's located?
    - What condition is it in?
    - What is it worth?
    - What will it cost to replace it?
    - Useful remaining life?
    - What service level will be required over the service life?
- A report on the foregoing.
- An updated geodatabase

The 2023 State of the Infrastructure Report summarizes the road system survey conducted during the spring and summer of 2023. Gravel Roads were *not* reviewed during the spring breakup. The field review of the system was undertaken in mid to late June 2023. The report includes condition updates on projects that will be completed subsequent to the field work, including rehabilitations, resurfacing, and reconstruction and capital works in progress. The survey identifies the condition of each road asset by its time of need and recommended maintenance, rehabilitation or reconstruction treatment.

The report provides an overview of the physical and financial needs of the road system in its entirety as well as by road section. Both information sources are used to develop programming and budgets. However, once a road section reaches the project design stage, further detailed review, investigation, and design will be required to address the specific requirements of the specific project.

This report should not be confused with a road safety audit. A road safety audit is the formal safety performance examination of an existing or future road or intersection, which qualitatively estimates and reports on potential road safety issues, and identifies opportunities for improvements for all road users. Typically, and more predominantly in a lower tier, rural municipality on lower volume road sections, the road system has some deficiencies with the existing horizontal and vertical alignment.

Niagara-on-the-Lake staff provided information with respect to their database/network, and updated unit costs from current tenders.

2 Introduction and Background

Road Needs Studies (RNS) were implemented by the Ministry of Transportation Ontario (MTO) in the 1960's, and evolved into the current methodology by the late 1970's. The most current version of the Inventory Manual for Municipal Roads is dated 1991, and is the methodology used for this report.

The process was originally created by the MTO as a means to distribute conditional funding, on an equitable basis, between municipalities. The practice was discontinued by a number of municipalities, when conditional funding for roads was eliminated in the mid 1990's. The RNS process is a sound, consistent asset management practice that still works well today, and in view of the increasing demands on efficiency and asset management, represents a sound business practice that is beneficial to continue.

To put the Road Needs Study in a more current context, the State of the Infrastructure (SotI) is essentially a Road Needs Study.

In August 2012, the Province of Ontario, introduced a requirement for an Asset Management Plan (AMP) as a prerequisite for municipalities seeking funding assistance for capital projects from the province; effectively creating a conditional grant. To qualify for future infrastructure grants, an AMP had to be developed and approved by a municipal council by December 2013. On April 26, 2013 the province announced that it had created a $100 million Infrastructure Fund for small, rural and northern municipalities.

Subsequently, the province has introduced further initiatives for infrastructure funding: Ontario Community Infrastructure Fund (OCIF) and the Small Communities Fund (SCF). An Asset Management Plan (AMP) approved by Council is required as part of the submission for OCIF Applications. Asset Management Plans were to be reviewed for comprehensiveness.

On December 27, 2017, the Province filed Regulation 588/17, Asset Management Planning for Municipal Infrastructure. The regulation identifies provincial requirements and timelines for development and implementation of asset management plans. Initially, AMP's will have to include the 'core' assets; water and waste water linear and treatment, roads, bridge and culvert structures, and storm water linear and treatment.

Regulation 588/17 requires an Asset Management Plan (AMP) for core assets by July 1, 2022 and an Asset Management Plan for all assets by July 1, 2025, that is based on condition data that is no more than two years old. This project positions NotL well for compliance with the Regulation with respect to the roads data.

Key elements of O.Reg 588/17 include

- The AMP has to sustain the condition of the assets. (This is typically a function of adequate budget and appropriate programming)
- The AMP has to be approved by the Executive Lead
- The AMP has to be approved by Council
- The status of the AMP has to be reported on annually

The assumption is that a valid AMP will be a potential requirement for some provincial grants in the future. Conditional Grants are not new to Ontario. Until the mid-1990's, Road Needs Studies (RNS) were completed by municipalities and submitted to the Ministry of Transportation (MTO) on an annual basis in order to receive provincial funding for their road programs.

Niagara-on-the-Lake is currently evolving the AMP for the various asset groups, roads being one of them. A key component of the AMP is a *'State of the Infrastructure'* (SotI) review of the asset or asset group. This report provides

the SotI review of the Niagara-on-the-Lake road system and also provides recommendations for budgets and road asset programming, effectively an Asset Management Plan for Roads.

The scope of this report is to prepare a State of the Infrastructure (SOTI) report that includes:

- Field review and condition rating on all of the road assets within the Niagara-on-the-Lake road system.
- Updated Dimensional information, where improvements have occurred.
- Add or change road sections to better reflect the constitution of the road system, as required.
- Develop replacement costs for each road asset, based on current unit costs and standard formulae from the Inventory Manual for Municipal Roads, 1991.
- Develop/review recommendations for improvement and associated costing on deficient assets.
- Develop recommendations for annual budgets based on current costs for Long Term Sustainability and major program areas based on updated unit costs.
- Develop analysis on the effect of current and recommended budgets on overall system performance.
- Develop a 10 year work plan.
- Provide Asset Management Strategy recommendations
- Provide the answers to the basic asset management questions;
    - What you have?
    - Where it's located?
    - What condition is it in?
    - What is it worth?
    - What will it cost to replace it?
    - Useful remaining life?
    - What service level will be required over the service life?
- A report on the foregoing.
- An updated geodatabase.

The 2023 State of the Infrastructure Report summarizes the road system survey conducted during the spring and summer of 2023. Gravel Roads were not reviewed during the spring breakup period. The database identifies the condition of each road asset by its time of need and recommended maintenance, rehabilitation or reconstruction treatment.

Recommendations are made based on the defects observed and other information available in the database at the time of preparation of the report. Once a road asset reaches the project level, the municipality may have selected another alternative based on additional information, asset management strategy, development considerations or available funding.

The report provides an overview of the physical and financial needs of the road system in its entirety, as well as by road section. Both information sources are used to develop programming and budgets. However, once a road section reaches the project design stage, further detailed review, investigation, and design will be required to address the specific requirements of each project.

Niagara-on-the-Lake provided updated information with respect to their database/network, which included sections that had been added or removed from the system, and other segment data.

The Inventory Manual methodology is discussed further in Section 3 of this report and Appendix A.

3 Asset Condition Rating Methodology

3.1 Asset Management Planning for Municipal Assets - Regulation 588/17 Requirements

Regulation 588/17, Asset Management Planning for Municipal, Infrastructure requires;

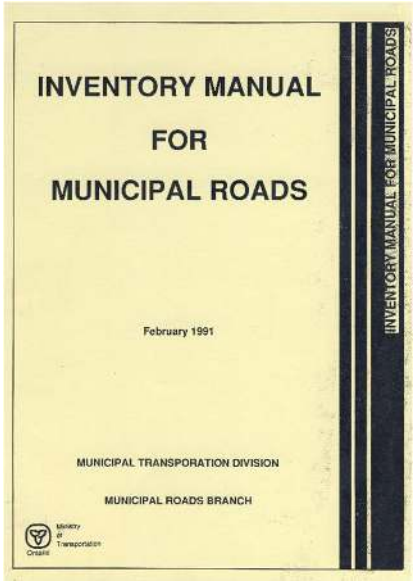
> *'v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate*.'

3.2 Asset Condition Rating Methodology

As an asset management practice Niagara-on-the-Lake is updating the condition and attribute information for the road system. This ensures that pavement management decision making is based upon current data from field survey information and is completed in accordance with standard engineering practice. The road section reviews follow the methodology of the Ministry of Transportation Inventory Manual for Municipal Roads, 1991.

3.2.1 Inventory Manual History

From the 1960's until the mid 1990's, the Ministry of Transportation (MTO) required municipalities to regularly update the condition ratings of their road systems in a number of key areas. The process was originally created by the MTO, as a means to distribute conditional funding, on an equitable basis, between municipalities. The reports were referred to as a 'Road Needs Study' (RNS) and were required in order to receive a conditional grant to subsidize the municipal road programs. After the introduction in the 1960's by the MTO, the methodology evolved into the current format by the late 1970's. The most current version of the Inventory Manual is dated 1991, and is the methodology used for this report. The practice was discontinued by a number of municipalities, when conditional funding for roads was eliminated in the mid 1990's.



3.2.2 Inventory Manual Overview

The Inventory Manual Methodology is a sound, consistent, asset management practice that still works well today, and in view of the increasing demands on efficiency and asset management, represents a sound asset management practice that should be repeated on a cyclical basis. The road section review identifies the condition of each road asset by its time of need and recommended rehabilitation strategy.

Niagara-on-the-Lake SotI & AMP Report summarizes the road system survey conducted during the late spring and early summer of 2023. The SotI Report provides an overview of the overall condition of the road system by road section, including such factors as structural adequacy, drainage, and surface condition. The study also provides an indication of potential deficiencies in the horizontal and vertical alignment elements, as per the Ministry of Transportation's manual, "Geometric Design Standards for Ontario Highways".

The report provides an overview of the physical and financial needs of the road system, which may be used for programming and budgeting. However, once a road section reaches the project design stage, further detailed review, investigation, and design will be required to address the specific requirements of the project.

Asset Management, by its' very nature, is holistic. Managing a road network based solely on pavement condition would be critically deficient in scope in terms of the information required to make an informed decision as to the improvements required on a road section.

The *Inventory Manual* offers a holistic review of each road section, developing a Time of Need (TON) or an Adequate rating in six areas that are critical to municipal decision making:

- Geometrics
- Surface Type
- Surface Width
- Capacity
- Structural Adequacy
- Drainage

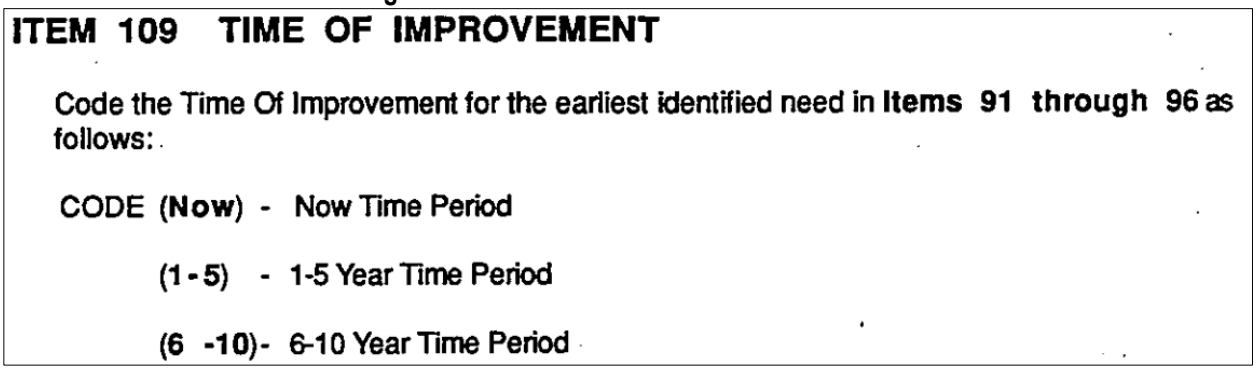
Evaluations of each road section were completed generally in accordance with the MTO's *Inventory Manual for Municipal Roads* (1991). Data collected was entered directly into WorkTech's Asset Foundation software. Condition ratings, Time of Need, Priority Ratings, and associated costs were then calculated by the software, in accordance with the *Inventory Manual*. Unit costs for construction were provided by Niagara-on-the-Lake staff.

Road sections should be reasonably consistent throughout their length, according to roadside environment, surface type, condition, cross section, speed limit, or a combination of these factors. As an example, section changes should occur as surface type, surface condition, cross-section, or speed limit changes.

The Condition Ratings, developed through the scoring in the *Inventory Manual*, classify roads as 'NOW', '1 to 5', or '6 to 10' year needs for reconstruction. The Time of Need is a prediction of the time until the road requires reconstruction, ***not the time frame until action is required***. For example, a road may be categorized as a '6 to 10' year need with a resurfacing recommendation. This road should be resurfaced as soon as possible, to further defer the need to reconstruct.

A Time of Need may exist in multiple of the six areas as shown above. The Inventory Manual categorizes the overall Time of Need by the 'worst case'.

Figure 3.1: Overall Time of Need Identification



ITEM 109 TIME OF IMPROVEMENT

Code the Time Of Improvement for the earliest identified need in **Items 91 through 96** as follows:

CODE **(Now)** - Now Time Period

(1-5) - 1-5 Year Time Period

(6 -10)- 6-10 Year Time Period

Field data is obtained through a visual examination of the road system and includes: structural adequacy, level of service, maintenance demand, horizontal and vertical alignment, surface and shoulder width, surface condition, and drainage. The Condition Rating is calculated based upon a combination of other calculations and data.

To best utilize the database information and modern asset management concepts, it has to be understood that the Time of Need (TON) ratings are the estimated time before the road would require reconstruction. NOW needs are still roads that require reconstruction; however, it is not intended that '1 to 5' and '6 to 10' year needs are to be acted on

in that timeframe. The '1 to 5' and '6 to 10' year needs are current candidates for resurfacing treatments that will elevate their structural status to 'ADEQ', and offer the greatest return on investment for a road authority (notwithstanding a drainage or capacity need, etc.).

The Time of Need ratings from the Structural Adequacy perspective are described more fully in Appendix A.

3.2.3 Inventory Manual Overview -Gravel Road Inspections

Item 87 – Structural Adequacy provides the following direction on the evaluation of gravel roads;

"Loose Top Sections

Appraise each section on the basis of two conditions during the spring

(a) SOFT SPOTS, as indicated by rutting and Frost Boils
(b) FROST BOILS only.

Table 3.1: Inventory Manual Table 87

Point Rating	Proportion of Section Length Exhibiting Soft Spots (Include the length of Frost Bolls)	Proportion of Section Length Exhibiting Frost Boils (Exclude the Length of Soft Spots which do not Boil)
20	Less than 5%	No Boils
19 to 15	5%-15%	Less than 5%
14 to 12	16%-20%	6%-10%
11 to 8	21%-25%	11%-15%
7 to 1	More than 25%	More than 15%

The gravel roads inspections were not undertaken during the spring breakup.

3.3 Improvement Recommendations

Improvement recommendations are predicated upon the field observations and ratings, dimensional data collected, and traffic information. As a project advances, further design, traffic and geotechnical studies should be undertaken to confirm the nature and extent of the improvement required.

Improvement recommendations are provided to correct the observed deficiencies. The road agency may elect to utilize a holding strategy as an interim measure due to budget constraints or other programming that has been prioritized.

During the course of the preparation of the work plan, some recommendations were changed to align with the Municipality's improvements that are in part being driven by other assets or master plans.

All BS - Base and Surface Improvement types- include costing for conversion to a hardtop road on gravel sections with an AADT greater than 50 for this study.

3.3.1 Improvement Recommendations and Road System Management

As indicated in section 3.3, improvement recommendations are predicated upon the field observations and ratings, dimensional data collected, and traffic information and are intended to correct ***all*** identified defects. The purpose of this is to provide the agency with observations/ratings and recommendations in their entirety in order that the road owner be fully aware.

Being fully aware is critical to move forward with effective management. It is the test that will be applied in the event of litigation; were you aware and what steps were taken once you became aware.

Managing the recommendations may be quite different than the recommendation to correct all deficiencies, but steps may be taken to reduce any municipality's exposure. (4 Roads is not qualified to provide legal advice; this issue should be discussed further with the municipality's own legal council.)

As an example, the Chatauqua Park area has a number of streets that are identified as 'NOW' needs, as the road width is narrower than the standard, and are also 6 to 10 year needs for drainage. Overall then, those sections would be 'NOW' needs. The pavements are on reasonably good condition for the most part.

Reconstruction of the roads, including storm drainage (RSS improvement) is the recommendation, as that would correct all deficiencies. In that area, reconstruction may not be practical due to road allowance limitations and proximity of significant vegetation and structures. As an interim solution then, the narrow roads should be identified through advisory signage. This would provide a response to being aware of the width deficiency.

Further information on improvement recommendation(s) and Time of Need may be found in the Inventory Manual Section D, Items 81-89, Section E Items 91-96 and, Section F.

3.3.2 Defects and Quality Assurance

As with the production of any product, the goal is to minimize defects to the greatest extent possible.

Quality Control is the system or process that the supplier undertakes to ensure that the product is provided as specified.

Quality Assurance is the system or process that the receiver of the product employs to assure themselves that the product that it is receiving, is in fact what was specified.

There is an associated cost with quality assurance, but that far outweighs the life cycle cost of receiving product that does not meet standard. *'You get what you inspect – not what you expect.'*

Defects are discussed in greater detail in Appendix B.

3.3.3 Defects Observed During Field Data Collection

During the course of the field reviews a number of defects were noted, as follows;

- **Thin lifts of pavements** were noted on existing and development road sections. This will introduce all lifecycle costs earlier in the asset life than typically anticipated, increasing annualized costs to sustain the system.

  This could be a function of the specifications at the time the road was constructed, or lack of control during the construction process.

Figure 3.2: Thin Lift Pavements

- **Ravelling / Aggregate Loss** was noted on a number sections. Typically, a microsurfacing recommendation was specified as a correction /holding treatment.

  Ravelling may be a function of the mix design, the as placed mixture (i.e., AC Content) or aggregate properties.

Figure 3.3: Ravelling / Aggregate Loss

- **Fatigue Cracking** and apparent premature failure of a number of sections i.e., evidence of fatigue/structural failure and no or few transverse thermal cracks occuring. The absence of thermal cracking would be indicative of a relatively new pavement, typically less than 5 or 6 years old.

  There could be a number of potential causes for the premature failure including insufficient structural design, resurfacing an existing pavement that has not been adequately prepared, difference in the actual vs estimated truck traffic.

Figure 3.4: Fatigue Cracking

- **Platform and surface widths** can vary through rural or semi urban cross sections.
- **Thin Lift Gravel Resurfacing**

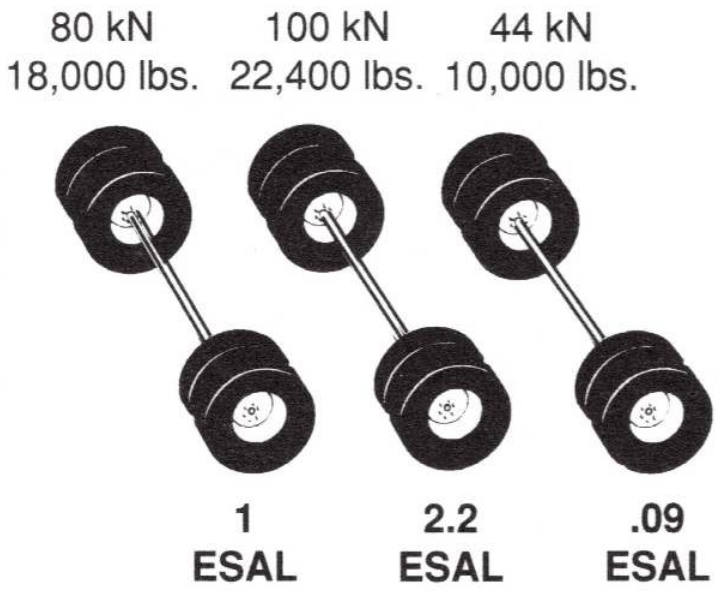
Figure 3.5: Thin Lift Gravel Overlay

The observation of thin lift gravel resurfacing is supported by the budget information provided. The current funding level is sufficient to add 75mm (3 inches) of gravel approximately every 20 years.

3.3.4 Traffic Impact on Improvement Recommendations

Improvement recommendations are predicated on a number of factors and in terms of structural design, heavily predicated on traffic, and particularly heavy commercial traffic and buses. The number and type of heavy vehicles is critical to pavement design and ultimately, its' performance. Under-designed pavement will not perform as expected.

Figure 3.6: ESAL Comparison from Asphalt Institute Thickness Design Manual



When designing a road, the traffic loading from different vehicles has to be converted to, and expressed in, common terms. In Ontario (and across North America) Equivalent Single Axle Loads (ESAL's) are used to design pavement structure and the determine the required consensus properties of materials.

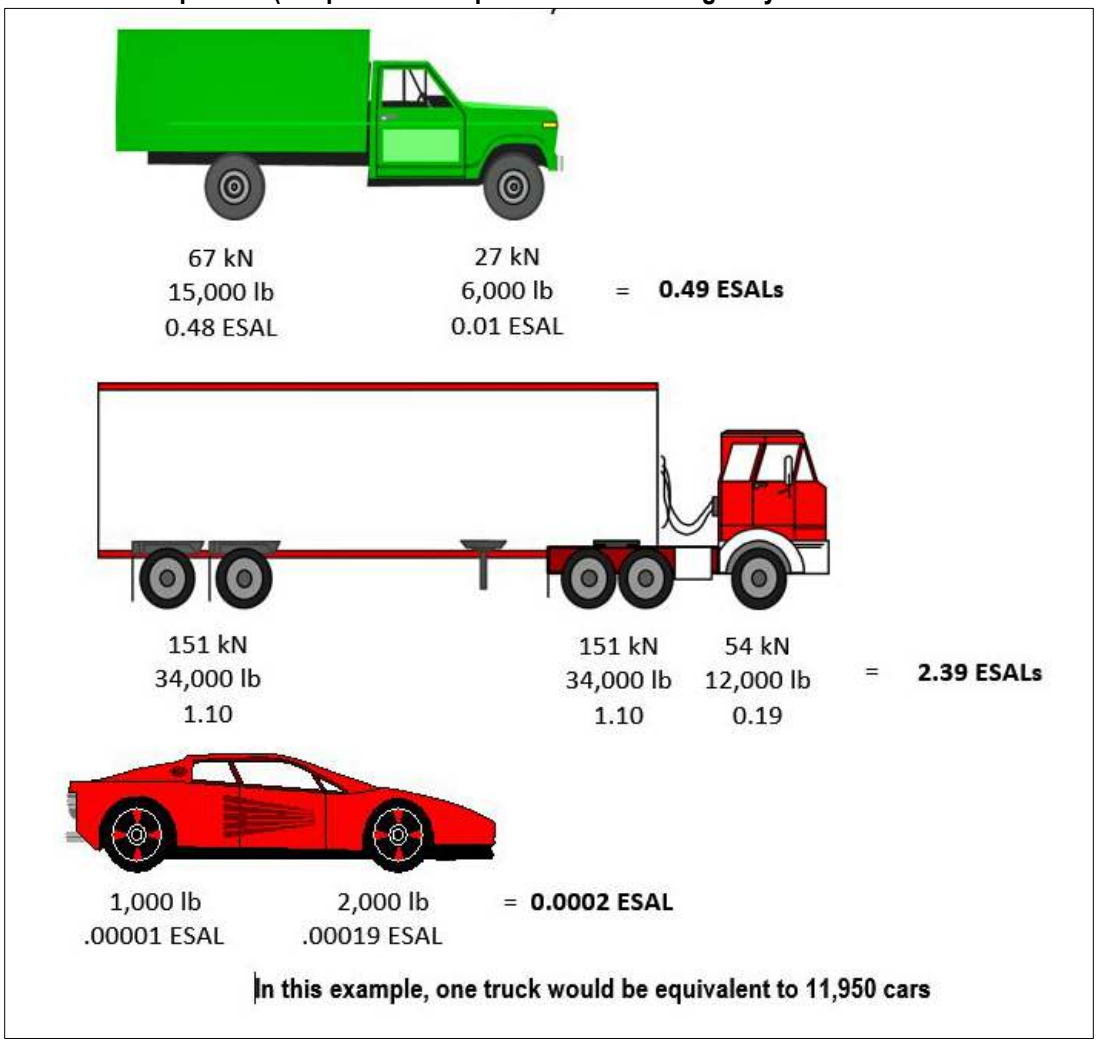
The ESAL measurement has been in use for a significant length of time and has its roots in the older Imperial or Standard measures. The metric system was adopted in Canada in 1977. One ESAL is 18,000 lbs, 18kips or 80 Kilonewtons. In Ontario the maximum load for a single axle is 10 tonnes, which equals 100 Kilonewtons, or 2.2 ESAL's.

The American Association of State Highway and Transportation Officials (AASHTO) and the Asphalt Institute (AI) are often cited references for pavement design. The formula to determine load equivalencies is very complex, however, at a high level, a simplified formula may be used to approximate the load equivalency factor. This formula is sometimes referred to as the Fourth Power Law or the Generalized Fourth Power Law. The Load Equivalency Factor may be used to illustrate the relative difference in damage between particular loadings.

Equation 3-1: Load Equivalency Factor

$$\text{Load Equivalency Factor} = \left[\frac{\text{Specific Axle Load}}{18{,}000 \text{ lbs}} \right]^4$$

Figure 3.7: ESAL Comparison (Adapted from Asphalt Institute for Highway and Street Rehabilitation Manual)



3.3.1 Traffic Counts

Section 2.3.2 identifies the impact of traffic, *particularly trucks*, on the performance of the roads and the inherently greater pavement structure that is required to carry said traffic. This reinforces the need to have current traffic information that would include the type and number of vehicles that are using the road in order that an appropriate pavement structure may be determined.

NotL has a regular traffic counting program that should be continued and include the percentage of trucks, count year, and the type of count - actual or estimated. The importance of traffic counts is also discussed in Section 3.2.2.

The changes in traffic patterns resultant from the pandemic may skew the traffic counts downward causing an inaccurate determination of the O.Reg 239/02 classification, which would pose a potential liability for the municipality.

3.3.2 Seasonal Half Load Restrictions

The discussion in the Section 2.3.2 identifies the effect the heavy vehicles have on a pavement structure. During the spring break-up season- typically March 1 to April 30- frost is coming out of the ground which reduces the ability of the road structure to carry loads.

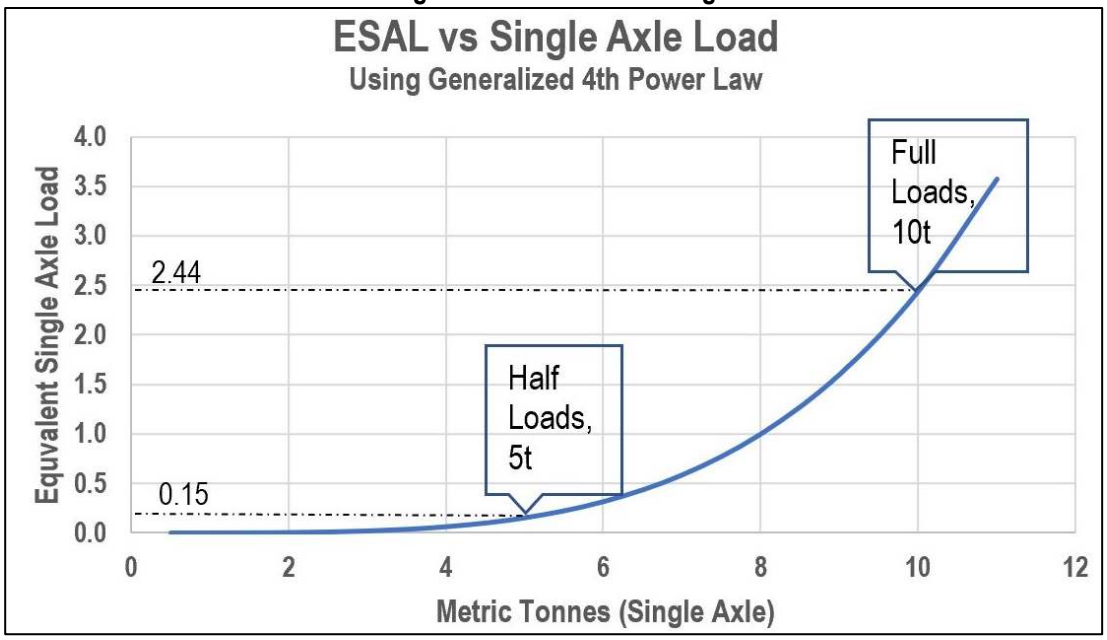
From the paper entitled 'Proposed System for Co-ordinating Spring Load Restrictions in Ontario' presented at the 2013 Transportation Association of Canada Conference, the following provides an easily understood explanation for the need for half load restrictions ;

> *Roads and highways in northern climates are affected by seasonal growth and melting of ice beneath the surface, especially on roads with a non-engineered base beneath the driving surface. Ice growth can be advantageous by increasing the bearing strength of road materials, or disruptive where moisture accumulates locally in frost heaves or boils. Melting of ice can lead to weakening of road materials where melt near the surface is more rapid than at depth, and excess moisture is trapped above a non-permeable subsurface layer, leading to rutting and pavement cracking.*
>
> *The effects of freezing and thawing of low volume roads in Ontario is mitigated through temporary Winter Weight Premiums (WWP) during the frozen season and Half Load Restrictions or Spring Load Restrictions (SLR) during the thaw season on designated road sections (Ontario, 2013). They are intended to provide a balance between the access needed by the trucking and resource industry and the added road repair and maintenance costs borne by the Ministry of Transportation or local municipalities.*

The Highway Traffic Act Section 122 provides authority to a municipality to impose load restrictions. The timing of the imposition of spring load restrictions should be based on the conditions, not just the date. Climate change has introduced significant variability into the commencement the spring thaw, and as such, there should be delegated authority to staff to impose the restrictions as conditions occur.

Half Load Restrictions should commence as determined by the conditions and/or the date. The Good Roads Association now has software available to make this determination.

Figure 3.8: Effect of Loading



3.4 Types of Improvements

This report identifies ratings that are resultant from identification of deficiencies on each road section that equate to a TON in one or more of the six critical areas: Geometry, Surface Type, Surface Width, Capacity, Structural Adequacy, or Drainage. Based on the ratings and the deficiencies noted an improvement type recommendation is also provided.

The key factor in providing an improvement type recommendation is the visual survey. During the visual survey, a determination is made as to whether the appearance and performance of a road relates to an underlying structural problem, or simply to aged surface materials. A road's structural or drainage problem would tend to result in a reconstruction/ replacement treatment recommendation, whereas aged surface materials would result in a resurfacing/rehabilitation treatment recommendation. A determination of the root cause of the problem or the condition is critical; reconstructing a road that should have had some type of resurfacing treatment would be an ineffective use of available resources.

For the purposes of this report, the standard improvement types and associated costing formulae identified in the Inventory Manual have been used where applicable. Other improvement types have been developed to more fully evolve the development of a more holistic work plan that includes capital and major maintenance activities

The following table provides a list of road improvements used for the development of this report.

Appendix B of this report includes a discussion of pavement structure and defects.

Table 3.2: Average Improvement Costs per Kilometre by Improvement Type

Improvement Class	Improvement ID / Description		Average Cost /km $	Rural Average	Semi Urban Average	Urban Average
Const	BS	Base and Surface	697,681	704,914	593,177	NA
Const	NONE	No Improvement Required				
Const	REC	Reconstruction - Rural	1,134,189	1,217,364	1,028,998	NA
Const	RMrural	Major Resurfacing-Rural	522,581	NA	522,581	
Const	RNS	Reconstruction Nominal Storm Sewer	1,115,287	NA	1,115,287	
Const	RSS	Reconstruction with Storm Sewers	3,178,897	NA	3,178,897	
Const	RW	Resurface and Widen	425,691	NA	340,439	1,195,219
Const	SRR	Storm Sewer and Road Reinstatement	1,759,141	NA	1,759,141	
Maint	CRK	Crack Sealing	2,570	2,570	2,571	2,570
Maint	CRKsd	Crack Sealing and Spot Drainage	14,870	NA	14,870	NA
Maint	MICRO	Microsurfacing	48,581	NA	35,752	49,153
Maint	SD	Spot Drainage	16,553	16,623	16,400	16,403
Maint	SR	Spot Repairs				
Rehab	DSTrehab	Double Surface Treatment Rehabilitation	210,465	210,465	NA	NA
Rehab	PR2	Pulverize and Resurface 2 - 100mm	305,335	306,010	279,587	NA
Rehab	R1	Basic Resurfacing 1 - 50mm	249,344	149,233	132,339	464,434
Rehab	R2	Basic Resurfacing 2 - 100mm				
Rehab	SST++	SST, 10% Base Repairs, Minor Ditching				
Rehab	SST+	Single Surface Treatment and Minor Ditching				
Rehab	SST	Single Surface Treatment				

Table 3.3: Road Improvement Types

Inventory Manual Improvements or Modified Inventory Manual Improvements	
Code	**Description**
R1	Basic Resurfacing, Basic Resurfacing
R2, MSR, MUR	Basic Resurfacing – Double Lift,
RM, RMrural	Major Resurfacing – removes existing asphalt and replace with existing plus and additional lift.
PR1	Pulverizing and Resurfacing
PR2, PR3	Pulverizing and Resurfacing – Double Lift or Triple Lift
BS	Tolerable standard for lower volume roads: – Rural and Semi-Urban Cross sections only. Improves drainage and adds structure (granular base) and a surface but not to a reconstruct standard. Typically specified where width is to an acceptable standard.
RW	Resurface and Widen- adds additional lanes and resurfaces the entire road
REC	Reconstruction
RNS,	Urban Reconstruction with Nominal Sewers
RSS,	Urban Reconstruction with Storm Sewers
NC	Proposed Road Construction
SRR	Storm Sewer Installation and Road Reinstatement
SR	Spot Road Improvement
SD	Spot Drainage
CO	Carry Over project
Additional Treatments	
CRK	Crack sealing
SDcrk	Crack Sealing and Spot Drainage
DST	Double Surface Treatment
DSTrehab	Pulverize and existing surface treated road, add 150mm of gravel, double surface treat, and spot drainage improvements. Typically specified where the road appears to be structurally sound but the surface treatment is deteriorated beyond the point where it should not be re surface treated.
DSTrehab2	As DSTrehab, substituting 150mm of gravel,
GRR	Gravel road resurfacing 75mm
GRRsd	Gravel road resurfacing 75mm and spot drainage
GRR2	Gravel road resurfacing 150mm
GRRsd	Gravel road resurfacing 150mm and Spot Drainage
MICRO	Microsurfacing
SST	Single Surface Treatment
SSTsd	Single Surface Treatment and minor ditching
SSTsd-base	Single Surface Treatment, 10% base repairs and minor ditching

3.4.1 Improvement Recommendations and Costing

The bench mark improvements from the Inventory Manual represent a sound methodology for developing a project cost. In the absence of any municipality specific formulae, the bench mark costs work well to produce a representative cost to undertake a specified improvement.

In the bench mark costing, there are four cost factors that are added to the material and placement costs of a project;

- Basic Construction Factor
- Engineering Factor
- Contingency Factor and,
- Terrain and Soil Type Factor

Appendix A includes fuller descriptions of each of the above noted improvements.

Appendix B of this report includes a discussion of Pavement Structure and defects.

4 State of the Infrastructure

4.1 Scope / Asset Type(s)

This report addresses road assets only. The content will provide review and analysis of the road system from a number of perspectives including condition rating, functional classification, roadside environment, replacement cost, Regulation 239/02 classification and Regulation 588/17 Classification.

The cost of storm sewers is included in the replacement / improvement recommendation RSS - Reconstruct with storm sewers.

4.2 Road Asset Inventory and Classification

Assets are classified by different measures dependent upon regulation and end usage of the information. The following sections of the report define the road assets by a number of parameters including road surface type, roadside environment, and Regulations 239/02 and 588/17.

For performance modeling purposes, 4 Roads has created asset classes that are defined by surface type, roadside environment and traffic. Appendix C of this report provides further discussion on asset classes for performance modeling.

4.2.1 Surface Types and Roadside Environment

Roadside environment and surface type criteria of a road section are useful in characterization of the road section, and in determining costs for replacement, reconstruction and rehabilitation treatments.

The *Inventory Manual* classifies the roadside environment as Rural, Semi-Urban or Urban. The classification is determined by length, servicing, and adjacent land use.

- ***Rural Roads*** – within areas of sparse development, or where development is less than 50% of the frontage, including developed areas extending less than 300 m on one side or 200 m on both sides, with no curbs and gutters.
- ***Semi-Urban Roads*** – within areas where development exceeds 50% of the frontage for a minimum of 300 m on one side, or 200 m on both sides, with no curbs and gutters, with or without storm/combination sewers, or for subdivisions where the lot frontages are 30 m or greater.
- ***Urban Roads*** – within areas where there are curbs and gutters on both sides, served with storm or combination sewers, or curb and gutter on one side, served with storm or combination sewers, or reversed paved shoulders with, or served by, storm or combination sewers, or for subdivisions with frontages less than 30 m.

Table 4.1: Surface Type and Roadside Environment Distribution

Material Description	Roadside Environment						TOTAL		% OF TOTAL	
	Rural		Semi Urban		Urban					
	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km	CL-km	Lane-km
Earth	16.723	33.446	0	0	0	0	**16.723**	**33.446**	6.46%	6.45%
Gravel, Stone, Other Loosetop	14.7	29.4	0.192	0.384	0	0	**14.892**	**29.784**	5.76%	5.74%
High Class Bit.-asphalt	39.026	78.052	27.02	54.193	55.327	111.659	**121.373**	**243.904**	46.92%	47.03%
Low Class Bit.-surface treated	95.739	191.478	9.708	19.416	0.271	0.542	**105.718**	**211.436**	40.86%	40.77%
TOTAL	**166.188**	**332.376**	**36.92**	**73.993**	**55.598**	**112.201**	**258.706**	**518.57**		
% OF TOTAL	64.24%	64.09%	14.27%	14.27%	21.49%	21.64%				

4.2.2 Ontario Regulation 239/02 Classification- Minimum Maintenance Standards for Municipal Highways

In the 1990's, municipalities experienced an escalation of claims and resultant awards for damages which in turn increased the cost of municipal insurance. Increased insurance costs typically resulted in a reduction of available funding for the provision of services as municipalities strove to keep annual tax increases to a minimum.

A draft regulation was created and circulated to municipal stakeholders and agencies for comment over a period of years, starting in the late 1990's. The premise being that, this would represent a standard for maintenance for municipalities that – if met - and documented- would provide the municipalities with a level of defense in claim. (Reference the Ontario Municipal Act) The consultative process occurred over a lengthy period of time.

In November 2002, Ontario Regulation 239/02 (O.Reg 239/02), Minimum Maintenance Standards for Municipal Highways (MMS) came into effect. Essentially, if a municipality met the standard and documented it, they would not be negligent per Section 44(3)c of the Municipal Act noted above.

O.Reg 239/02 created 6 classifications for roads based on AADT (traffic count) and speed limit. Table 3.2 shows O.Reg 239/02 traffic/speed/ classification matrix as amended by O.Reg 366/18.

Regulation 239/02 provided for a review five years after its original implementation. A process to revise Regulation 239/02, chaired by the Ontario Good Roads Association (OGRA now Good Roads), culminated in a revised regulation, Regulation 23/10, coming into effect in February 2010.

In the late fall of 2011, a court decision (Giuliani) was rendered that effectively created case law that negated the protection that the MMS afforded, and in particular, Tables 4 and 5 of the regulation (Tables 4 and 5 addressed Snow Accumulation and Icy Roads in that revision of the MMS). Essentially, the decision created a new standard that went beyond the original MMS. The effect on a municipality is that a higher standard of weather monitoring, documentation and proactive response (as opposed to reactive) to monitoring would be required, particularly in the case of ice formation prevention (anti icing).

OGRA re-called the MMS committee to further amend the regulation, to address the outcome of the Giuliani decision. As a result of the committee meetings and discussions with the province, Regulation 47/13 came into effect, amending Regulations 239/02 and 23/10, on January 25 2013.

As noted, Regulation 239/02 provides for review at 5 year intervals. Effective May 3, 2018, the next revision of the regulation came into effect (O.Reg 366/18). There are a number of revisions in the updated regulation that affected the MMS classifications and also modified and added a number of service delivery standards for bike lanes and sidewalks.

Table 4.2: O.Reg 239/02, as amended by O.Reg 366/18, Minimum Maintenance Standard Road Classification

Column 1 Average Daily Traffic (number of motor vehicles)	Column 2 91 - 100 km/h speed limit	Column 3 81 - 90 km/h speed limit	Column 4 71 - 80 km/h speed limit	Column 5 61 - 70 km/h speed limit	Column 6 51 - 60 km/h speed limit	Column 7 41 - 50 km/h speed limit	Column 8 1 - 40 km/h speed limit
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

The Minimum Maintenance Standards do not have to be adopted by a municipal council per se. The regulation is provincial, applies to all municipalities, and is available for municipalities to use as a defense if they have met the standard and documented it. The more important issue would be to ensure that a municipality has the appropriate Standard Operating Procedures (SOP's) in place, and that they are followed and documented, rather than trying to reword or parallel the language of the regulation into a document that is agency specific. SOPs are a (management) staff created document that identifies service delivery processes to staff, and do not require Council approval. Policy is the purview of Council; SOPs are how staff deliver on the direction of the policy.

Traffic counts are important for a number of decision making purposes, with respect to the road system. Accurate, defensible traffic counts, in conjunction with the posted speed limits, are used in determining the MMS class of the respective road sections. Roads are divided into six service classes by posted speed and traffic count, with Class 1 being the highest service level and Class 6 being the lowest. There are no service standards for Class 6 roads which are low traffic volume and low speed as identified in Table 3.2

The caveat is that, whereas there are no service standards for Class 6 roads, *there are geometric design standards* for low volume roads that are still applicable for width, curves and other geometry. Road structure will be dependent on traffic type.

The regulation defines response time by MMS class and defect type. Response time is defined as the time from when the municipality becomes aware that a condition exists, until the time that the condition is corrected or brought within the limits specified in the regulation. For example, the response time that is required to remove snow accumulation is 12 hours for a Class 3 road, and 16 hours for a Class 4 road.

This may have a significant impact with respect to the equipment and staffing that may be required to meet the standard, particularly in the case of winter control. The implications are that this increased service level may require the municipality to increase the inspection frequency, staff, and machinery to deliver the service beyond the service delivery hours that may currently exist.

Traffic Counts are critical to the accurate classification of road sections and decision making for capital and operational programs. The Niagara-on-the-Lake records indicate the history of the traffic counting program as shown in Table 4.3 .

Table 4.3: Traffic Count History

Count Year	AADT Counted	AADT Estimated	TOTAL	% OF TOTAL
2006	0.829	0	**0.829**	0.32%
2011	0.638	0.918	**1.556**	0.60%
2012	1.144	0	**1.144**	0.44%
2013	0	0.804	**0.804**	0.31%
2014	0.82	0.094	**0.914**	0.35%
2015	14.504	1.069	**15.573**	5.96%
2016	7.409	0	**7.409**	2.84%
2017	1.863	0	**1.863**	0.71%
2018	11.656	0	**11.656**	4.46%
2019	0.101	0	**0.101**	0.04%
2020	9.49	0	**9.49**	3.63%
2021	1.021	0	**1.021**	0.39%
2023	53.042	155.701	**208.743**	79.95%
TOTAL	**102.517**	**158.586**	**261.103**	
% OF TOTAL	0.3926	0.6074		

Not adjusted for Boundary Roads

Niagara-on-the-Lake *did not* collect traffic data on the percentage and type of vehicles, but have been advised that the NotL processes has been revised to include that information going forward.

As noted earlier in the report, truck and other heavy traffic is the primary driver in the pavement structure design. The type of traffic should be included in the traffic count information.

The distribution of the MMS Classes across the Niagara-on-the-Lake road system is detailed in Table 4.4.

Table 4.4: Minimum Maintenance Standards Class Distribution

Roadside Environment	O.Reg 239/02 Classification 3		4		5		6		Totals		% of Totals	
	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km
Rural	42.228	84.456	79.873	159.746	17.336	34.672	29.148	58.296	168.585	337.17	64.57%	64.42%
Semi Urban	0.148	0.296	2.244	4.641	25.858	51.716	8.67	17.34	36.92	73.993	14.14%	14.14%
Urban	0.386	0.772	2.584	6.069	40.719	81.542	11.909	23.818	55.598	112.201	21.29%	21.44%
TOTAL	**42.762**	**85.524**	**84.701**	**170.456**	**83.913**	**167.93**	**49.727**	**99.454**	**261.103**	**523.364**		
% of Total	16.38%	16.34%	32.44%	32.57%	32.14%	32.09%	19.04%	19.00%				

Traffic information for this report was provided by Niagara-on-the-Lake *Adjusted for Boundary Roads

4.2.3 Functional / Existing / Design Classifications per the Inventory Manual for Municipal Roads

Roads are further classified within the database by classes such as Local, Collector, or Arterial and Residential or Industrial. Items 33 and 105 in the *Inventory Manual* provide further direction on determination of the Existing or Design Classes of road. Generally, the classifications are predicated on the existing use, roadside environment, and anticipated growth over either the ten- or twenty-year planning horizon.

The road sections are classified by the rater, at the time of the field review. Table 4.5 identifies the Functional Road Class Distribution.

Table 4.5: Functional Road Class Distribution (Inventory Manual)

Functional Classification	Lanes	Roadside Environment Rural		Semi Urban		Urban		TOTAL	
		Repl. Cost	Length (km)	Repl. Cost	Length (km)	Repl. Cost	Length (km)	Repl. Cost	Length (km)
100	2	9,665,957	25.678	0	0.000	0	0.000	**9,665,957**	**25.678**
200	2	22,259,655	22.045	0	0.000	0	0.000	**22,259,655**	**22.045**
300	2	25,917,588	26.493	0	0.000	0	0.000	**25,917,588**	**26.493**
400	2	61,958,209	44.875	0	0.000	0	0.000	**61,958,209**	**44.875**
500	2	54,105,103	35.063	0	0.000	0	0.000	**54,105,103**	**35.063**
600	2	15,664,336	8.185	0	0.000	0	0.000	**15,664,336**	**8.185**
700	2	9,169,721	4.709	0	0.000	0	0.000	**9,169,721**	**4.709**
800	2	3,297,936	1.643	0	0.000	0	0.000	**3,297,936**	**1.643**
C/R	2	0	0.000	3,090,509	2.239	4,985,168	1.912	**8,075,677**	**4.151**
C/R	3	0	0.000	345,388	0.153	1,224,875	0.304	**1,570,263**	**0.457**
CCI	2	0	0.000	0	0.000	572,998	0.152	**572,998**	**0.152**
CCI	3	0	0.000	0	0.000	2,772,342	0.597	**2,772,342**	**0.597**
L/R	1	0	0.000	0	0.000	272,978	0.097	**272,978**	**0.097**
L/R	2	0	0.000	34,808,785	33.292	162,891,210	51.058	**197,699,995**	**84.350**
L/R	3	0	0.000	0	0.000	750,792	0.201	**750,792**	**0.201**
LCI	2	0	0.000	1,633,282	1.284	4,189,766	1.277	**5,823,048**	**2.561**
TOTAL		**202,038,505**	**168.691**	**39,877,964**	**36.968**	**177,660,129**	**55.598**	**419,576,598**	**261.257**
% OF TOTAL		48.15%	64.57%	9.50%	14.15%	42.34%	21.28%		

4.2.4 O. Reg 588/17 Classification – Asset Management Planning for Municipal Infrastructure

Regulation 588/17, Asset Management Planning for Municipal Infrastructure was enacted on December 27, 2017. In part the regulation provides for another functional classification of road sections within a system. The classification takes a broader brush than the Inventory Manual, classifying road sections as Arterial, Collector, or Local, based directly on the Regulation 239/02 road classification.

Class 1 and 2 are Arterial; Class 3 and 4 are Collector; Class 5 and 6 are Local.

Table 4.6 identifies Regulation 588/17 Classification. For the purposes of this report, 4 Roads has aligned the urban and semi urban functional classifications with O.Reg 588/17. Urban and Semi-urban road sections have been classified in accordance with this table.

Table 4.6: Ontario Regulation 588/17 Functional Road Classification

O.Reg 588/17 Classification	Roadside Environment						Totals		% of Totals	
	Rural		Semi Urban		Urban					
	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km	Cl km	Lane km
Collector	122.101	244.202	2.392	4.937	2.97	6.841	**127.463**	**255.98**	48.82%	48.91%
Local	46.484	92.968	34.528	69.056	52.628	105.36	**133.64**	**267.384**	51.18%	51.09%
TOTAL	**168.585**	**337.17**	**36.92**	**73.993**	**55.598**	**112.201**	**261.103**	**523.364**		
% of Total	64.57%	64.42%	14.14%	14.14%	21.29%	21.44%				

4.3 Horizontal and Vertical Alignment

The changes in direction and elevation of the road are referred to as the horizontal and vertical alignment. The changes in direction should be designed and constructed such that the posted speed limit of the road section may be safely maintained throughout the section. If maintaining the posted speed safely cannot be achieved, then the horizontal or vertical curve would be identified as substandard.

Lower volume roads that have not been reconstructed, tend to closely follow (or avoid) the existing contours of the land. In southern Ontario, which is relatively flat, there was a greater tendency to follow the alignments of the original Township surveys. However, where these roads were adjacent to larger streams and rivers, there was still a tendency to follow the topography. The result was/is a road alignment that tends to change vertical and horizontal direction frequently; at times without much notice.

When a new road is designed, one of the considerations is the Safe Stopping Distance (SSD). The calculation of the distance to stop safely from any given speed is based upon several factors, such as posted speed limit, reaction times, and friction. When road sections are evaluated for a State of the Infrastructure report, the number of vertical and horizontal curves that appear to be deficient are identified. The identification is based on whether there is sufficient SSD for the posted speed limit. The following table is an excerpt from the Geometric Design Standards for Ontario Highways, and indicates the SSD's required for various design speeds.

Figure 4.1: Safe Stopping Distance

Table C2-1
MINIMUM STOPPING SIGHT DISTANCE ON WET PAVEMENTS

Speed *v*		Perception and Brake Reaction		Coefficient of friction wet pav't	Braking distance on level	S-Min. Stopping sight distance	
Design	Assumed condition	Time	Distance			calculated	rounded
km/h	km/h	s	m	*f*	m	m	m
40	40	2.5	28	0.380	17	45	45
50	50	2.5	35	0.358	27	62	65
60	60	2.5	42	0.337	42	84	85
70	70	2.5	49	0.323	60	109	110
80	79	2.5	55	0.312	79	134	135
90	87	2.5	60	0.304	98	158	160
100	95	2.5	66	0.296	120	186	185
110	102	2.5	71	0.290	141	212	215
120	109	2.5	76	0.283	165	241	245
130*	116	2.5	81	0.279	190	271	275
140*	122	2.5	85	0.277	211	296	300
150*	127	2.5	88	0.273	232	320	320
160*	131	2.5	91	0.269	251	342	345

**Design Speeds above 120 km/h are beyond the normal range of application*

On rural roads, one of the effects of substandard alignments is a decrease in the Average Operating Speed through the road section. An Average Operating Speed that is significantly lower than the posted speed will result in a Geometric Need for the road section. The following table from the *Inventory Manual* identifies the limits that will trigger a geometric need for typical posted speed limits.

Table 4.7: Posted Speed vs. Minimum Tolerable Operating Speed

Item	Speed					
Legal Speed Limit	40	50	60	70	80	90
Minimum Tolerable Operating Speed	35	45	50	60	65	75

The following pictures were not taken in Niagara-on-the-Lake, but provide examples of potentially substandard alignments.

Figure 4.2: Potentially Substandard Vertical and Horizontal Alignment

Photos not from Niagara-on-the-Lake

Appendix H of this report includes a listing of potentially substandard vertical and horizontal alignment. These sections should be reviewed to ensure signage is compliant with the Ontario Traffic Manual(s)

4.4 Drainage

Adequate drainage is critical to the performance of a road to maximize the life expectancy. Roads are designed, constructed, and maintained in order to minimize the amount of water that may enter, or flow over, the road structure.

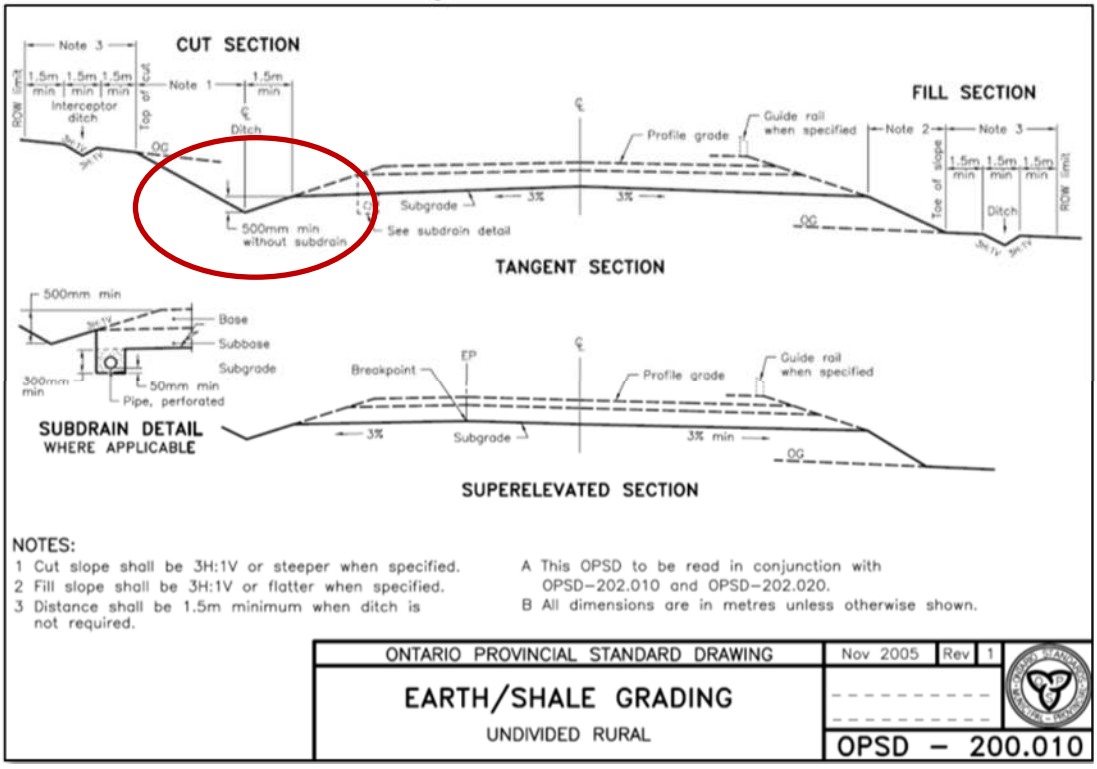
In the case of water flowing over the road, assessment must be made of the circumstances on a site-specific basis. Factors that should be considered include the traffic volumes of the road section, economic impacts to the loss of the use of the road, upgrade costs, and risks. In certain circumstances, water ponds or flows on the road by design, as part of the storm water management plan.

Water in a road base can cause different reactions at different times of the year. In non-freezing conditions, the granular road base can become saturated. Too much water displaces the granular material; it removes the material's ability to support the loads for which it was designed. Too much water in the granular material actually acts like a lubricant and facilitates the displacement of the material under load.

In freezing conditions, water in the road structure can cause frost heave, potholes, and pavement break-up as the water freezes and expands. Generally, a saturated granular road base results in structural failure of the road.

Figure 4.3 provides an example of a rural road, illustrating what the relationship between the gravel road base and the drainage should be. The relationship is the same in an urban system, although not as obvious. Rural road drainage is typically achieved through roadside ditches. Rural road ditches should be a minimum of 500 mm below the granular road base, to ensure that the road base remains free from moisture and maintains its ability to support loads.

Figure 4.3: OPSS 200.10



Urban roads typically have a storm sewer pipe network that carries the minor storm event. The roadway itself is often part of the overland flow route for the major event. The drainage of the granular road base is accomplished through sub-drains installed below the curb and gutter, lower than the lowest elevation of the granular base. This satisfies the same purpose as the ditch in a rural cross-section, by providing an outlet to ensure that the granular base remains dry.

Evaluations of the drainage scores were in part predicated upon the structural score. For example, where a road section had virtually no ditch, or very minimal ditching but the road structure did not show any signs of failure typically observed when there is inadequate drainage, then generally a rating was between 12 and 14 and an 'SD- (Spot drainage) improvement noted. Where it was obvious that the inadequate ditch was exacerbating the distress on the road or there was occasional flooding, the score would be further reduced and the improvement type would be some

type of major rehabilitation or reconstruction dependent upon the traffic volumes. Table 4.8 provides an overview of the drainage needs of the road system by Time of Need.

Table 4.8: Drainage by Time of Need

Roadside Environment	Time of Need				TOTAL	% OF TOTAL
	1 to 5	6 to 10	ADEQ	NOW		
Rural	13.245	60.225	92.718	0	**166.188**	64.24%
Semi Urban	2.802	24.116	10.002	0	**36.920**	14.27%
Urban	0.086	0.149	55.363	0	**55.598**	21.49%
TOTAL	**16.133**	**84.490**	**158.083**	**0**	**258.706**	
% OF TOTAL	6.24%	32.66%	61.11%	0%		

Table 4.9: Drainage by Roadside Environment and Drainage Type

Drainage Type	Roadside Environment			TOTAL	% OF TOTAL
	Rural	Semi Urban	Urban		
AS - Adjacent Road, storm sewer	0	0.289	0.131	**0.42**	0.16%
DS - Ditch and Storm Sewer	6.233	17.089	1.302	**24.624**	9.52%
N - None	2.156	8.193	0	**10.349**	4.00%
OD - Open Ditch	157.663	10.577	2.268	**170.508**	65.91%
SS - Storm Sewer	0.137	0.772	51.897	**52.806**	20.41%
TOTAL	**166.188**	**36.92**	**55.598**	**258.706**	
% OF TOTAL	64.24%	14.27%	21.49%		

Figure 4.4: Shoulder Berm

Maintenance of the drainage system(s) is critical to the long-term performance of a road system. Low volume rural roads tend to have a winter maintenance program that includes the application of sand to improve traction. Over time, that sand builds up on the edge of the pavement, to a point where it effectively blocks runoff from getting to the ditch. The runoff is trapped at the edge of pavement, where it saturates that area of the road bed, contributing to the early failure of the edge of the pavement or riding surface. This element of the road cross-section is not scored as

part of the overall evaluation. This is a maintenance issue, however, if roadside berms are not removed, the effect on the overall pavement is similar to not having a ditch. Water cannot drain from the road and it enters into the granular base potentially saturating it. The saturated base cannot support load.

4.4.1 Drainage Outlet and Master Planning

Correcting drainage issues is not quite as simple as digging a ditch or installing a storm sewer. In Ontario, Common law for drainage is such that water cannot simply be collected and directed. It has to be directed to a legal, adequate outlet. There are two primary methodologies to achieve the legal outlet; a Class Environmental Assessment Process or a petition for a Municipal Drain under the Drainage Act. The 'adequate' component is an engineering function/ assessment.

4.4.2 NotL Drainage Observations

A number of the older areas of NotL, and Queenston appear to have some potential drainage issues due to local topography, semi urban cross sections and potentially limited outlet.

As NOTL reconstructs/rehabilitates sections of the road network in the urban and semi urban areas, a Master Drainage Plan should be developed as part of a Class Environmental Assessment process prior to the reconstruction process occurring, in order that both minor and major storm events are dealt with appropriately

4.5 Width

O.Reg 239/02 indicates that class 6 (Low volume, low speed) roads do not have a response time for correction of maintenance deficiencies, all roads have geometric design standards.

The Inventory Manual indicates minimum tolerable standards for road widths and minimum tolerable standards for shoulder widths. Items 85 and 84 respectively. The minimum tolerable standards vary with traffic count and roadside environment. The listing of the narrow roads is in Appendix I.

Table 4.10: Road Width by Time of Need

Roadside Environment	Time of Need		TOTAL	% OF TOTAL
	ADEQ	NOW		
Rural	148.996	17.193	**166.188**	64.24%
Semi Urban	34.536	2.384	**36.92**	14.27%
Urban	55.501	0.097	**55.598**	21.49%
TOTAL	**239.033**	**19.674**	**258.706**	
% OF TOTAL	92.40%	7.60%		

The NotL database includes 16.723 km of 'Earth' surfaced roads which are mostly providing access to farmland, which includes 6.451km of NOW Need Width sections

The area near Chautauqua Park would be the majority of the residential roads that indicate a width need. Roads with substandard width should be reviewed for signage as an interim measure. Discussed earlier in the report, Section 3.

4.6 Capacity

Item 94 of the Inventory Manual provides an assessment as to the adequacy of the capacity of the road section based on number of lanes, roadside environment, AADT and percentage of commercial vehicles. Further detail may be found in Appendices C and D of the Inventory Manual.

It is a simple calculation and should be as more of a trigger for further investigation as to the need for additional lanes on a road section.

Table 4.11: Capacity by Time of Need

Roadside Environment	Time of Need				TOTAL	% OF TOTAL
	1 to 5	6 to 10	ADEQ	NOW		
Rural	0	0	168.585	0	**168.585**	64.57%
Semi Urban	0	0	36.92	0	**36.92**	14.15%
Urban	0	0	55.598	0	**55.598**	21.28%
TOTAL	**0**	**0**	**261.1**	**0**	**261.1**	
% OF TOTAL	0%	0%	100.00%	0%		

Not adjusted for boundary roads

There does not appear to be any capacity issues on the NotL road system.

4.7 Surface Type

A "Need' for surface type is typically caused when a Gravel surfaced road has an AADT of over 400, an Earth surface road is 50 or greater, or the road surface is gravel with a roadside environment or urban or semi-urban.

Table 4.12: Surface Type by Time of Need

Roadside Environment	Time of Need		TOTAL	% OF TOTAL
	ADEQ	NOW		
Rural	165.349	0.839	166.188	64.24%
Semi Urban	36.728	0.192	36.92	14.27%
Urban	55.598	0	55.598	21.49%
TOTAL	**257.675**	**1.031**	**258.706**	
	99.60%	0.40%		

Table 4.13 illustrates that the sections with a NOW Surface Need, all conform to those criteria.

Table 4.13: Roads Section with NOW Need for Surface Type

Asset ID	Street Name	From Desc	To Desc	Length	AADT	RDSD	Surface Type	Material Desc
1150	Warner Road	Concession 5 Road	0.3km West of Tanbark Road	0.781	576	Rural	NOW	Gravel, Stone, Other Loosetop
200	Line 2 Road	Regional Road 100 - Four Mile Creek Road	West End	0.1	50	Semi Urban	NOW	Gravel, Stone, Other Loosetop
28613	Eastchester Avenue	West End	House 153	0.058	50	Rural	NOW	Earth
398	Eastchester Avenue	House 153	House 165 Entrance	0.092	20	Semi Urban	NOW	Gravel, Stone, Other Loosetop

4.8 Boundary Roads

Boundary roads, are roads that a municipality would have in common with the abutting municipality. In order to manage the joint responsibilities, a Boundary Road Agreement that identifies the responsibilities of both agencies is created. The agreements are usually in writing; however, some are informal.

The Boundary Road Agreement should identify costs sharing and responsibility arrangements for maintenance or capital works on the road section. From a risk management perspective, the agreement reduces the risk for one of the parties in the event of a claim, depending upon the content of the agreement.

Boundary road reporting can be dealt with in one of two ways: the length can be split to provide a more accurate depiction of the road system that is actually maintained by the agency, or they may not be adjusted. When MTO was providing subsidy, the roads were adjusted for reporting and accounting purposes. For the purposes of this report adjustment has been made to the road system sizes to account for the 50% sharing of the length of the boundary roads.

When a boundary is reconstructed on a day labour basis by the adjacent municipalities, the project should be treated no differently than if the work were being tendered. The exposure to risk for the municipality is no different. Defining who is the 'contractor' is critical. The assignment of the various aspects of the work should be clear and the timing for completion of the tasks clearly identified and adhered to.

Niagara-on-the-Lake has 4.79 kilometres of boundary roads per Table 4.14. The adjustment factor is 50%; 2.395km

Table 4.14: Boundary Roads

Adjacent Agency	Asset ID	Street Name	Rural	Semi Urban	Urban	TOTAL
City of Niagara Falls	1130	Warner Road	0.69	0	0	**0.69**
City of Niagara Falls	24118	Steele Road	0.27	0	0	**0.27**
City of St. Catherines	1070	Read Road	0.49	0	0	**0.49**
City of St. Catherines	1075	Read Road	0.27	0	0	**0.27**
City of St. Catherines	1080	Read Road	1.06	0	0	**1.06**
City of St. Catherines	1085	Read Road	1.16	0	0	**1.16**
City of St. Catherines	1090	Read Road	0.55	0	0	**0.55**
City of St. Catherines	1093	Read Road	0.3	0	0	**0.3**
TOTAL			**4.79**	**0**	**0**	**4.79**

The status of the boundary road agreements should be reviewed/confirmed.

5 Road System Condition

Regulation 588/17 requires that;

'3. *For each asset category,*

i. a summary of the assets in the category,

ii. the replacement cost of the assets in the category,

iii. the average age of the assets in the category, determined by assessing the average age of the components of the assets,

iv. the information available on the condition of the assets in the category, and

v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.'

Regulation 588/17 also requires that;

'2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency, and based on data from at most two calendar years prior to the year in which all information required under this section is included in the asset management plan.'

Niagara-on-the-Lake is updating condition and attribute information for the road system in preparation for the 2025 Asset Management Plan required by O.Reg 588/17. The road system was updated in 2009, 2014, 2020, and in 2023 with this project. The review interval is less frequent that would be required to consistently meet the requirements of O.Reg 588/17.

The road section reviews follow the methodology of the Ministry of Transportation Inventory Manual for Municipal Roads, 1991.This ensures that pavement management decision making is based upon current data from field survey information and is completed in accordance with standard engineering practice. The Inventory Manual specifies that gravel roads be evaluated during the spring break-up period. The gravel road reviews were conducted during the spring break up period

An Asset Management Plan for Core Assets is required by July 1, 2025, based on dated collected no more than 2 years prior to the development of the plan. The 2023 project satisfies, but is at the limit of the regulation's criteria with respect to data currency requirements, for the road assets.

5.1 Road System Condition by Time of Need

The Inventory Manual methodology results in overall rating of road sections by Time of Need (TON); NOW, 1 to 5, 6 to 10, or Adeq (Adequate). Table 5.1 provides a breakdown of the road system by time of Need and MMS Class.

Table 5.1: Roads System by Time of Need and MMS Class

Time of Need	O.Reg 239/02 Classification								TOTAL	
	3		4		5		6			
	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km
1 to 5	6.12	12.24	10.143	20.44	10.654	21.308	1.395	2.79	**28.312**	**56.778**
6 to10	11.847	23.694	25.195	50.54	20.215	40.43	4.278	8.556	**61.535**	**123.22**
ADEQ	17.207	34.414	33.232	67.214	45.335	90.871	39.8	79.6	**135.574**	**272.099**
NOW	7.588	15.176	16.131	32.262	7.709	15.321	4.254	8.508	**35.682**	**71.267**
TOTAL	**42.762**	**85.524**	**84.701**	**170.456**	**83.913**	**167.93**	**49.727**	**99.454**	**261.103**	**523.364**
% OF TOTAL	16.01%	16.00%	35.62%	35.72%	31.53%	31.47%	16.78%	16.75%		
System Adequacy	82.3%	82.3%	81.0%	81.1%	90.8%	90.9%	91.4%	91.4%	**86.3%**	**86.4%**

Note: Includes all potential Time of Needs elements including Capacity, Drainage, Surface Width, Surface Type, Geometry and Structural Adequacy

5.2 Road System Adequacy

The system adequacy is a measure of the ratio of the 'NOW' needs to the total system, and includes needs from the six critical areas described earlier in the report. The overall TON is the most severe or earliest identified need. For example, a road section may appear to be in good condition, but is identified as a NOW need for capacity, indicating that it requires additional lanes. Similarly, it may be classified as a NOW need for drainage resultant from periodic flooding. Appendix A includes a more detailed description of the Inventory Manual methodology.

Equation 5-1: System Adequacy Calculation

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

Based on the current review of the road system, the current system adequacy measure is 86.3% meaning that, 86.3% of the road system is in fair to good to very good condition. The inverse would be that 13.7% of the system is in poor condition. The road system currently measures 261.103 CL-km (unadjusted for boundary roads), with 35.682 CL-km rated as deficient in the 'NOW' time period.

The *Inventory Manual* provides direction that roads with a traffic volume of less than 50 vehicles per day *are deemed to be adequate,* even if they have structural, geometric, or drainage deficiencies that would otherwise be identified as being in a Time of Need. This factor does have an effect of the System Adequacy measure. As such, the System Adequacy, as measured following the Inventory Manual methodology, may not be the public's perception of the system condition.

Originally, the intention was that the low volume roads were to be corrected within the maintenance allocation (as opposed to the capital allocation). Conditional grant funding no longer exists as it did until the mid 1990's.

To gain a more accurate reflection of the condition of the road network, the roads with an AADT of less than 50 have been analyzed and report as follows;

- 10.78% (28.176 km) of the roads system has an actual or estimated count of less than 50 vehicles per day. This measure includes the earth roads.

- 8.29% (21.655 km) would be "NOW' Needs if the '50' rule was not applied. .
- If the roads with an AADT of less than 50 roads were considered in the System Adequacy measure, then the system adequacy would be reduced by a further 8.29%. However, even with that reduction, the measure for System Adequacy would be above the recommended level.

The gravel roads were not reviewed during the spring break-up period as specified by the Inventory Manual. Once spring grading and gravelling have been completed, soft spots and frost boils cannot be assessed.

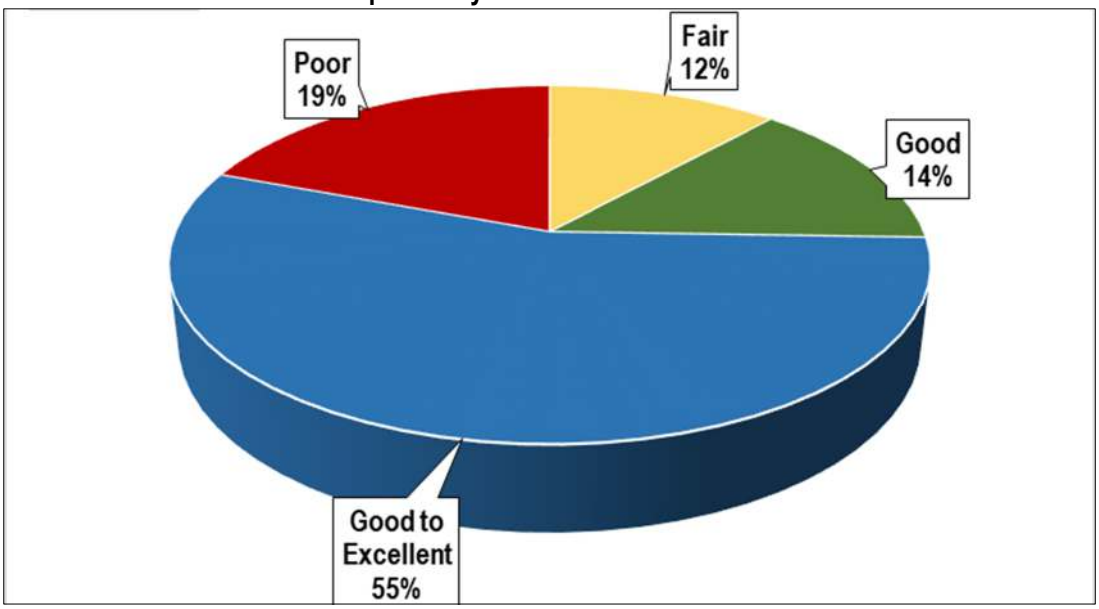
The System Adequacy is above the target established by the Ministry of Transportation when condition road funding was provided to municipalities. The targets for system adequacy were

- 60% for a lower tier system
- 75% for an upper tier system.
- 70% for a lower tier urban system

4 Roads is recommending a target System Adequacy of 60%to reflect the nature and function of NotL's system.

A simplified overview of the system condition is shown in the following chart.

Graph 5-1: System Condition Overview



The estimates provided in this report for standard improvements are in accordance with the formulae in the *Inventory Manual,* and utilize the unit costs as identified in Table 5.2. These costs include adjustment factors as per the *Inventory Manual*, such as Basic Construction, Terrain, Contingency Roadside Environment, and Engineering.

Table 5.2: Current Unit Costs

Item	Unit	2020 (BMC) Cost ($)	2023 (BMC) Cost ($)	% Increase
Excavation	m^3	15.69	41.00	161.31%
Hot Mix Asphalt	t	116.71	110.00	-5.75%
Single Surface Treatment	m^2	3.93	4.50	14.50%
Granular A	t	19.9	35.00	75.88%
Granular B	t	12.6	31.00	146.03%
Granular M (Maintenance Gravelling)	t	N/A	N/A	
Conc Base	m^3	N/A	N/A	
Conc- Curb and Gutter-place	linear m	78.23	108.00	38.05%
Conc- Curb and Gutter-removal	linear m	15.75	44.00	179.37%
Subdrains	linear m	18.59	19.25	3.55%
Storm Sewer-525mm	linear m	640.5	700.00	9.29%
Microsurfacing	m^2	3.5	5.50	57.14%
Manholes	ea	8,547.74	10,000.00	16.99%
Manhole removed	ea	787.5	787.50*	0.00%
Manholes-Adjust	ea	675.68	675.88*	0.03%
Catch Basins	ea	2,372.75	3,500.00	47.51%
Catch-Basins- Removed	ea	700	700.00	0.00%
Catch Basin Leads	linear m	139.65	500.00	258.04%
Catch Basins – Adjust	ea	675.68	675.88*	0.03%
Asphalt Planing	m^2	9.44	2.40	-74.58%
Asphalt Pulverizing	m^2	5	2.75	-45.00%
Crack Sealing	lm	2.89	2.57	-11.07%
Slurry		N/A	N/A	

Note: '*' Where current unit costs were unavailable or were significantly at variance with the 2020 costs, the 2020 costs were used.

Based on the current unit costs being experienced, the estimated total cost of recommended improvements is **$68,083,282.** The improvement costs include **$22,788,917** for those roads identified as NOW needs and **$45,294,365** is for road work required in the '1 to 10' year time period or for maintenance. Included in those amounts is **$8,598,702**for work on road sections that are adequate due to low traffic volume or are maintenance or preservation activities.

Tables 5.3 and 5.4 provide further detail on the needs.

5.2.1 Inflationary Increases

Inflationary increases have been significant over the past few years for a variety of reasons. **The impact in 2023 compared to 2020 has been a 69.8% increase in the replacement cost of the road system**. This is based on a comparison of the road system replacement costs using the same standardized calculations.

The unit costs for Earth Excavation, Granular A, and Granular B have increase significantly since 2020 and are the most significant contributors to the increase.

5.3 Record of Assumptions –TON, Improvement and Replacement Costs

The methodology of this report is such that the Inventory Manual itself forms the basis of a large number of assumptions in terms of;

- Dimensional requirements for the development of improvement and replacement costs
- Structural requirements based on road classification
- Time of needs based on the ratings and subsequent calculations

Deterioration assumptions effect of treatments on the asset are included in Appendix C.

With respect to the urban or semi urban cross sections, where there were sewers, it was generally assumed that the storm sewers were adequate. The resultant improvement type of those sections would then be RNS – Reconstruction Nominal Sewers. With respect to some semi urban sections the recommendations were also RNS as it appeared that the short length of a section could be adequately drained via curb and gutter to a storm sewer on an adjacent sewer.

Table 5.3: Improvement Costs by Improvement Type and Time of Need

Improvement Class	Improvement ID / Description		Time of Need								TOTAL		% OF TOTAL	
			1 to 5		6 to 10		ADEQ		NOW					
			Imp. Cost	CI km	Imp. Cost	CI km	Imp. Cost	CI km	Imp. Cost	CI km	Imp. Cost	CI km	Imp. Cost	CI km
Const	BS	Base and Surface	1,049,734	2.021	336,480	0.611	6,155,469	4.194	6,923,343	13.907	**14,465,026**	**20.733**	21.25%	8.01%
Const	NONE	No Improvement Required	0	0.086	0	0		99.019		1.433		**100.538**		38.86%
Const	REC	Reconstruction - Rural	1584196	1.25		0	444,448	0.273	2,037,422	2.062	**4,066,067**	**3.585**	5.97%	1.39%
Const	RMrural	Major Resurfacing	0	0		0		0	77,342	0.148	**77,342**	**0.148**	0.11%	0.06%
Const	RNS	Reconstruction Nominal Storm Sewer	0	0	112,644	0.101		0		0	**112,644**	**0.101**	0.17%	0.04%
Const	RSS	Reconstruction with Storm Sewers	11240570	3.561	4,227,717	1.363	882,170	0.264	9,818,219	3.044	**26,168,676**	**8.232**	38.44%	3.18%
Const	RW	Resurface and Widen	0	0	47,113	0.17	180,478	0.151	416,905	1.193	**644,496**	**1.514**	0.95%	0.59%
Const	SRR	Storm Sewer and Road Reinstatement	0	0	5,639,805	3.206		0		0	**5,639,805**	**3.206**	8.28%	1.24%
Maint	CRK	Crack Sealing	0	0		0	25,554	9.943		0	**25,554**	**9.943**	0.04%	3.84%
Maint	CRKsd	Crack Sealing and Spot Drainage	0	0	16,283	1.095	2,216	0.149		0	**18,498**	**1.244**	0.03%	0.48%
Maint	MICRO	Microsurfacing	0	0	5,470	0.153	168,790	3.434		0	**174,259**	**3.587**	0.26%	1.39%
Maint	SD	Spot Drainage	2427	0.148	348,582	21.255	121,524	7.138	8,676	0.529	**481,209**	**29.07**	0.71%	11.24%
Maint	SR	Spot Repairs	0	0		0.1		0		0.129		**0.229**		0.09%
Rehab	DSTrehab	Double Surface Treatment Rehabilitation	2177879	10.633	530,525	2.283	191,446	0.814	342,779	1.677	**3,242,630**	**15.407**	4.76%	5.96%
Rehab	PR2	Pulverize and Resurface 2 - 100mm	1,350,132	5.106		0	126,331	0.245	2,897,768	8.975	**4,374,231**	**14.326**	6.42%	5.54%
Rehab	R1	Basic Resurfacing 1 - 50mm	113,436	0.84	3,703,211	14.431	10,532	0.078		0	**3,827,179**	**15.349**	5.62%	5.93%
Rehab	R2	Basic Resurfacing 2 - 100mm	2,550,779	4.667	1,064,273	4.17		0	223,949	0.392	**3,839,001**	**9.229**	5.64%	3.57%
Rehab	SST++	SST, 10% Base Repairs, Minor Ditching	0	0	549,163	11.373	48,212	1.054	42,514	0.945	**639,889**	**13.372**	0.94%	5.17%
Rehab	SST+	Single Surface Treatment and Minor Ditching	0	0	45,244	1.277	40,714	1.114		0	**85,958**	**2.391**	0.13%	0.92%
Rehab	SST	Single Surface Treatment	0	0	0	0	200,820	6.504		0	**200,820**	**6.504**	0.29%	2.51%
TOTAL			**20,069,154**	**28.312**	**16,626,509**	**61.588**	**8,598,702**	**134.372**	**22,788,917**	**34.434**	**68,083,282**	**258.706**		
% OF TOTAL			29.48%	10.94%	24.42%	23.81%	12.63%	51.94%	33.47%	13.31%				

Table 5.4: Improvement Costs By Roadside Environment

Improvement Class	Improvement ID / Description		Roadside Environment						Total		%Total		Average Cost /km	Rural Average	Semi Urban Average	Urban Average
			Rural		Semi Urban		Urban									
			Imp. Cost	CI-km	Imp. Cost	CI-km	Imp. Cost	CI-km	Imp. Cost	CI-km	Imp. Cost	CI-km				
Const	BS	Base and Surface	13,668,982	19	796,044	1.342	0	0	**14,465,026**	**20.733**	21.25%	8.01%	697,681	704,914	593,177	NA
Const	NONE	No Improvement Required	0	60.23	0	6.11	0	34.198	**0**	**100.538**		38.86%				
Const	REC	Reconstruction - Rural	2,437,162	2	1,628,904	1.583	0	0	**4,066,067**	**3.585**	5.97%	1.39%	1,134,189	1,217,364	1,028,998	NA
Const	RMrural	Major Resurfacing-Rural	0	0	77,342	0.148	0	0	**77,342**	**0.148**	0.11%	0.06%	522,581	NA	522,581	
Const	RNS	Reconstruction Nominal Storm Sewer	0	0	112,644	0.101	0	0	**112,644**	**0.101**	0.17%	0.04%	1,115,287	NA	1,115,287	
Const	RSS	Reconstruction with Storm Sewers	0	0	26,168,676	8.232	0	0	**26,168,676**	**8.232**	38.44%	3.18%	3,178,897	NA	3,178,897	
Const	RW	Resurface and Widen	0	0	464,018	1	180,478	0	**644,496**	**1.514**	0.95%	0.59%	425,691	NA	340,439	1,195,219
Const	SRR	Storm Sewer and Road Reinstatement	0	0	5,639,805	3.206	0	0	**5,639,805**	**3.206**	8.28%	1.24%	1,759,141	NA	1,759,141	
Maint	CRK	Crack Sealing	2,118	1	2,005	1	21,431	8	**25,554**	**9.943**	0.04%	3.84%	2,570	2,570	2,571	2,570
Maint	CRKsd	Crack Sealing and Spot Drainage	0	0	18,498	1.244	0	0	**18,498**	**1.244**	0.03%	0.48%	14,870	NA	14,870	NA
Maint	MICRO	Microsurfacing	0	0	5,470	0	168,790	3	**174,259**	**3.587**	0.26%	1.39%	48,581	NA	35,752	49,153
Maint	SD	Spot Drainage	333,035	20	145,730	9	2,444	0	**481,209**	**29.070**	0.71%	11.24%	16,553	16,623	16,400	16,403
Maint	SR	Spot Repairs	0	0	0	0	0	0.229	**0**	**0.229**		0.09%	NA	NA	NA	NA
Rehab	DSTrehab	Double Surface Treatment Rehabilitation	3,242,630	15.407	0	0	0	0	**3,242,630**	**15.407**	4.76%	5.96%	210,465	210,465	NA	NA
Rehab	PR2	Pulverize and Resurface 2 - 100mm	4,271,902	14	102,329	0.366	0	0	**4,374,231**	**14.326**	6.42%	5.54%	305,335	306,010	279,587	NA
Rehab	R1	Basic Resurfacing 1 - 50mm	1,202,221	8	303,718	2	2,321,239	5	**3,827,179**	**15.349**	5.62%	5.93%	249,344	149,233	132,339	464,434
Rehab	R2	Basic Resurfacing 2 - 100mm	1,028,173	4	345,290	1	2,465,538	4	**3,839,001**	**9.229**	5.64%	3.57%	415,972	255,892	310,792	601,351
Rehab	SST++	SST, 10% Base Repairs, Minor Ditching	639,889	13.372	0	0	0	0	**639,889**	**13.372**	0.94%	5.17%	47,853	47,853	NA	NA
Rehab	SST+	Single Surface Treatment and Minor Ditching	85,958	2.391	0	0	0	0	**85,958**	**2.391**	0.13%	0.92%	35,951	35,951	NA	NA
Rehab	SST	Single Surface Treatment	200,820	6.504	0	0	0	0	**200,820**	**6.504**	0.29%	2.51%	30,876	30,876	NA	NA
TOTAL			**27,112,889**	**166.188**	**35,810,473**	**36.920**	**5,159,919**	**55.598**	**68,083,282**	**258.706**						
% OF TOTAL			39.82%	64.24%	52.60%	14.27%	7.58%	21.49%								

6 Replacement Cost Valuation

Program funding recommendations are a function of the dimensional information, surface type, roadside environment, and functional class of the individual assets. Recommended funding for the road system should include sufficient capital expenditures that would allow for the replacement of infrastructure as the end of design life is approached, in addition to sufficient funding for maintenance, to ensure that that full life expectancy may be realized.

Budgetary recommendations in this report do not include items related to development and growth or roads under another road authority's jurisdiction. The Municipality should consider those items as additional to the recommendations in this report. Generally, that type of improvement or expansion to the system would be funded from a different source, such as Development Charges.

The budget recommendations bear a direct relationship to the value of the road system. 4 Roads estimates the cost to replace the road system, to the current standard, at **$426,520,900**. This estimate is based on the municipality's unit costs using the standardized formulae in the Inventory Manual. The current estimated value of the road system is $356,503,000.

Unit costs should be reviewed and adjusted annually. Unit cost changes impact funding requirements directly.

Tables 6.1 and 6.2 provide further detail on the replacement cost of the road system.

Table 6.1: Replacement Cost by Functional Classification (Inventory Manual)

Functional Classification	Lanes	Roadside Environment						TOTAL		% OF TOTAL	
		Rural		Semi Urban		Urban					
		Repl. Cost	Length (km)	Repl. Cost	Length (km)	Repl. Cost	Length (km)	Repl. Cost	Length (km)	Repl. Cost	Length (km)
100	2	9,637,298	26.426	0	0.000	0	0.000	**9,637,298**	**26.426**	2.26%	10.12%
200	2	19,481,547	19.982	0	0.000	0	0.000	**19,481,547**	**19.982**	4.57%	7.65%
300	2	29,580,797	28.663	0	0.000	0	0.000	**29,580,797**	**28.663**	6.94%	10.98%
400	2	55,870,983	40.258	0	0.000	0	0.000	**55,870,983**	**40.258**	13.10%	15.42%
500	2	48,516,940	31.719	0	0.000	0	0.000	**48,516,940**	**31.719**	11.38%	12.15%
600	2	19,043,023	10.050	0	0.000	0	0.000	**19,043,023**	**10.050**	4.46%	3.85%
700	2	14,829,626	7.346	0	0.000	0	0.000	**14,829,626**	**7.346**	3.48%	2.81%
800	2	8,312,085	4.141	0	0.000	0	0.000	**8,312,085**	**4.141**	1.95%	1.59%
C/R	2	0	0.000	3,090,509	2.239	6,257,571	1.912	**9,348,080**	**4.151**	2.19%	1.59%
C/R	3	0	0.000	345,388	0.153	1,224,875	0.304	**1,570,263**	**0.457**	0.37%	0.18%
CCI	2	0	0.000	0	0.000	572,998	0.152	**572,998**	**0.152**	0.13%	0.06%
CCI	3	0	0.000	0	0.000	2,772,342	0.597	**2,772,342**	**0.597**	0.65%	0.23%
L/R	1	0	0.000	0	0.000	272,978	0.097	**272,978**	**0.097**	0.06%	0.04%
L/R	2	0	0.000	34,779,762	33.263	165,380,057	51.058	**200,159,819**	**84.321**	46.93%	32.29%
L/R	3	0	0.000	0	0.000	750,792	0.201	**750,792**	**0.201**	0.18%	0.08%
LCI	2	0	0.000	1,611,535	1.265	4,189,766	1.277	**5,801,301**	**2.542**	1.36%	0.97%
TOTAL		**205,272,299**	**168.585**	**39,827,194**	**36.920**	**181,421,379**	**55.598**	**426,520,872**	**261.103**		
% OF TOTAL		48.13%	64.57%	9.34%	14.14%	42.54%	21.29%				

Table 6.2: Replacement Cost by Performance Model Asset Class

Asset Class	Roadside Environment						TOTAL		% OF TOTAL		Cost /km $
	Rural		Semi Urban		Urban						
	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	Cl-km	Lane-km	
ETH-R		16.723						**16.723**		6.40%	0
GST1-R	14,550,776	14.700					**14,550,776**	**14.700**	3.41%	5.63%	989,849
GST1-S			201,741	0.192			**201,741**	**0.192**	0.05%	0.07%	1,050,734
HCB3-R	60,742,862	34.192					**60,742,862**	**34.192**	14.24%	13.10%	1,776,523
HCB3-S			8,303,553	6.946			**8,303,553**	**6.946**	1.95%	2.66%	1,195,444
HCB3-U					38,633,454	11.429	**38,633,454**	**11.429**	9.06%	4.38%	3,380,300
HCB4-R	9,137,815	6.750					**9,137,815**	**6.750**	2.14%	2.59%	1,353,750
HCB4-S			21,391,070	20.074			**21,391,070**	**20.074**	5.02%	7.69%	1,065,611
HCB4-U					141,918,753	43.898	**141,918,753**	**43.898**	33.27%	16.81%	3,232,921
LCB1-R	120,840,846	96.220					**120,840,846**	**96.220**	28.33%	36.85%	1,255,881
LCB1-S			9,930,830	9.708			**9,930,830**	**9.708**	2.33%	3.72%	1,022,953
LCB1-U					869,172	0.271	**869,172**	**0.271**	0.20%	0.10%	3,207,277
TOTAL	205,272,299	168.585	39,827,194	36.920	181,421,379	55.598	**426,520,872**	**261.103**			
% OF TOTAL	**48.13%**	**64.57%**	**9.34%**	**14.14%**	**42.54%**	**21.29%**					

7 Asset Condition Assessment and Plan Updates

7.1 Condition Assessment Cycle Recommendation

O.Reg 588/17 requires work plan developed based on condition data that is no more than two years old. The Municipality inspection regimen has not been to that standard. The current project produces road system condition data within two years of the AMP due date. As such, the current report is regulatory compliant with respect to road condition data currency.

This project would make the municipality compliant for the condition of the road system with respect to the preparation of an Asset Management Plan for 2025.

NotL's road system review interval should be revised to remain complaint with O.Reg 588/17. A two year interval is recommended.

8 Level of Service (LOS)

As noted in Section 4 of this report, road system condition and Level of Service (LOS) measures are inextricably linked, and for that reason, some of the measures are shown in both areas of this report. For roads, as with most assets, a single measure for condition or level of service may not provide a complete or accurate view of the performance of an asset group.

Level of Service has a different meaning for different interests. For instance, the cost per unit may not have an impact to a ratepayer whose chief concern may be actual service delivery itself. Similarly, cost or expenditure per unit may not illustrate the condition of the asset to the end user.

Regulatory compliance with Regulation 239/02 may also be considered a level of service. The regulation provides for correction/resolution to identified defects with specified time periods dependent upon posted speed limit and traffic count.

4 Roads believes that multiple service measures may be required to adequately relate the condition of an asset to the various user groups; condition, operating costs, and end user. The following sections identify various measurements of service of the road system.

Regulation 588/17, Asset Management Planning for Municipal Infrastructure, requires that hard topped surfaces be rated using a Pavement Condition Index (PCI). The regulation is non-specific as to the PCI methodology. Table 4 from the regulation is shown below.

Table 8.1: Regulation 588/17, Table 4

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 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-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres 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).

From **ASTM 6433**, Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys;

> *2.1.4 pavement condition index (PCI)—a numerical rating of the pavement condition that ranges from 0 to 100 with 0 being the worst possible condition and 100 being the best possible condition.*
>
> *4.1 The PCI is a numerical indicator that rates the surface condition of the pavement. The PCI provides a measure of the present condition of the pavement based on the distress observed on the surface of the pavement, which also indicates the structural integrity and surface operational condition (localized roughness and safety). The PCI cannot measure structural capacity nor does it provide direct measurement of skid resistance or roughness. It provides an objective and rational basis for determining maintenance and repair needs and priorities. Continuous monitoring of the PCI is used to establish the rate of pavement deterioration, which permits early identification of major rehabilitation needs. The PCI provides feedback on pavement performance for validation or improvement of current pavement design and maintenance procedures.*

There is also a significant difference in the weighting of ride in the PCI measure. In some of the MTO methodologies it is significantly weighted whereas, for example, in ASTM 6433, ride is rated indirectly on four of nineteen distresses.

In the Inventory Manual methodology, 'ride' (Surface Condition) is not a trigger for any improvement or time of need. Further, there is not necessarily a relationship between ride and distress.

In WorkTech, Physical Condition is the Structural Adequacy multiplied by 5 to produce a score from 5 to 100; effectively a PCI by definition.

There are number of PCI methodologies in use in Ontario.

The different methodologies can produce a different 'PCI' for the same section of road. As such, it is critical for an agency to understand the methodology used, and trigger points for treatments. There is further explanation of this concept in Appendix C of this report.

A PCI is one type of measure for level of service.

8.1 Current Level of Service Measurement

8.1.1 System Adequacy

System Adequacy was discussed earlier in the report as a measure of the condition of the road system. It also represents a level of service measure. The current system adequacy is 86.3% indicating that 86.3% of the system is in fair to good to excellent condition. The inverse is that 13.7% of the road system is in poor condition. Figure 8.2 provides a graphic of LOS measures over time. As noted earlier in the report, using the Inventory Manual methodology, roads with an AADT of less than 50 are deemed adequate. If this factor were disregarded then the System Adequacy would be 78.01%.

As noted in section 4.2, the System Adequacy is above the target established by the Ministry of Transportation when condition road funding was provided to municipalities. The targets for system adequacy were;

- 60% for a lower tier system
- 75% for an upper tier system.
- 70% for a lower tier urban system

4 Roads is recommending a target System Adequacy of 60%to reflect NotL's system.

8.1.2 Physical Condition

The Physical Condition is an alternate method of describing the condition of a road section or the average condition of the road system. By the ASTM definition, it is a Pavement Condition Index (PCI). The value is the structural adequacy converted to be expressed as a value out of 100, instead of 20. This methodology lends itself to modeling and comparators that may be more easily understood. There isn't a 1:1 relationship between the weighted average physical condition and the system adequacy. It would cost approximately $1,195,200 to raise the system condition to 70.

The Weighted Average Physical Condition of the road system is currently 68.67.

4 Roads' recommendation is that the weighted average Physical Condition be at 70 or above.

8.1.3 Good to Very Good Roads

It has been assumed that the 6-10 and adequate roads are good to very good and this has been expressed as a percentage of the system. Good to Very Good roads represent 69% of the road system based on CL-km and the Structural Adequacy measure.

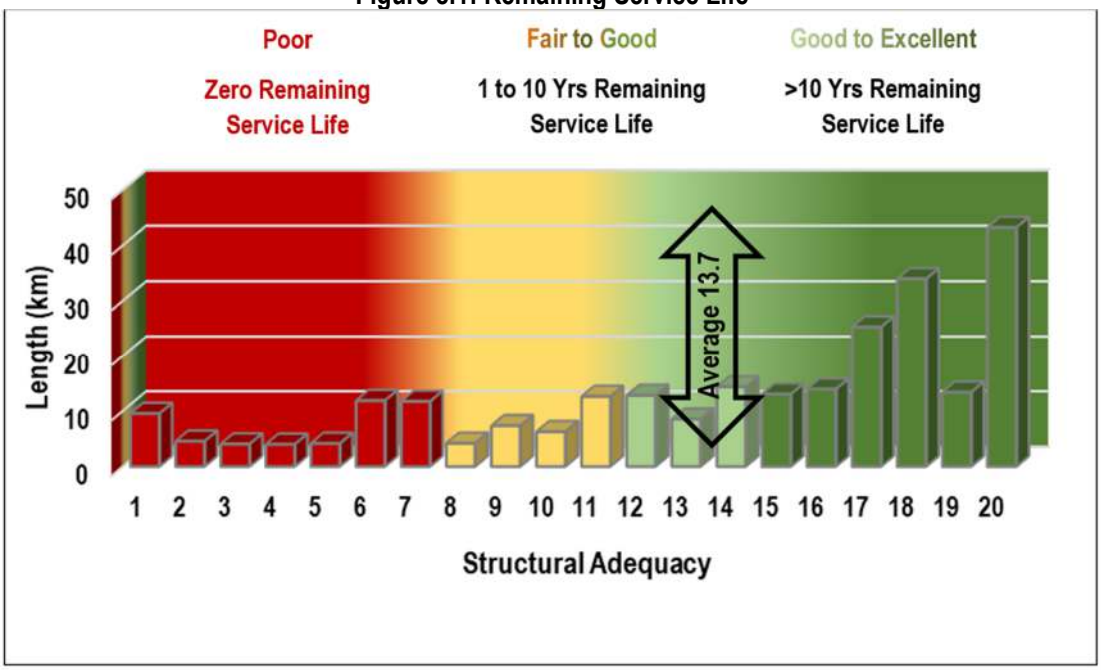
4 Roads recommendation is that Good to Very Good roads be at 60% or higher.

8.1.4 Estimated Remaining Service Life

As indicated previously, the Time of Need is really a prediction model in terms of an estimate based on current condition to the time for reconstruction. The TON then also provides an estimate of the remaining life in the road system/section. The following figure summarizes the structural adequacy ratings of the road system and illustrates the estimated remaining service life of the road system.

Based on the current weighted average physical condition, the entire system would have approximately 17 years until it reached the poor designation if no further expenditures were made.

Figure 8.1: Remaining Service Life



Note: Physical Condition is Structural Adequacy multiplied by 5; Average is 68.7 recommended 70 or greater

8.1.5 Capacity

The *Inventory Manual* methodology includes a calculation to determine if there is potential for a capacity problem on road assets. The calculation is based on a number of data fields in the database including but not limited to AADT, pavement width, shoulder width, terrain, and the number of entrances.

Niagara-on-the-Lake does not appear to have a potential capacity issues. This should be reviewed further with any transportation plan update.

Item 94 in the Inventory Manual addresses the capacity calculation and guidance for developing an appropriate recommendation.

8.1.6 Regulation 588/17 Level of Service Measures

Regulation 588/17 came into effect December 27, 2017, and provides different service measures dependent upon asset type.

Table 8.2: Regulation 588/17 Level of Service Measures for Roads

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)	Level of Services Measure for Roads
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality. **132.83** sq. km	Arterial Roads = 0% Collector Roads = 192.7% Local Roads = 201.3%
	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).	Weighted Average Overall road condition is 68.7 Weighted average paved road condition is 73.3 Weighted average gravel road condition is 63.4

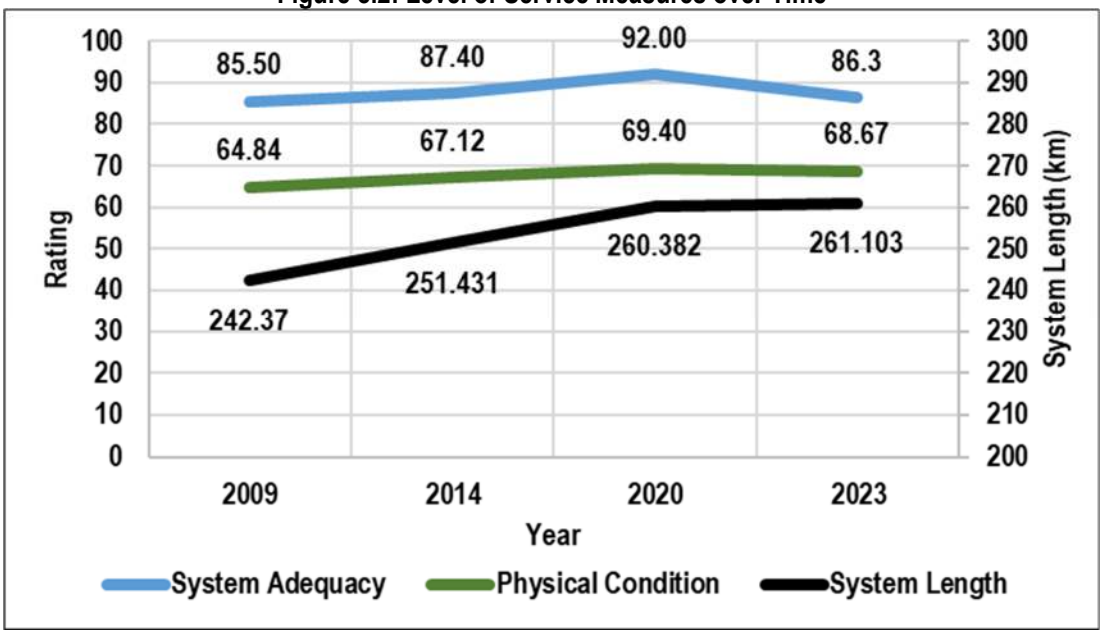
8.1.7 Level of Service Measures History

Niagara-on-the-Lake has had their road system condition reviewed at regular intervals for decades. The interval has been greater than that specified in O.Reg 588/17.

Figure 8.-2 shows the history of the system adequacy and condition from 2009 to the present (2023).

Given that the overall measures appear to be approximately the same as they were 14 years ago, and that there has been growth and the addition of new roads, it doesn't appear that the annual funding level, in conjunction with the programming, may be sufficient to sustain the system over time.

Figure 8.2: Level of Service Measures over Time



9 Asset Management Strategy

9.1 Asset Management Definition

Asset management has almost as many definitions as there are agencies that manage assets.

In 1999, the Transportation Association of Canada adopted a definition prepared by the U.S. Department of Transportation

> *'Asset Management is a framework for making cost effective resource allocation, programming and management decisions. It combines engineering principles with sound business practices and economic theory, and provides tools to facilitate a more organized, logical and comprehensive approach to decision making.'*

This definition may be applied to any asset.
Regardless of the source of the definition, the key themes that keep being repeated are;

- Managing
- Strategic
- Effective
- Efficient
- $$$$$!!
- Service
- Optimizing asset life cycle
- Risk Management

9.1.1 Asset Management and PSAB

Asset Management and PSAB both address tangible capital assets – but from completely different perspectives.

From a very simplistic perspective, PSAB 3150 establishes standards on how to account for and report tangible capital assets in government financial statements. It deals with the historic costs and amortization. Financial reporting is a requirement of the Municipal Act, 2001.

Asset management deals with the same assets but from a current and future planning perspective. Asset management is a requirement of O.Reg 588/17 Asset Management Planning for Municipal Infrastructure, made under the Infrastructure for Jobs and Prosperity Act, 2015.

9.2 Asset Management Systems

Asset Management software alone is not an asset management system.

ISO is the International Organization for Standardization. The following excerpt is from ISO 55001;

> *'An asset management system is a set of interrelated and interacting elements of an organization, whose function is to establish the asset management policy and asset management objectives, and the processes, needed to achieve those objectives. In this context, the elements of the asset management system should be viewed as a set of tools, including policies, plans, business processes and information systems which are integrated to give assurance that the asset management activities will be delivered.'*

An agency managing assets has to have 'rules of engagement' to ensure the asset management system functions as intended and there is a reproducibility of results.

The level of granularity of the rules begins with issues as simple as what constitutes a valid entry code for a data field, how assets are created and defined or how the unit costs are developed. Is it defensible and repeatable?

ISO 55000, 55001, and 55002 are all asset management related and speak in detail to asset management and asset management systems.

9.3 Asset Management Goal

As an absolute minimum, the objective of any asset management plan, or strategy, should be to ensure that the overall condition of an asset group does not diminish over time. This objective was a requirement of Regulation 588/17 for the asset management plans that were due July 1, 2022.

The asset management strategy of an agency is heavily predicated, and inextricably linked to the available funding. Funding has to be adequate to sustain the asset group. For most municipalities this is a significant challenge.

9.3.1 Asset Management Plan (AMP) and O.Reg 588/17

On December 27, 2017, the Province of Ontario filed Regulation 588/17, Asset Management Planning for Municipal Infrastructure. The regulation provides the province's requirements for scope and content for a municipal asset management plan. Regulatory Compliance is required for a successful application for a conditional grant for municipal infrastructure projects.

Table 9.1: Municipal Asset Management Plan Implementation Schedule (from MOI later dated May 31, 2019)

Date	Milestone
July 1, 2019	Date for municipalities to have a finalized strategic asset management policy that promotes best practices and links asset management planning with budgeting, operations, maintenance and other municipal planning activities.
July 1, 2021	Date for municipalities to have an approved asset management plan for core assets (roads, bridges and culverts, water, wastewater and stormwater management systems) that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2023	Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.
July 1, 2024	Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that builds upon the requirements set out in 2023. This includes an identification of proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund these activities.

The Milestone date for the Asset Management Plan for Core Assets was subsequently revised to be July 1, 2022, and the Milestone date for the remainder of the assets to July 1, 2025.

The regulation is a complex document and should be reviewed in detail by municipalities as soon as possible.

Although the timelines appear to be reasonable, once the requirements for content of the Strategic Asset Management Policy are reviewed, it will be obvious that there should be significant understanding of the asset groups at the time of preparation of the policy as there are potentially significant budget implications, particularly if the asset groups are not at a reasonable average condition currently and/or are underfunded.

Section 11 includes further discussion on the Regulatory requirements with respect to work plan development.

9.3.2 AMP Funding Level Development

The development of an appropriate asset management plan may be a daunting task for municipalities. An AMP for the core primary assets by July 1, 2022 was a requirement of O.Reg 588/17. An AMP for all assets, is required by July 1, 2025

The AMP development will be particularly daunting.

To be clear, the current budget does not define or limit the AMP. The funding level for the AMP is driven by the assets, their condition and lifecycle costs and required lifecycle activities – not the current budget. The budget should be determined by the requirements of the lifecycle activities of the assets, and maintaining them in at least the same average condition.

AMP's that are developed to match current budgets- if underfunded- will result in failure and non compliance with O.Reg 588/17.

Section 11 of this report provides recommendations for funding levels for long term sustainability and programs.

Most agencies are not fully funded, and a large number are not even funded sufficiently as to maintain the current condition of their system. In those circumstances, the strategy should be twofold

- Focus should be on a pavement management strategy that utilizes available funding on preservation and resurfacing programs as a priority. Reconstruction and replacement candidates will remain reconstruction and replacement candidates and cost increases will be incremental with inflation. Preservation and resurfacing opportunities that are missed will escalate in cost by several hundred percent depending on site specifics.
- Develop the financial plan in order that there is sufficient funding to maintain the condition of the road system through prioritizing preservation and rehabilitation treatments.

The current funding level for Niagara-on-the-Lake appears to be sufficient to sustain the system over the short term, *but* is dependent/ will be affected by project selection and programming.

The caveat being that the model assumes the that the recommended program will be adhered to and deterioration will be as predicted. Further, there will be some road sections in poor condition that will not be addressed in the program.

9.4 Priority Rating vs. Condition Rating

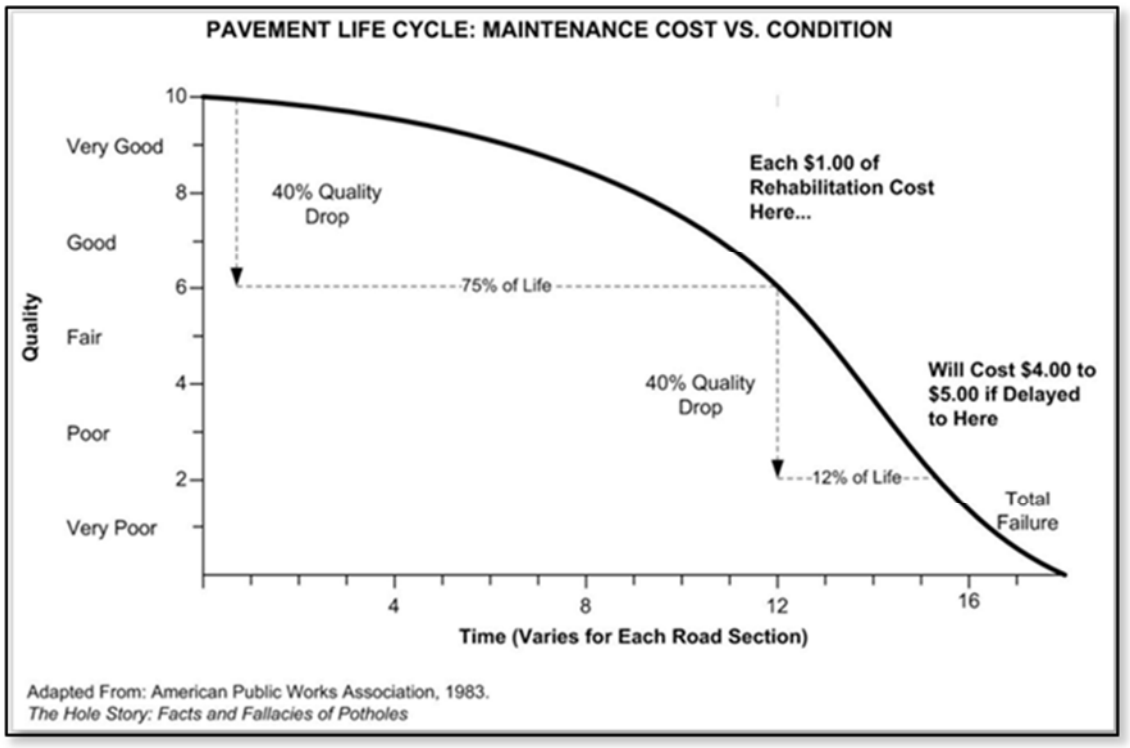
Information in a database may be sorted and analyzed in numerous ways. Understanding what the information in a data field represents, is key to the analysis. The Inventory Manual has many rated and calculated data fields and thus provides for many ways to sort data. Some commonly used representations, or sorting of information, from the database include:

- Priority Rating
- Priority Guide Number
- Structural Adequacy (Condition)

Priority Rating is a calculated field in the Inventory Manual, and is a function of the traffic count and the overall condition rating of the road section. This approach adds weight to the traffic count of the section; a higher volume road in poorer condition will have a higher priority number. Although the word 'priority' is included in the field name, a road section that has a higher calculated 'Priority Rating' is *not* necessarily a higher priority in the broader sense of asset management.

Similarly, a municipality may choose to sort the road sections based on condition and cost per vehicle. The Priority Guide Number data field would assist in providing that analysis, as sorting on that parameter would prioritize road sections that have higher traffic and thus a lower cost per vehicle.

Figure 9.1: Treatment Cost vs. Deterioration



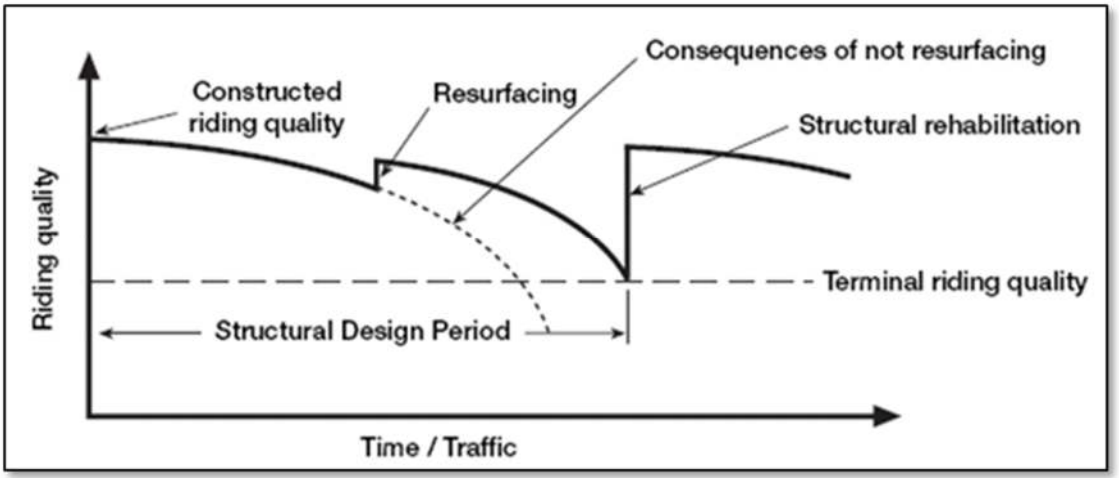
Developing a road capital program around the Priority Rating or Priority Guide Number fields will result in programming that would lead to a less efficient expenditure of funds and reduced system performance per budget dollar, as road sections with high traffic and in poor condition would be selected first, as opposed to selecting the best rehabilitation candidates at the appropriate time in their life cycles. The exception to this statement would be cases where rehabilitation funding is at a high enough level to ensure that the preservation program requirements can be met.

To paraphrase Regulation 588/17, program development is to be based on selecting the lowest cost lifecycle activities that will maintain the condition of the system over a 10 year period.

From a more current asset management perspective, project selection should be predicated by condition (Structural Adequacy, PCI or PQI) depending on agency. Figure 9.1 clearly illustrates the financial advantages of managing the road system by performing the right treatment at the right time of the asset life cycle. If appropriate strategies are not undertaken at the correct time, available funding usage is less effective.

Ideally, if a road is constructed and maintained with timely appropriate maintenance and resurfacing, the road system will reach a point where the majority of the activities will be preservation and resurfacing. Figure 9.2 clearly illustrates the effect the life span of a pavement by applying the correct treatment at the correction time in the life cycle.

Figure 9.2: Pavement Management- The Right Treatment at the Right Time

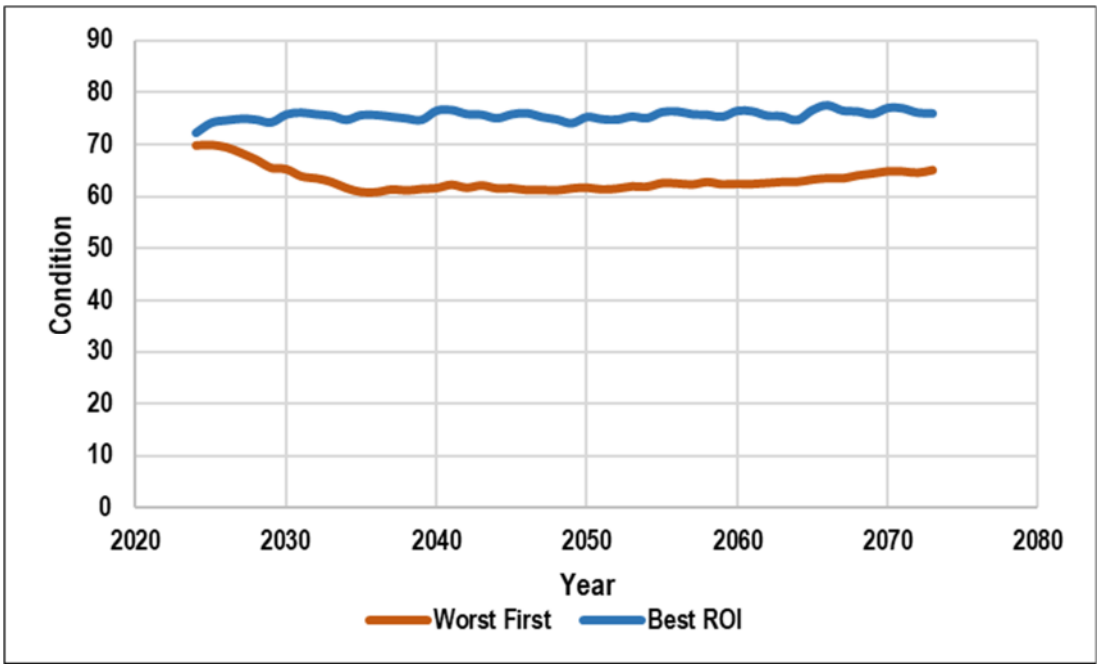


Source: Wirtgen Cold Recycling Manual

If an agency's budget is fully funded, the programming will include reconstruction, resurfacing, and preservation programs. Prioritization within the different programs will vary as demands are different. However, within the resurfacing and preservation programs, the pavement condition should drive the decision making.

Figure 9.3 illustrates the difference in system performance over time where best Return on Investment drives the project selection rather than worst first. The model is for the Niagara-on-the-Lake system at the short term sustainability funding level. When available funding is limited, treatment / project selection is critical. Prioritizing worst first projects will result in a considerably poorer performance of the road system over time.

Figure 9.3: System Performance –Worst First (Priority #) vs Best ROI at Current Funding Level



The blue line is system performance based on a best return on investment project selection and the brown line is the system performance based on worst first (priority number). (The priority number is a function of condition and traffic – a poor condition road with high traffic would generate a higher priority number.) The differences in performance are more dramatic when annual budgets are minimal.

9.5 Maintenance Paving

From an asset management perspective, even when funding is limited, resurfacing and preservation programs should be prioritized over the construction program. The effect of this approach will be that 'NOW' need roads will remain 'NOW' needs. However, by virtue of their 'NOW' need condition, 'NOW' need roads will require increased maintenance and likely generate increased complaints from the driving public. To deal with this eventuality, a municipality should create a **'Maintenance Paving Budget'**, over and above the resurfacing budget. The purpose of this budget is to defer the reconstruction needs and reduce maintenance efforts and complaints until the road can be reconstructed.

In terms of compliance with O.Reg 588/17, there are references from the Ministry of Transportation Inventory Manual for Municipal Roads to support this argument. The NotL road system has been following the Ministry of Transportations' Inventory Manual for Municipal Roads Methodology for many years.

Further supporting the argument that the "Maintenance Paving" program will meet the intent of O.Reg 588/17, Item 87 Structural Adequacy, which is a measure of the percentage of distress in the road section, indicates that adding 50mm of asphalt to a Now or 1 to 5 year need road raises the condition to a minimum of 13; effectively moving the section to a 6 to 10 year need.

9.6 Optimal Programming and Network Condition

Section 8.1.2 of this report provides information on the current weighted average physical condition of the road system. Figure 9.4 from the Transportation Association of Canada's Pavement Asset Design and Management Guide provides a visual representation of various measures of road network and individual section performance.

Figure 9.4: Service Levels and Triggers for Pavement Improvements

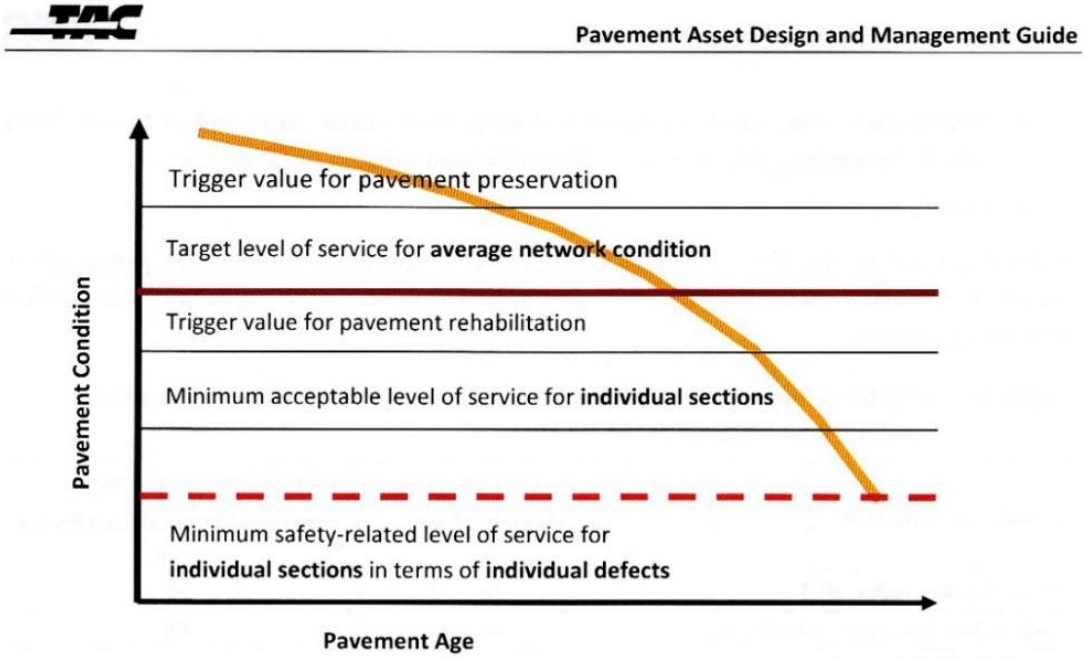


Figure 5.3 – Types of Service Levels and Trigger Levels for Pavements [Adapted from FCM 2003]

4 Roads has recommended that the weighted average Physical Condition of the Network be a minimum of 70. Figure 9.4 supports that recommendation based on the following analysis.

Using the Inventory Manual methodology, the trigger for pavement rehabilitation is a Structural Adequacy of 14, which is a Physical Condition of 70. From the graph, the average network condition should be higher than the trigger value for network rehabilitation; supporting 4 Roads recommendation that the weighted average Physical Condition be greater than 70.

9.7 Cross Asset Integration and Project Prioritization

Prioritizing projects from a purely asset management perspective is a relatively straightforward exercise, regardless of funding level. Complications arise when the specific needs, commitments of the agency, and priorities of other utilities factor into the decision making process.

The road system is, in reality, a utility corridor. Multiple utilities in both urban and rural roadside environments will present conflicting demands and priorities in advancing projects. The State of the Infrastructure provides ratings that deal strictly with the condition of various factors as they relate to the road section. Those factors have to be considered in conjunction with needs and priorities that may exist for other utilities or pending development. In fact, the condition of other infrastructure within the road allowance may be the key element in the prioritization. For

example, a road rated as a reconstruction project may have a relatively low priority rating, but a trunk storm sewer servicing a greater area may require immediate installation. The priority of the road is then dictated by the other utility, and should be integrated into the capital plan, to best serve all interests.

Less tangible priorities may also be project prioritization tools for some agencies. For example, an agency may want to advance projects that also include bus routes or bike lanes.

As a municipal road program is developed, opportunities to complete work on smaller sections adjacent to the main project, at a lesser cost than if completed as a stand-alone project, should be considered to realize economies of scale, and complete improvements that may otherwise be passed over.

The caveat to this discussion is the requirement of Regulation 588/17 that the overall system condition be maintained.

9.8 Gravel Roads Management Strategy

Niagara-on-the-Lake has a gravel road system of 14.892 centre line kilometres (5.76% of the system, unadjusted for boundary roads). The budget recommendation is approximately $202,600 annually, for the materials only (placed on the site). This would place 75mm (3 inches) every 3 years.

Proper maintenance of a gravel road surface is deceptively expensive. Costs include gravel, dust control, and grading. Frequently, budget analysis proves that the per-kilometre cost of gravel road maintenance is greater than the per-kilometre cost for hard top maintenance. For this reason, conversion of gravel surface roads to hard top roads generally proves to make economic sense and improves user satisfaction.

Road agencies in both Canada and the United States, have conducted studies that have generally indicated that, dependent upon local unit costs, gravel road conversion to hardtop, can be a cost-effective strategy. One source indicates that this may be effective management for roads with traffic volumes as low as 100 AADT.

Appendix D of this report includes additional information on gravel road conversions including a flow chart to illustrate the decision matrix for conversion. Benefits to converting a gravel road include:

- Customer satisfaction
- Reduced maintenance costs for routine maintenance
- Reduced maintenance costs for winter maintenance

Appendix D of this reports identifies a criteria for selection of potential gravel road conversion candidates. Gravel roads were reviewed during the spring break-up. Gravel road conversion to hard top over time is the recommended strategy.

9.8.1 Gravel Resurfacing Program Analysis

Gravel roads can be deceptively expensive to manage and maintain. Gravel roads tend to be the ‘forgotten’ asset. Gravel roads form an integral component of the road asset group for a large number of municipalities and should be managed as any other asset.

Most aspects of municipal service delivery are in fact an asset management decision. The decision whether to surface treat a road, or have the road remain as a gravel surface, is very much an asset management decision.

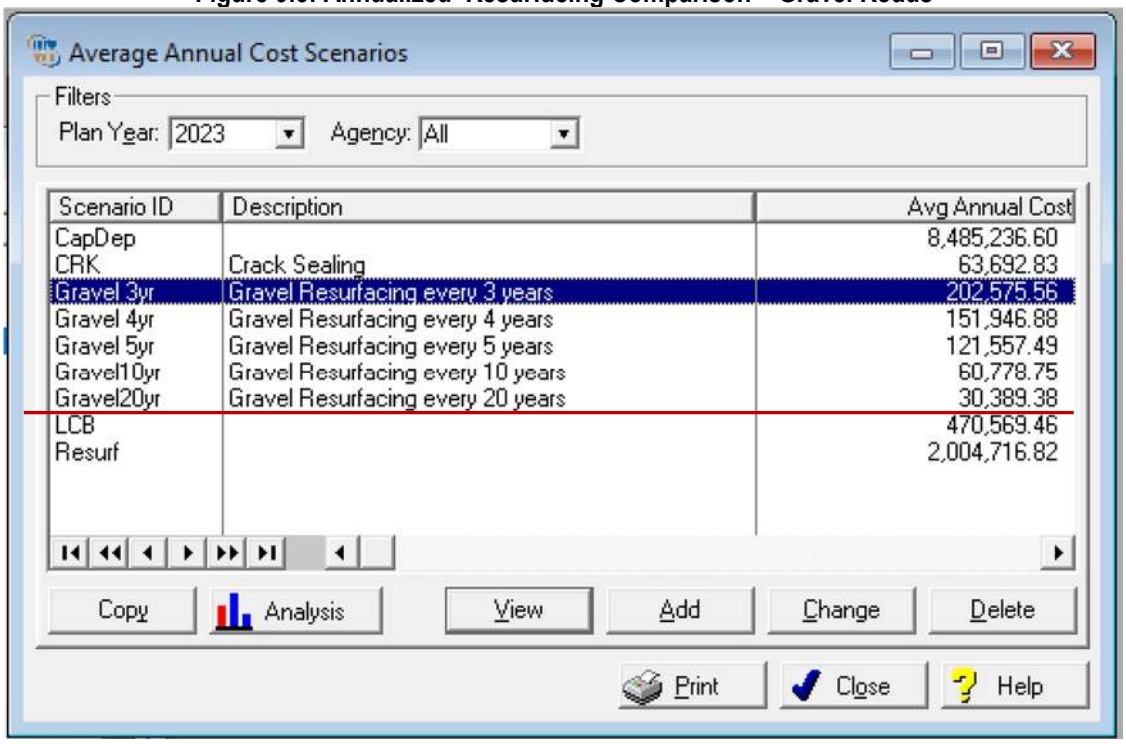
This report provides a recommended annual cost for gravel road maintenance of 75mm additional gravel to be added every three years, and does not include regular grading or dust control costs. The additional 75mm of gravel was a typical standard that was used in the past by many municipalities. Due to the natural life cycle wear and tear,

maintenance, and winter control activities, gravel roads require additional gravel on a regular basis to ensure continuing performance.

One of the difficulties in determining the deterioration of a gravel road is that the wearing surface and the granular layers are one and the same, so the extent of deterioration may not be as obvious until the deterioration is significant. Appropriate gravel road maintenance can be deceptively expensive. Frequently, high level budget analysis proves that the per-kilometre cost of adequate gravel road maintenance is greater than the per-kilometre cost for hard top maintenance. This is further exacerbated as traffic volume on a gravel road increases.

The following screen capture from the software utilized illustrates the point with respect to the cost of gravel road maintenance by showing the calculated annualized replacement costs versus the annualized gravel road resurfacing requirements at intervals of 3, 4,and 5 years.

Figure 9.5: Annualized Resurfacing Comparison – Gravel Roads



The 2023 funding level is approximately 15% of what is required to sustain the gravel road portion of the road system (material costs only) based on the application of 75mm once every 3 years. The funding level provided would appear to be equivalent to the addition of 75mm every 20 years.

The observation from the field data collection was that the gravel is being applied in too thin a lift to be effective. This is supported by the foregoing analysis.

9.8.2 Gravel Road Conversion to Hard Top

Aggregate specifications include many requirements to ensure performance, including gradation. The gradation of aggregates was designed in order that the granular base can support load and drain. Gravel roads become contaminated very quickly after placement of new material due to adjacent business operations tracking material on to the road surface and in some instances even the municipal grading operation may contaminate the material.

The contamination interferes with the granular material's ability to support load and drain. As such, given the cost to maintain a gravel road, it would appear logical that once a gravel road is structurally sound and has clean material placed on the surface, placing a hard top – typically surface treatment- to preserve the investment.

Appendix D of this report provides further information on conversion selection criteria.

10 Program Funding Recommendations

10.1 Overview

Program funding recommendations are a function of the dimensional information, surface type, roadside environment, functional class of the individual assets and current unit costing. Recommended funding for the road system should include sufficient capital expenditures that would allow the replacement of infrastructure as the end of design life is approached, in addition to sufficient funding for maintenance, to ensure that that full life expectancy may be realized.

Budgetary recommendations in this report do not include items related to development and growth; those should be considered as additional. Generally, that type of improvement or expansion to the system would be funded from a different source, such as Development Charges.

The budget recommendations bear a direct relationship to the value of the road system. 4 Roads estimates the cost to replace the road system, to current standards, at **$426,520,900** based on current unit costs and the standardized calculations in the Inventory Manual. The budget recommendations provided in this report are based on the constitution of the road system. This represents an opportunity to develop a financial plan in concert with the asset management plan, for a phased implementation.

10.2 Program Funding Recommendations

10.2.1 Current Replacement Costs and Long Term Sustainability

The estimated replacement value of the Niagara-on-the-Lake road system to the current standard is **$426,520,900** . This equates to an annualized capital replacement of **$8,530,400** based on a 50 year period. This would represent the Long Term Sustainable funding level. (This would be similar to the PSAB 3150 amortization value using current replacement cost instead of historic cost.) The current value of the road system is estimated to be $356,503,000.

The Long Term Sustainability funding level is strictly a function of the replacement cost and the life cycle period and would best be described as an ‘Accountaneering’ number. This estimate does not include bridges, culverts, cross culverts less than 3 m, sidewalks, or street lighting. The typical design life for a road structure has typically been considered to be 50 years before reconstruction/replacement.

However, in an urban setting in particular, with the underground utilities typically having an expected life in the 75 year range, it would seem more pragmatic to match the lifecycles of the road and utility assets. Road assets can be designed to last 75 years with only resurfacing required. Rural cross sections should be treated similarly.

The estimated replacement/depreciation is based upon the replacement value of the road system over a 50-year life cycle. However, the 50-year life cycle can only be a reality if maintenance and preservation treatments such as crack sealing and hot mix asphalt overlays are delivered at the appropriate time. Inadequate maintenance and preservation will result in premature failure and increased life cycle costs.

Analogies to houses and cars sometimes make road maintenance easier to understand. If a house does not have the roof renewed within the correct time frame, there will be damage to the structure, below the roof, and if this is not dealt with, it will result in a rapid deterioration of the house. Similarly, roads require crack sealing and resurfacing at

the appropriate time, during the life cycle, in order to maximize the life expectancy of the asset. Preservation and maintenance extend the useful life of the pavement, reducing life cycle costs.

10.2.2 Hot Mix Resurfacing

Roads require major maintenance throughout the life cycle, in order to optimize and maximize the asset life span. Roads require resurfacing at the appropriate interval, for the respective class of road. Different agencies categorize the expense differently, usually dependent upon the dollar value; however, resurfacing is essentially a maintenance activity.

Resurfacing schedules are dependent upon traffic loading and the percentage of commercial traffic. Higher traffic volumes and percentages of commercial traffic shorten the interval between resurfacings. Optimal resurfacing intervals will vary from ten to twenty years (or more), depending upon the road function, classification, and quality of design and construction.

The Hot Mix Asphalt Resurfacing recommendation in this report is based upon the distribution of NotL's hot mix asphalt inventory. As such, the optimal budget calculation will focus on the 17(17.3)-year interval, for hot mix roads. This would represent an average of 7.1 CL-km of resurfacing annually.

Table 10.1: Hot Mix Asphalt Roads by Asset Class and Life Cycle (unadjusted length)

Asset Class	Life Cycle Yrs	Asset Qty. (CL-km)	Weighted Average (Yrs)
A/C-R	19		
A/C-S	19		
A/C-U	19		
HCB1-R	9		
HCB1-S	9		
HCB1-U	9		
HCB2-R	12		
HCB2-S	12		
HCB2-U	12	0.15	0.0145655
HCB3-R	15	34.81	4.2251983
HCB3-S	15	6.31	0.7659006
HCB3-U	15	11.12	1.349733
HCB4-R	19	6.15	0.9455413
HCB4-S	19	20.79	3.196391
HCB4-U	19	44.25	6.8032853
Totals		**123.58**	**17.300615**

Given the aforementioned, and the information with respect to surface type contained in Table 4.1 the funding for the annual resurfacing program should be **$2,004,400** per year on average, in order to maintain the system at its current adequacy level. This estimate is for the major resurfacing work only and does not include any estimated costs for other pavement preservation activities or programs. Table 10.1 identifies the distribution of hot asphalt roads by asset class and the basis for the recommendation for the annual program budget recommendation.

10.2.3 Crack Sealing

Crack sealing is a preservation activity that extends the life of a hot mix asphalt surface. A program estimate is provided based on crack sealing one metre per two lane metre of pavement every 5 years at the unit cost provided by 4 Roads, that we believe to be representative. Based on that premise, the recommended budget for crack sealing is **$63,700**.

10.2.4 Surface Treatment Resurfacing

Most agencies report that the average life of surface treated road is seven years. Similar to the concept applied to the development of the hot mix resurfacing recommendations, the surface-treated road network should be completely resurfaced every seven years, or approximately 14% (14.8 km)of the surface treated inventory in each calendar year.

At a unit cost of $3.93 per square metre, the annual program size should be **$470,600** on average, exclusive of any other preparatory work.

10.2.5 Gravel Road Resurfacing

When MTO was providing maintenance subsidy, the standard practice for gravel road maintenance was to place approximately 75 mm of gravel on each gravel road section, every three years.

Since the conditional grant system was discontinued, a large number of municipalities have reduced the amount of gravel that has been placed on gravel roads, to the point where the gravel roads in the system are a major maintenance problem, particularly in the latter part of the winter and early spring. If the granular base is not replenished, the road structure will disappear through normal usage, and the remaining gravel typically becomes contaminated by other materials, such as the native soil and winter sand.

Niagara-on-the-Lake has 14.892 km of gravel surfaced roads, as per Table 4.1 of this report (adjusted for boundary roads). Using the Municipality's benchmark costing, the annual gravel resurfacing program size should be **$202,600** per year, based on adding 75 mm of gravel every three years. (This is 75mm across the entire platform.) This estimate does not include costs for re-grading, dust control, or gravel road conversion.

10.3 Short and Long Term Sustainability and the Funding Window Concept

Typically, municipalities, and more particularly public works departments, prepare annual budgets that have specific line items for capital, operational and maintenance expenditures. The definitions for capital and operational costs can vary between municipalities and road authorities.

From a pure asset management perspective, project selection and annual programming should be driven by asset condition, rather than a fixed line item amount. Section 9 of this report, provided a review of this asset management philosophy.

Rather than have a fixed line item for certain activities, 4 Road recommends that all of the major maintenance and rehabilitation and construction activities be considered as **the annual re-investment amount**. Annual expenditures will meet the overall bottom line, however, when projects and programs are driven by condition, the annual line items will vary.

The funding window is the zone between the short and long term sustainability funding recommendations.

The 'funding window' is the range between the Short Term Sustainability and the Long Term Sustainability funding levels. Re-stated, instead of the traditional capital and maintenance line items, consider the gross budget as **the annual reinvestment amount**, with program funding levels fluctuating within the gross amounts, but driven by asset condition.

As an example, if the 'capital' and 'operations' line item limitation were imposed on a municipality that has experienced significant growth, then opportunities to optimize funding will be missed. In municipalities experiencing significant growth, there will be a need for treatments within that development at a similar timeframe. For example, the roads will need to be resurfaced within a year or two of each other. If they are not resurfaced at the appropriate condition, then the condition will deteriorate and improvement will be more expensive. This concept is illustrated in Figure 9.1 and Figure 9.2.

For modeling purposes, 4 Roads has created a funding level described as the 'Short Term Sustainability' or 'Preservation Funding' level which should provide sufficient funding to maintain the condition of the system over a short time frame (less than 10 years)

The Short Term Sustainability is the total of the recommended funding levels for hot mix resurfacing, single surface treatment, gravel road resurfacing and crack sealing: **$2,741,200.** The premise being that if the pavement maintenance, preservation and resurfacing programs are adequately funded, then the system should be sustained over the short term; five to 10 year maximum. The caveat is that the program that is developed through a performance model at this funding level *must* be adhered to strictly, or the system will deteriorate.

The Short Term Sustainability funding and performance model thereof, are computer derived. Intangible values and decisions and the effects of other external forces cannot be incorporated into the model. As such the model is the minimum required to maintain the system- in theory. **Theoretically, the 'Short Term Sustainability' funding level would work. Practically, that would rely on every assumption and rating to absolutely correct, and the program adhered to explicitly.** From a more pragmatic perspective and to deal with the real life realities of maintaining a road system, it should be greater.

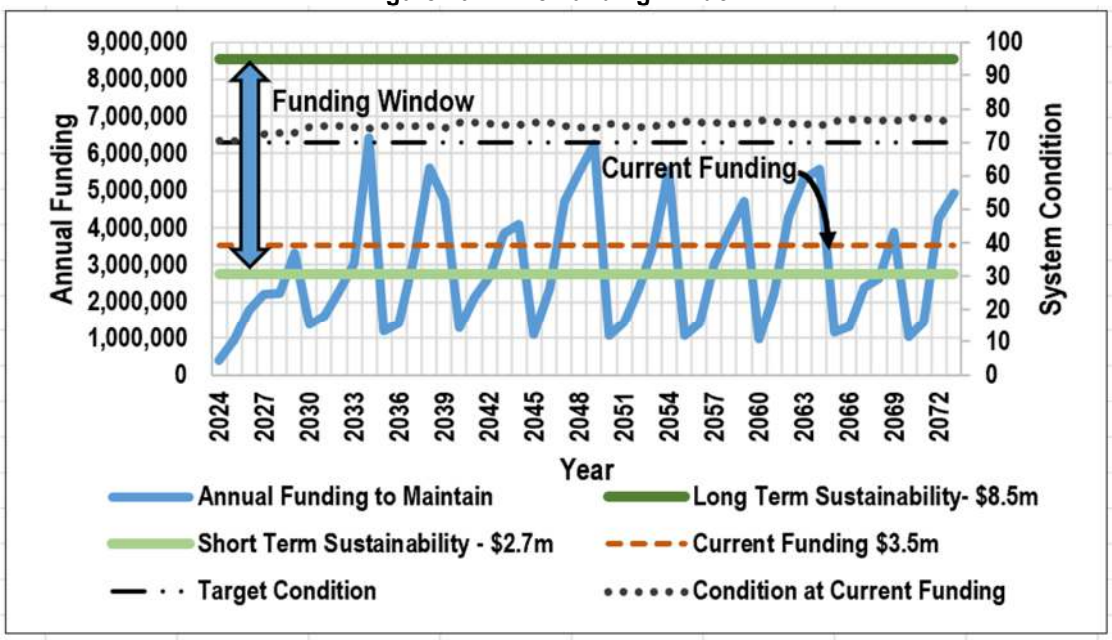
To sustain the road system over the entire life cycle the Long Term Sustainability funding level is required. Performance modeling is discussed in Section 9 of this report. 4 Roads has calculated that the annualized replacement cost -Long Term Sustainability- at **$8,530,400**. In 2023, the gap between short and long term sustainability is significant due to the unit cost increases of earth excavation, and granular materials.

Figure 10.1 depicts the necessity to fund at the long Term Sustainability replacement . The entire amount does not have to be expended each year, but should be placed in a reserve until the demands on the system exist.

Municipal pavement and asset management strategies are critical to managing the performance of the road system, more so, if funding is limited. Funding constraints should push the strategy toward those programs that extend the life cycle of the road by providing the correct treatment at the optimum time as a priority. Resurfacing, rehabilitation, and preservation projects should be a higher priority than reconstruction projects. The objective is to "keep the good roads good".

As the municipality advances the development of their Asset Management Plan (AMP), a paradigm shift will be required in the way that we approach management of assets. Traditionally, municipalities have spent a fixed amount on capital and maintenance each year. As evidenced by Table 11.3, programs are not at a consistent funding level on an annual basis. The annual budget overall is met, however, the distribution of costs between traditional capital and maintenance activities varies. That variance is being driven by the demands of the road system based on condition. Project selection is based on condition and best Return on Investment. This concept can and should be applied to all assets.

Figure 10.1: The Funding Window



In NotL's circumstances, the current funding level is *theoretically* satisfactory in the short term The graph illustrates that – theoretically- the current budget will hold the condition of the system. However, that would only be true if:

- If the anticipated performance of the road assets followed the deterioration curve exactly
- If the work plan developed by the model were adhered to explicitly

For this reason, we typically recommend the funding window with a minimum funding level of the Short Term Sustainability budget as a target for the short term and the Long Term Sustainability funding level over the life cycle. It is recommended that the annual funding level be increased to the Long Term Sustainability Level over the next 10 years, as a minimum.

Once annual funding satisfies the Long Term Stability funding requirement, that annualized amount should be directed to a dedicated reserve for the road assets. Funding for all capital and high level maintenance such as gravel resurfacing, crack sealing etc, should be funded from the reserve as required to maintain the system condition. The entire annual contribution does not have to be expended each year.

10.4 Annual Budget Adjustments

10.4.1 Inflation

The typical approach to annual budget adjustments is to adjust with some reference or consideration to the Consumer Price Index (CPI). Public Works Departments have not fared well with this approach, as a large portion of the Public Works Budget is expended on commodities and services that typically vary/increase at a rate significantly higher than the CPI. Public Works Departments' annual increases based solely on CPI, will generally result in a continual downward spiral in overall condition of the road system and service levels. Decreasing service levels increase risk. Ontario is becoming much more litigious; therefore, the reduction in service levels increases the risk for a municipality, and the cost of service provision versus the cost of litigation should be considered.

In recent years, increases and decreases in fuel, asphalt, and salt have been disproportionate to the CPI. As such, consideration should be given to annual adjustments in road funding, which are more reflective of the actual experience. Some municipalities provide for such disproportionate changes in their budget process, in order that the specific impacts of a commodity price increase and service delivery are considered.

10.4.2 Plant Adjustment (System Changes)

Most municipalities experience development-related growth. Growth comes at a cost, both in the longer-term, with additional resurfacing and replacement requirements, and in the shorter-term, with Operational budgets. Operational budgets should be adjusted on a pro-rata basis to account for the additional length of road that has to be maintained.

Capital budgets and forecasts should also be adjusted annually, to reflect the changes in the system, and integrated into the longer-term financial plan.

11 Performance Modeling- Budget Effect on System Performance

11.1.1 Asset Management Plan Analysis

The asset management plan is a function of the assets, the required life cycle activities and funding. Required funding is driven by the plan and the life cycle activities – not necessarily the current funding level. The development process for all elements is dynamic, iterative, and holistic on a number of levels. It is complex.

From Regulation 588/17;

> *"4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:*
>
> *i. The full lifecycle of the assets.*
>
> *ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.*
>
> *iii. The risks associated with the options referred to in subparagraph ii.*
>
> *iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service."*

A work plan and lifecycle activities – a Performance Model – were developed using WorkTech Asset Management Foundation software (WT6).

Performance models may be developed with as many variables for weighting of attributes that may be included in the database. Models that develop work plans based on a Return on Investment (ROI) scenario produce results in terms of project selection that are consistent with the concepts of asset management and selection of the right treatment at the right time. From available funding, the treatments offering the best ROI are selected as a priority. Those treatments are typically crack sealing, micro paving and resurfacing.

The provincial guidelines for the preparation of an AMP indicate that the following must be considered;

- Options must be compared on Lifecycle cost- the total cost of constructing, maintaining, renewing and operating an infrastructure asset throughout its service life. Future costs must be discounted and inflation must be incorporated.

- Assessment of all other relevant direct and indirect costs and benefits associated with each option.
    - Direct benefits and Costs
        - Efficiencies and network effects
        - Investment scheduling to appropriately time expansion in asset lifecycles
        - Safety
        - Environmental
        - Vulnerability to climate change
    - Indirect Benefits and Costs
        - Municipal wellbeing and costs
        - Amenity values
        - Value of culturally or historically significant sites
        - Municipal image

- Assessment of Risks associated with all potential options. Each option must be evaluated based on its potential risk, using an approach that allows for comparative analysis. Risks associated with each option can be scored based on quantitative measures when reasonable estimates can be made of the probability of the risk event happening and the cost associated with the risk event. Qualitative measures can be used when reasonable estimates of probability and cost associated with the risk event cannot be made.

Significant effort (and expense) will be required to meet all of these requirements.

11.1.2 Performance Model Overview

A properly developed performance model will satisfy the majority of the requirements identified in the foregoing. Key elements of a Performance Model will include;

- Deterioration Curves identifying anticipated deterioration of an appropriately constructed asset over the life cycle of the asset
- 'Trigger' points throughout the deterioration curve identifying appropriate treatments at condition ranges
- Current costing for all treatments identified

To capture the essence of the provincial requirements, development and use of a Performance Model is recommended. Through modeling and the resultant output, the following may be addressed;

- Review of options and lifecycle effects based on a Return on Investment Analysis
- Efficiencies and network effects
- Budget requirements to achieve LOS goals

As noted in section 11.1.1, Regulation 588/17 requires a work program that considers the lifecycle activities of each asset over a 10 year period and results in a program that maintains the average condition of the asset group. The most effective means to achieve this goal is through a performance model. WorkTech Asset Manager Foundation (WT6) includes a performance modeling capability, which has been used to develop the work plan for this project.

Through performance modeling, appropriate budget levels, programming and associated costs can be determined, delivering key elements of any plan that can be refined or revisited as circumstances change. Once a model is developed, then the effect of any alternatives may also be measured.

4 Roads is of the opinion a number of other requirements that the province has identified should not be addressed until they reach the project stage. Further, a number of those requirements would be addressed through a Class Environmental Assessment process.

This particular series of Performance Models is based on the road system in the condition that it exists today in terms of the currents pavement distress information and the current dimensional information. Section 11.4 of this report discusses a 10 year performance model.

11.2 System Performance at Various Budget Levels

This report includes budget recommendations for various aspects of the programming that are typical to road departments. The budget recommendations do not include the expansion program related to growth and development. System performance can be predicted based on the level of funding.

4 Roads has prepared four different 50-year performance models for the road system. The models have been prepared with the following parameters:

- Zero budget – demonstrates the effect of no work being performed on the road system and how quickly it will deteriorate.
- Short Term Sustainability /Preservation budget – $2.74m-This includes the total dollar value of the budget recommendations for Hot Mix Asphalt resurfacing, surface treatment, gravel road resurfacing and crack sealing.
- Current Budget - $3.5m
- Current Budget with Committed Projects – $3.5m
- Long Term Sustainability budget- $8.5m full replacement cost of the road system annualized.

The Average Physical Condition (a Pavement Condition Index – PCI) of the road system is currently 68.67 The performance model calculations all begin with the current Physical Condition and for purposes of the graphing, the year-end Physical Condition is displayed, based on the effects that the improvements have had on the overall condition of the road system.

From Figure 11-1, the performance at the current funding level, appears to hold the average system condition over time.

The model is reliant on anticipated deterioration. If road sections deteriorate more quickly, then the current funding and committed programming is not sufficient to sustain the system.

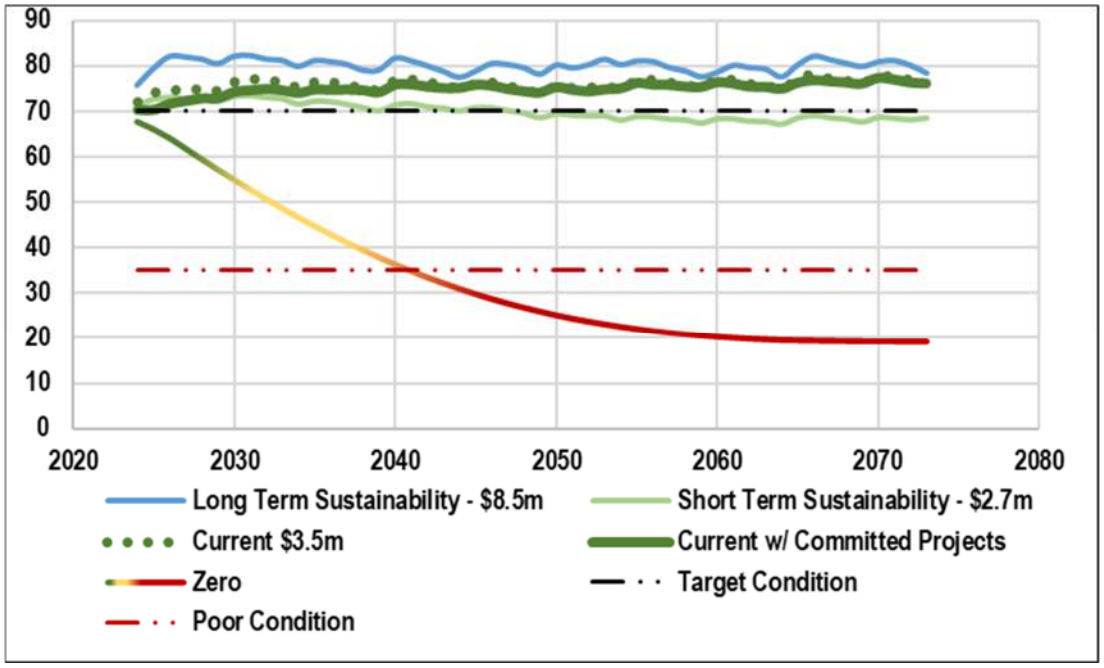
Further, there will be some road sections in poor condition that will not be addressed in the program. This would re-emphasize the need to have a maintenance paving program, over and about the current programming.

In reviewing the results of the performance models, it should be understood that, with the methodology being used, the trigger for a resurfacing activity is a Physical Condition of 70 for hot mix roads. At appropriate funding levels the system condition improves over time.

The effect of a funding level has many measures, not just the performance of the condition of the system.

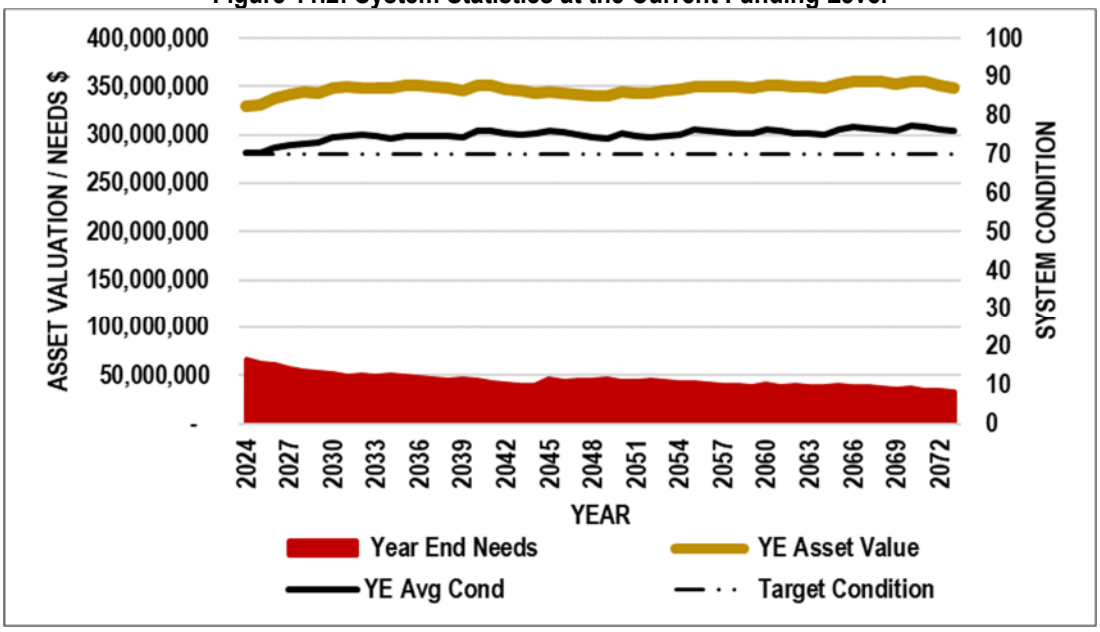
Figure 11.2 illustrates the effect of the current funding level on the average system condition, the value of the road system and the cumulative needs.

Figure 11.1: Performance Modeling at Various Budget Levels



Notes: Short Term Sustainability assumes perpetual performance of the road after initial rehabilitation and is not influenced by other asset demands

Figure 11.2: System Statistics at the Current Funding Level



Notes: The mode assumes perpetual performance of the road after initial rehabilitation and is not influenced by other asset demands

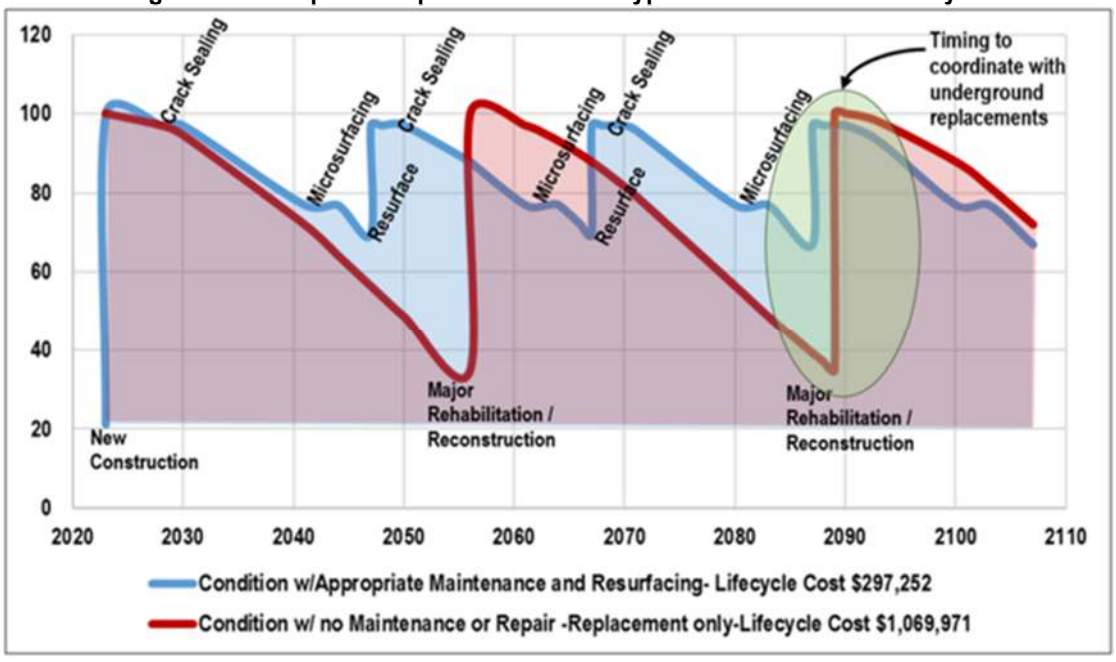
The deterioration curves that have been used consider an average/typical performance for the various road classes. When used in the model at a reasonable funding level the overall average system condition will remain at a similar level as the model will treat the pavements as perpetual. This concept is illustrated in Table 11.1 using NotL Section 5105, Butler Street, 0.1km South of John Street West-to-John Street West.

Table 11.1: Sample Section Life Cycle (from 2023 Study)

Year	Improvement Type	Cost	Asset Start Cond	Asset End Cond	Yrs Hold	Start Value	End Value	ROI
2027	RNS	112644	53.91	100		54,492	101,079	0.44
2032	CRK	260	97	97	2	98,047	98,047	4.43
2048	R1	37489	69.47	94.47		70,220	95,489	0.74
2049	CRK	260	94.47	94.47	2	95,489	95,489	5.36
2063	R1	37489	69.47	94.47		70,220	95,489	0.74
2064	CRK	260	94.47	94.47	2	95,489	95,489	5.36

For the purposes of a short to mid-term plan considering the pavement as performing as a perpetual pavement does not pose a problem. The aggregate road base will deteriorate over time however, the time frame where that may be contributory to the road decline would be beyond 50 years. Condition data is collected regularly and monitoring and analysis would alert the municipality to changes that are occurring.

Figure 11.3: Graphical Representation of a Typical Urban Section Life Cycle

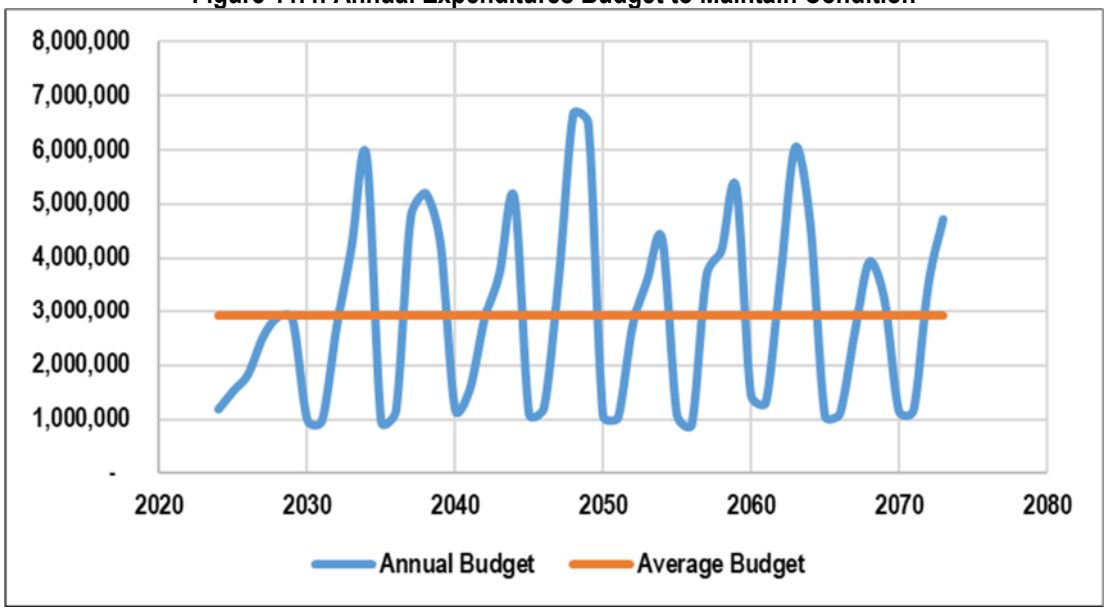


Note: Life cycle with appropriate maintenance includes crack sealing, microsurfacing, resurfacing and reconstruction.
The shaded areas represent the respective areas under the curve; the greater the area the more preferred the life cycle options

Figure 11.3 provides a graphical representation of the two distinctly different approaches to asset management. (Not from the NotL system)The blue line represents a treatment selection based on treatment selection by condition and the best ROI. The Red line represents a road management by reconstructing and then deteriorating to failure and then reconstructing or major rehabilitation. The cost difference is approximately 3 times.

Figure 11.4 illustrates the typical effect on budget requirements by holding the condition of the system at a specified level. If the orange line represented the average annual expense, the budget years above that line would require debt financing or funding from reserves. Conversely, in those years where the funding requirement is less than the annual average then the unspent funds would accumulate in a reserve.

Figure 11.4: Annual Expenditures Budget to Maintain Condition



Deterioration curves developed by 4 Roads have been utilized for development of funding and prediction models and based on our experience with a large cross-section of municipalities and resultant feedback, we believe that those deterioration profiles are representative. The models indicate that the overall condition of the road system will continue to increase over time to a point where the average physical condition will be in the mid 70's range. A physical condition beyond that level may be indicating an over-expenditure/inefficiency in the programming. An average physical condition above 70 would indicate that the average road only requires maintenance.

In a number of the models created for this project, all of the funding will not be spent each year once the average rises above 70. The deterioration curves that have been used consider an average/typical performance for the various road classes.

11.3 Record of Assumptions -Performance Modeling

11.3.1 Pavement Classification for Modeling

In order to develop budget recommendations, 4 Roads adds an additional classification of roads differentiated by surface type, roadside environment and traffic volume. It is anticipated that each road classification will deteriorate at

a different rate. Differentiation by roadside environment within a classification permits calculation of the different replacement costs to reflect the servicing and feature differences.

Table 11.2: Road Asset Classes

Asset Class	Subtype	Material	Roadside Envt	AADT Low	AADT High
A/C	All	A/C	R	1	100,000
CM1	All	C/M	R	1	3,000
CON	All	CON	R	1	100,000
GST1	All	G/S	R	1	10,000
HCB1	All	HCB	R	20,000	100,000
HCB2	All	HCB	R	10,000	19,999
HCB3	All	HCB	R	1,000	9,999
HCB4	All	HCB	R	1	999
ICB	All	ICB	S	1	3,000
LCB1	All	LCB	R	1	2,000

Figure 11.5: Typical Treatment Selection vs. Condition for Hot Mix Asphalt Roads

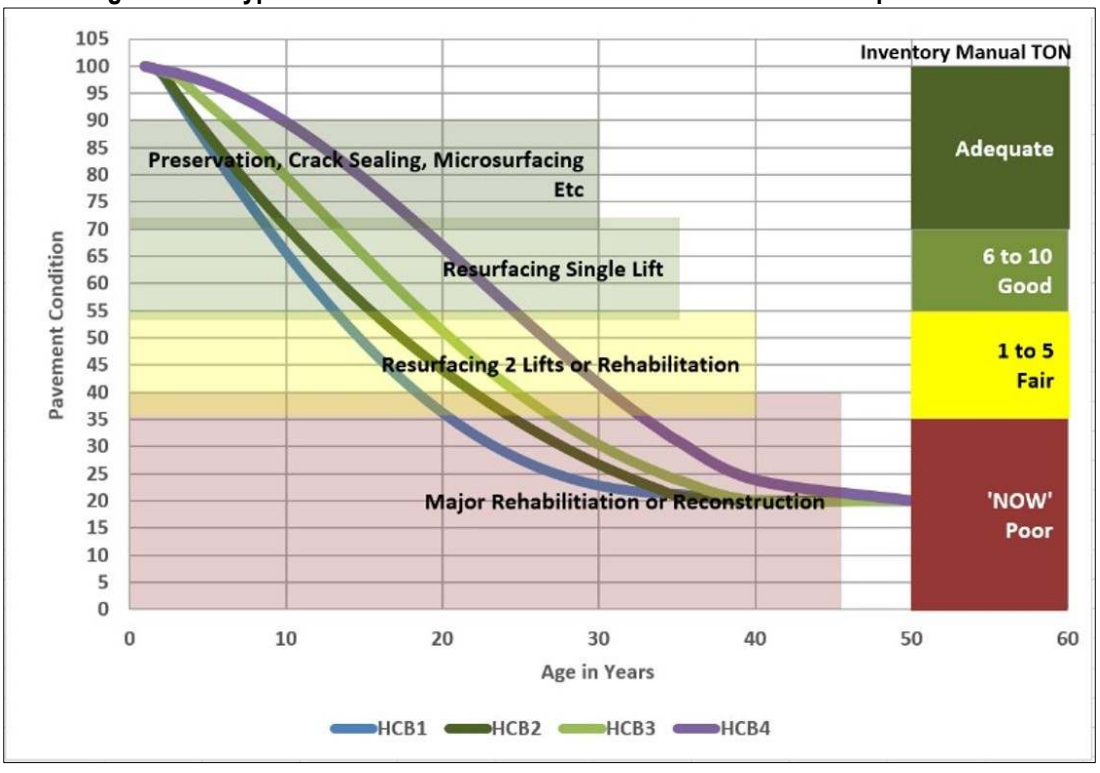


Figure 11.5 illustrates treatment selection by time and asset classes for hot mix roads. Typical treatments and/or improvements have been superimposed over the deterioration curves, to illustrate the general timelines for implementing the treatments. Other road asset classes have been treated similarly. An important concept to

remember is that as a road deteriorates the cost of rehabilitation increases. The deterioration curves, improvement types, current unit costs and current condition ratings are essentially the assumptions used to develop budget and programming recommendations in this report. Appendix C provides detail on the deterioration curves for all road asset classes.

11.4 10 Year Program Performance Model

Appendix G includes the results of a 10 Year program based on the ROI Performance model. The funding is at the current level including committed projects. This performance models will select treatments by condition and best Return on Investment (ROI).

The resultant project selection from the model may vary from the current operational programs and forecast as the model will select projects based on best ROI initially and then expend remaining funds on other projects. The model can be a starting point for program development but has to be metered with decisions than cannot be easily introduced into a model.

The model does not include any new/additional road sections; only work on existing road sections

Table 11.3: Performance Model Summary - 10 Year Program- Current Funding Level with Committed Projects 20231106

Improvement Type	Year										Grand Total
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
BS							660,293	1,211,398	2,242,361		**4,114,052**
CRK	21,536	4,016		78,407	815	11,362	101,115	29,765	31,013	20,465	**298,494**
CRKsd					2,186	5,919	3,376	7,018			**18,499**
DSTrehab			559,711	1,444,730	845,076	268,352					**3,117,869**
GRR									52,416		**52,416**
GRR2					73,361	97,997		426,087	105,134	73,361	**775,940**
MICRO						7,994	66,151	84,019	10,626		**168,790**
PR2	199,670	987,443	2,349,838	710,950	126,331						**4,374,232**
R1	580,000		253,282		581,704	1,769,328	1,450,114	1,570,391	729,528	3,091,678	**10,026,025**
R2			223,949	1,246,068	1,725,431	1,037,598			36,100		**4,269,146**
REC	1,900,000										**1,900,000**
RMrural							80,656				**80,656**
RSS		2,405,501									**2,405,501**
SD		44,493	117,638	41,804	43,967	111,045	11,398	50,101	14,695	1,066	**436,207**
SST	117,519	83,301		2,406	125,728	214,969	1,151,815	145,741	302,175	338,170	**2,481,824**
SST+	85,958										**85,958**
SST++	619,439		20,450								**639,889**
Grand Total	**3,524,122**	**3,524,754**	**3,524,868**	**3,524,365**	**3,524,599**	**3,524,564**	**3,524,918**	**3,524,520**	**3,524,048**	**3,524,740**	**35,245,498**

Note: Performance Model is based on the current funding level and includes committed projects It does not account for expansion project

12 Recommendations

In addition to the budgetary recommendations, the following recommendations are provided for the management of the road inventory.

1. The information and budget recommendations included in this report be used to further develop the corporate Asset Management Planning.
2. A separate funding source/reserve should be created for the road assets.
3. The funding level should be increased to the Long Term Sustainability funding level over a 10 year period.
4. Funding levels should be adjusted annually to accommodate growth / system expansion.
5. Funding should be adjusted annually to accommodate inflation.
6. The work plan should
    - Ensure that the preservation and resurfacing programs are optimized. This is particularly critical for those sections that are not going to be affected by upgrade due to development demands.
    - The work plan should cross integrate assets.
    - The work plan should be followed to optimize investments and performance of the road system.
7. The road system inspection interval should be no greater than 2 years. (See page 34 of the report)
8. Niagara-on-the-Lake traffic counts should continue to be updated and repeated on a regular basis. The counting should include the percentage of truck traffic.
9. A Roadside Safety Audit should be undertaken to assess the potential safety requirements on rural road sections with potentially substandard alignment.
10. The status of the Boundary Road Agreements should be reviewed.
11. The Level of Service for System Adequacy should be a Minimum of 70%.
12. The Level of Service for Average Condition should be a minimum of 70.
13. The Level of Service for Good to Very Good Roads should be a minimum of 60%.
14. The Quality Assurance Program should be reviewed and refined.
15. Consideration should be given to the development of a maintenance paving program for those roads sections that are in poor condition that will not be addressed in the shorter term programming.
16. Develop a corporate asset management system throughout the organization with the development of a Standard Operating Procedure (SOP) for asset management.
17. Consideration should be given to development of the storm sewer system as a rate supported utility.
18. Consideration should be given to development of Master Drainage Plans for all built up areas
19. Improve the understanding of the evaluation systems being used for various assets.

Appendix A: Inventory Manual Methodology Overview

Asset Condition Rating Methodology
The Inventory Manual for Municipal Roads

Regulatory Requirements in Ontario

Regulation 588/17 Asset Management Planning for Municipal Infrastructure requires;

> '*v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.'*

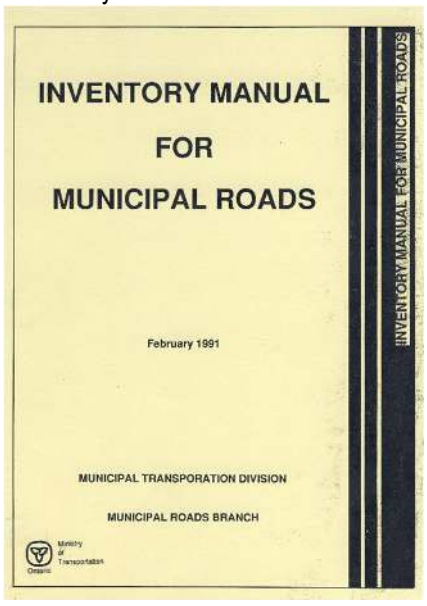
Data collection and road ratings were completed generally in accordance with the Ministry of Transportation Ontario (MTO) *Inventory Manual for Municipal Roads* from 1991. (*Inventory Manual or IM*). The ratings are either a standalone value or incorporated into calculations performed by the software. The ratings or calculations then classify the road section as a 'NOW', '1 to 5', or '6 to 10' year need for maintenance, rehabilitation or reconstruction in six critical areas.

Inventory Manual History

From the 1960's until the mid-1990's, the Ministry of Transportation (MTO) required municipalities to regularly update the condition ratings of their road systems in a number of key areas. The process was originally created by the MTO as a means to distribute conditional funding between municipalities, on an equitable basis. The reports were referred to as a 'Road Need Study' (RNS) and were required in order to receive a conditional grant to subsidize municipal road programs. After the introduction in the 1960's by the MTO, the methodology evolved into the current format by the late 1970's. The most current version of the Inventory Manual is dated 1991, and is the methodology used for this report and supported by WorkTech Asset Manager Foundation Software. The practice was discontinued by a number of municipalities when conditional funding for roads was eliminated in the mid 1990's.

Inventory Manual Overview

The Inventory Manual Methodology is a sound, consistent, asset management practice that still works well today, and in view of the increasing demands on efficiency and asset management, represents a sound road asset inventorying and management system. Road system reviews should be repeated on a cyclical basis. The road section review identifies the condition of each road asset by its time of need and recommended rehabilitation treatment.



In addition to condition ratings, the Inventory Manual also provides guidance in terms of data fields that should be included in a road system database in order to make comprehensive decisions with respect to improvements. There is more to an improvement recommendation than just condition.

To put terminology in a more current context, the past Road Needs Study is now *'The State of the Infrastructure Report (SotI)'.* The SotI analyzes and summarizes the road system survey data collected (or provided) and provides an overview of the overall condition of the road system by road section, including such factors as structural adequacy, drainage, and surface condition. The study also provides an indication of apparent deficiencies in horizontal, and vertical alignment elements, as per the Ministry of Transportation's manual, "Geometric Design Standards for Ontario Highways".

The report provides an overview of the physical and financial needs of the road system, which may be used for programming and budgeting. However, once a road section reaches the project design stage, further detailed review, investigation, and design will be required to address the specific requirements of the project.

Asset Condition Rating Methodology
The Inventory Manual for Municipal Roads

Asset Management by its' very nature is holistic. Managing a road network based solely on pavement condition would be critically deficient in scope in terms of the information required to make an informed decision as to the improvements required on a road section.

The *Inventory Manual* offers a holistic review of each road section, developing a Time of Need (TON) or an Adequate rating in six areas that are critical to municipal decision making:

- Geometrics
- Surface Type
- Surface Width
- Capacity
- Structural Adequacy
- Drainage

Evaluations of each road section were completed generally in accordance with the MTO's *Inventory Manual for Municipal Roads* (1991). Data collected was entered directly into WorkTech's Asset Manager Foundation software. Condition ratings, Time of Need, Priority Ratings, and associated costs were then calculated by the software, in accordance with the *Inventory Manual*. Unit costs for construction are typically provided by municipal staff.

Road sections should be reasonably consistent throughout their length, according to roadside environment, surface type, condition, cross section, speed limit, or a combination of these factors. As an example, section changes should occur as surface type, surface condition, cross-section, or speed limit changes.

Field data is obtained through a visual examination of the road system and includes: structural adequacy, level of service, maintenance demand, horizontal and vertical alignment, surface and shoulder width, surface condition, and drainage. The Condition Rating is calculated based upon a combination of other calculations and data.

The Condition Ratings, developed through the scoring in the *Inventory Manual*, classify roads as 'NOW', '1 to 5', or '6 to 10' year needs for reconstruction. **The Time of Need is a prediction of the time until the road requires reconstruction, *not the time frame until action is required***. It is in essence, a prediction model. For example, a road may be categorized as a '6 to 10' year need with a resurfacing recommendation. This road should be resurfaced as soon as possible, to raise the condition, and to further defer the need to reconstruct. Graph 1 provides a graphical explanation.

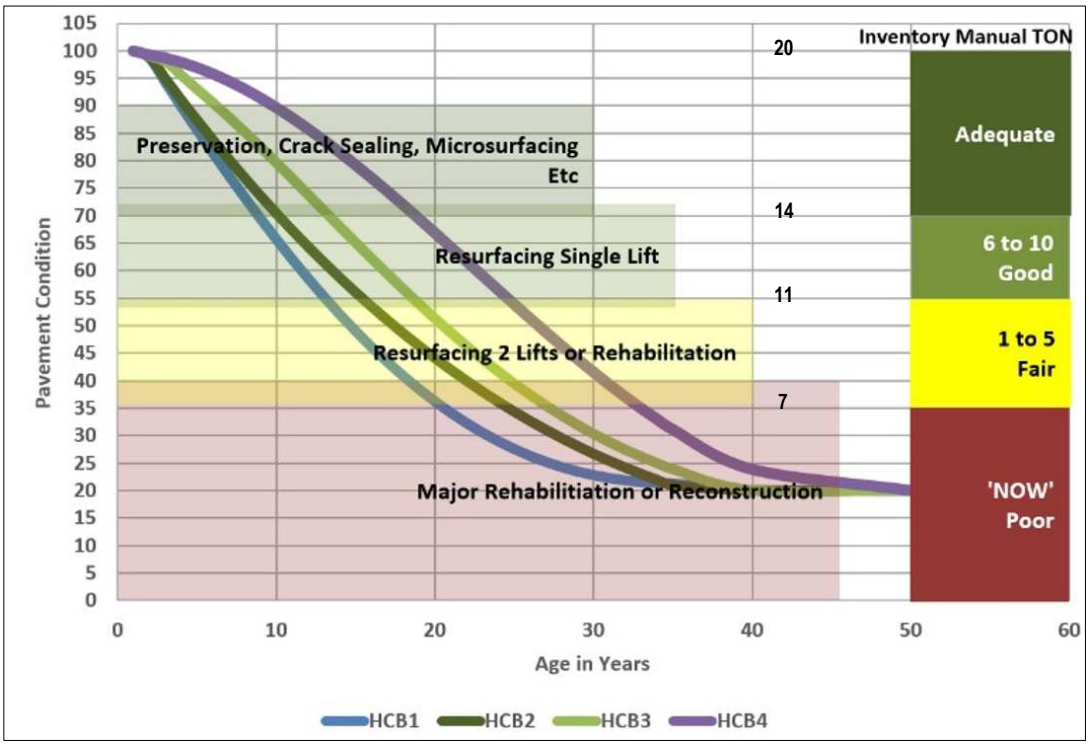
To best utilize the database information and modern asset management concepts, it has to be understood that the Time of Need (TON) ratings are the estimated time before the road would require reconstruction. NOW needs are still roads that require reconstruction; however, it is not intended that '1 to 5' and '6 to 10' year needs are to be acted on in that timeframe for resurfacing recommendations. The '1 to 5' and '6 to 10' year needs are current candidates for resurfacing treatments that will elevate their structural status to 'ADEQ', and offer the greatest return on investment for a road authority (notwithstanding a drainage or capacity need, etc.).

O.Reg 588/17 also requires Level of Service measures for hard topped roads by Pavement Condition Index (PCI). By definition, a PCI is a rating of the road condition between 1 and 100. (ASTM 6433). O.Reg 588/17 is non specific as to the PCI methodology. This is discussed in further detail in Appendix C.

The structural or distress rating in the Inventory Manual has a maximum score of 20, which can be a bit more difficult to relate to than a 1 to 10 or 1 to 100 rating. For the purposes of Graph 1, the Structural Adequacy rating (distress) has been multiplied by 5 to produce a rating on a 1 to 100 scale which may be more readily understood.

When the Structural Adequacy rating is depicted as a 1 to 100 rating, and shown graphically, it is obvious that even given the vintage of the origins of the Inventory Manual (late 1970's), the pavement management concepts of the Ministry of Transportation were well evolved even at that time. Graph 1 is very much in keeping with what are considered to be modern pavement management concepts.

Graph 1: Time of Need vs. Typical Improvement For Hot Mix Asphalt Surface



'NOW' Needs

'NOW' needs represent the backlog of work required on the road system. A 'NOW' need is not necessarily the highest priority from asset management or return on investment perspectives. Construction improvements identified within this time period are representative of roads that have little or no service life left and are in poor condition. Theoretically a resurfacing strategy is never a 'NOW' need, with the exceptions of a PR1 or PR2 treatment recommendation (Pulverize and resurface one or two lifts of asphalt) and where the surface type is inadequate for the traffic volume.

If a road with an improvement recommendation of "resurface" deteriorates too far, it becomes a 'NOW' construction need. A 'NOW' need rating may be triggered by substandard ratings in any of the Structural Adequacy, Surface Type, Surface Width, Capacity, Drainage, or Geometrics data fields.

These roads would be described as being on 'Poor' condition and exhibit distress over greater than 20% of the surface area of the section.

'1 to 5' Year Needs

'1 to 5' Identifies road sections where reconstruction is anticipated within the next five years, based upon a review of their current condition. These roads can be good candidates for resurfacing treatments that would extend the life of the road (depending on any other deficiencies), thus deferring the need to reconstruct.

These roads would be described as being in 'Fair' condition and exhibit distress over 15% to 20% of the surface area of the section.

'6 to 10' Year Needs

'6 to 10' Identifies road sections where reconstruction improvements are anticipated within six to ten years, based upon a review of their current condition. These roads can be good candidates for resurfacing treatments that would extend the life of the road (depending on any other deficiencies), thus deferring the need to reconstruct.

These roads would be described as being in 'Good' condition and exhibit distress over 10% to 15% of the surface area of the section.

Needs with a 1 to 5, or 6 to 10 year, 'Time of Need' rating are prime candidates for resurfacing or rehabilitation treatments and should be acted on in the very near future.

The 1 to 5 and 6 to 10 year 'Time of Need' ratings may be misleading without adding some context to the discussion. This is a prediction of the time to when reconstruction would be anticipated, if no action is taken, not the time to act on the current recommendation.

ADEQ'

An ***'ADEQ'*** rating encompasses a wide range of conditions that include the following:

- Roads with a traffic volume of less than 50 vehicles per day will be deemed adequate, and deficiencies on those roads are to be corrected with the maintenance budgets
- Gravel Roads with a structural adequacy rating that is not a 'NOW' need (more than 25% distress) is adequate; there is no further differentiation by time period
- Roads that do not require improvement other than maintenance and exhibit distress over 0% to 10% of the surface area of the section.

These roads would be described as being in good to excellent condition, with the potential exception the ADEQ rating of roads with less than 50 AADT. Roads with less than 50 AADT may be ADEQ but be in poor condition

INVENTORY MANUAL TREATMENTS

Table A.1: Road Improvement Types

Inventory Manual Improvements	
Code	**Description**
R1	Basic Resurfacing
R2	Basic Resurfacing – Double Lift
RM	Major Resurfacing – removes existing asphalt and replace with existing plus and additional lift.
PR1	Pulverizing and Resurfacing – Single Lift
PR2	Pulverizing and Resurfacing – Double Lift
BS	Tolerable standard for lower volume roads: – Rural and Semi-Urban Cross sections only. Improves drainage and adds structure (granular base) and a surface but not to a reconstruct standard. Typically specified where width is to an acceptable standard.
RW	Resurface and Widen- adds additional lanes and resurfaces the entire road
REC	Reconstruction
RNS	Reconstruction Nominal Storm Sewers (Urban: no new sewer, adjust manholes, catch basins, add sub-drain, remove and replace curb and gutter, granular, and hot mix)
RSS	Reconstruction including Installation of Storm Sewers (New storm sewers, and manholes in addition to the above)
NC	Proposed Road Construction
SRR	Storm Sewer Installation and Road Reinstatement
SD	Spot Drainage
SR	Spot Road
SI	Spot Intersection

Inventory Manual Improvements	
Code	**Description**
CO	Carry Over project
Additional Treatments*	
CRK	Crack sealing
CRKsd	Crack Sealing and Spot Drainage
DST	Double Surface Treatment. Typically specified where it appears that the gravel road surface is adequate and may be a converted to a hard top surface.
DSTrehab	Pulverize and existing surface treated road, add 75mm of gravel, double surface treat, and spot drainage improvements. Typically specified where the road appears to be structurally sound but the surface treatment is deteriorated beyond the point where it should not be re surface treated,
DSTrehab2	In addition to DSTrehab components, base stabilization with magnesium chloride and fog seal over the DST
Fog Seal	Thin spray of bituminous material over surface treated roads to reduce aggregate loss
GRR	Gravel road resurfacing 75mm
GRRsd	Gravel road resurfacing 75mm and spot drainage
GRR2	Gravel road resurfacing 150mm
GRRsd	Gravel road resurfacing 150mm and Spot Drainage
MICRO	Microsurfacing
Slurry	Slurry Seal
SST	Single Surface Treatment
SSTsd	Single Surface Treatment and spot drainage
R2Urehab	Urban resurfacing with 2 lifts, CB and MH adjustments (Very similar to R2 in an urban environment.)

Additional Improvement Types developed by 4 Roads not included in the Inventory Manual

Inventory Manual Improvement Types

For each Type of Improvement **(Item 104)**, there are a number of specific road improvements that are included in the total cost relative to the Roadside Environment **(Item 32)** and the Design Class **(Item 105)**. The computer will check a number of Items on the appraisal sheet in order to select the appropriate factors and cross section standards and then calculate the Bench Mark Cost. For example, a Resurfacing and Widening improvement coded under Item 104 is a significantly different road cross section and cost when applied to a rural road vs. an urban arterial. The computer will make all of the necessary checks to arrive at the recommended improvement cost.

Described in the following pages are the road improvements and associated construction activities costed for each Type of Improvement listed under Item 104. Please note, that the Codes **(CO)** – Carry Over, **(SR)** – Spot Road, **(SI)** – Spot Intersection and **(SD)** – Spot Drainage are direct cost inputs and **are not** included in the Bench Mark Cost system.

(R1) - BASIC RESURFACING

(Single Lift of Hot Mix – 50 mm)

Rural and Semi-Urban Roads (Cross Section A)

(a) Hot mix padding for 20% of area to be resurfaced
(b) Single life of hot mix (50 mm)
(c) Granular material to raise shoulders to new surface grade

Urban Roads – Granular Base (Cross Section B-1)
– Concrete Base (Cross Section C-1)

(a) Minor base repairs for 10% of area to be resurfaced
(b) Hot mix padding for 20% of area to be resurfaced
(c) Curb removal and replacement on both sides for 50% of section length
(d) Planning 1.0m of existing pavement along both curbs
(e) Adjust manholes and catch basins to new surface grade
(f) Single lift of hot mix (50 mm)

(R2) - BASIC RESURFACING

(Double Lift of Hot Mix – 100 mm)

Rural and Semi-Urban Roads (Cross Section A)

(a) Hot mix padding for 20% of area to be resurfaced
(b) Double lift of hot mix (100 mm)
(c) Granular materials to raise shoulder to new surface grade

Urban Roads – Granular Base (Cross Section B-1)
– Concrete Base (Cross Section C-1)

(a) Minor base repairs for 10% of area to be resurfaced
(b) Hot mix padding for 20% of area to be resurfaced
(c) Curb removal and replacement on both sides for 50% of section length
(d) Planning 1.0 m of existing pavement along both curbs
(e) Adjust manholes and catch basins to new surface grade
(f) Double lift of hot mix (100 mm)

(RM) - MAJOR RESURFACING

(Double Lift of Hot Mix – 100 mm)

Urban Roads (Arterials and Collectors) – Granular Base (Cross Section B-1)
– Concrete Base (Cross Section C-1)

(a) Base repairs for 50% of area to be resurfaced
(b) Planning for 50% of area to be resurfaced
(c) Curb removal and replacement on both sides for 50% of section length
(d) Adjust manholes and catch basins to new surface grade
(e) Double lift of hot mix (100 mm)

(PR1) - PULVERIZING AND RESURFACING

(Single lift of Hot Mix – 50 mm)

Rural Roads (Cross Section A)

(a) Pulverize existing hard top surface
(b) Single lift of hot mix (50 mm)
(c) Granular material to raise shoulders to new surface grade

(**PR2) - PULVERIZING AND RESURFACING (Double Lift of Hot Mix – 100 mm**)

Rural Roads (Cross Section A)

(a) Pulverize existing hard top surface
(b) Double lift of hot mix (100 mm)
(c) Granular material to raise shoulders to new surface grade

(BS) - BASE AND SURFACE

Rural Roads – Tolerable Standard (50 to 100 AADT) (Cross Section D)

(a) Granular material for base
(b) Granular material for loose top surface
(c) Minimal shoulder widening
(d) Minor Ditching

Rural Roads – Design Standard (200 to 399 AADT) (Cross Section D)

(a) Placing granular material
(b) Minimal shoulder widening
(c) Double surface treatment
(d) Minor ditching

Rural Roads – Design Standard (400 plus AADT) (Cross Section D) and Semi-Urban Roads – Design Standard (Cross Section D)

(a) Placing granular material
(b) Minimal shoulder widening
(c) Hot mix (50/100 mm, see table F-1)
(d) Minor ditching

(RW) - RESURFACE AND WIDEN

Rural Roads – Tolerable Standard (50 to 199 AADT) (Cross Section E)

(a) Excavating for widening
(b) Ditching and side culvert replacement
(c) Granular material for widening base
(d) Granular material for loose top surface

Rural Roads – Design Standard (200 to 399 AADT) (Cross Section E)

(a) Excavating for widening
(b) Ditching and side culvert replacement
(c) Granular material for widening base
(d) Double surface treatment

Rural Road – Design Standard (400 plus AADT) (Cross Section E) and Semi-Urban Roads – Design Standard (Cross Section E)

(a) Excavating for widening
(b) Ditching and side culvert replacement
(c) Granular material for widening base
(d) Base Course of hot mix for widening
(e) Hot mix Padding for 20% of existing surface area
(f) Single life of hot mix (50 mm)

Urban Roads – Design Standard – Granular Base (Cross Section F)

(a) Excavating for widening
(b) Curb and Gutter removal
(c) Catch Basin removal
(d) Base repair 10% of existing surface area
(e) Granular material for widening
(f) Place catch basins and leads
(g) New curb and gutter
(h) New sub-drains
(i) Base course of hot mix for widening
(j) Hot mix padding for 20% of existing surface area
(k) Adjust manholes to new surface grade
(l) Single lift of hot mix (50 mm) curb to curb

Urban Roads – Design Standard – Concrete Base (Cross section G)

(a) Excavating for widening
(b) Curb and gutter removal
(c) Catch basin removal
(d) Base repair for 10% of existing surface area
(e) Place new catch basins and leads
(f) Granular material for widening
(g) Concrete base for widening
(h) New curb and gutter
(i) New subdrains
(j) Base course of hot mix for widening
(k) Hot mix padding for 20% of existing surface area
(l) Adjust manholes to new surface grade
(m) Single lift of hot mix (50 mm) curb to curb

(REC) - RECONSTRUCTION (RURAL and SEMI-URBAN)

Rural Roads – Design Standard (200 to 399 AADT) (Cross Section H)

(a) Excavate base material
(b) Ditching and side culvert replacement
(c) Grading
(d) Granular material
(e) Double surface treatment

Rural Roads – Design Standard (400 plus AADT) Cross Section H
and
Semi-Urban Roads – Design Standard (Cross Section H)

(a) Excavate base material
(b) Ditching and side culvert replacement
(c) Grading
(d) Granular material
(e) Hot mix (50/100 mm, see Table F-1)

Rural and Semi-Urban Roads – Design Standard (Concrete Surface)
(Cross Section P)

(a) Excavate base material
(b) Ditching and side culvert replacement
(c) Grading
(d) Granular Material
(e) Concrete base and surface

(RNS) - RECONSTRUCTION NOMINAL STORM SEWERS (URBAN)

Urban Roads – Design Standard – Granular Base (Cross Section I)

(a) Excavate base material
(b) Curb and gutter removal
(c) Granular base
(d) New curb and gutter
(e) New sub-drains
(f) Adjust manholes and catch basins
(g) Hot mix (50/100 mm, see Table F-1)

Urban Roads – Design Standard – Concrete Base (Cross Section J)

(a) Excavate base material
(b) Curb and gutter removal
(c) Granular base
(d) Concrete base
(e) New curb and gutter
(f) New sub-drains
(g) Adjust manholes and catch basins
(h) Hot mix (50/100 mm, see Table H-5)

Urban Roads – Design Standard – Concrete Surface (Cross Section O)

(a) Excavate base material
(b) Curb and gutter removal
(c) Granular base
(d) Concrete base and surface
(e) New curb and gutter
(f) New sub-drains
(g) Adjust manholes and catch basins

(RSS) - RECONSTRUCTION INCLUDING INSTALLATION OF STORM SEWERS

Urban Roads – Design Standard – Granular Base (Cross Section K)

(a) Excavate base material
(b) Curb and gutter removal
(c) Storm sewer removal
(d) Manhole and Catch Basin removal including leads
(e) New storm sewers
(f) New manhole and catch basins including leads
(g) New curb and gutter
(h) New sub-drains
(i) Granular base
(j) Hot mix (100/150 mm, see Table F-1

Urban Roads – Design Standard – Concrete Base (Cross Section L)

(a) Excavate base material
(b) Curb and gutter removal
(c) Storm sewer removal
(d) Manhole and Catch Basin removal including leads
(e) New storm sewers
(f) New manhole and catch basins including leads
(g) New curb and gutter
(h) New sub-drains
(i) Granular base
(j) Concrete base
(k) Hot mix (50/100 mm, see Table F-1)

Urban Roads – Design Standard – Concrete Surface (Cross Section Q)

(a) Excavate base material
(b) Curb and gutter removal
(c) Storm sewer removal
(d) Manhole and Catch Basin removal including leads
(e) New storm sewers
(f) New manhole and catch basins including leads
(g) New curb and gutter
(h) New sub-drains
(i) Granular base
(j) Concrete base and surface

(NC) - PROPOSED ROAD CONSTRUCTION

Rural Roads – Design Standard (200 – 399 AADT) (Cross Section H)

(a) Grading
(b) Ditching and cross culverts
(c) Granular base
(d) Double surface treatment

Rural Roads – Design Standard (400 plus AADT) (Cross Section H)

(a) Grading
(b) Ditching and cross culverts
(c) Granular base
(d) Hot mix (50.100 mm, see Table F-1)

Semi-Urban Roads

New Construction does not apply to semi-urban roads as there is no existing frontage development.

Urban Roads – Design Standard – Granular Base (Cross Section K)

(a) Grading
(b) Storm Sewers
(c) Manholes and catch basins including leads
(d) Curb and gutter
(e) Sub-drains
(f) Granular base
(g) Hot mix (100 mm/150 mm, see Table F-1)

Urban Roads – Design Standard – Concrete Base (Cross Section L)

(a) Grading
(b) Storm Sewers
(c) Manholes and catch basins including leads
(d) Curb and gutter
(e) Sub-drains
(f) Granular base
(g) Concrete base
(h) Hot mix (50 mm/100 mm , see Table F-1)

(SRR) - STORM SEWER INSTALLATION AND ROAD REINSTATEMENT (URBAN AND SEMI-URBAN)

Urban and Semi-Urban Roads – Granular Base (Cross Section M)

(a) Trenching and removal of existing storm sewers
(b) New manholes and adjust catch basin leads
(c) New storm sewer including bedding
(d) Granular materials in trench
(e) Hot mix to restore surface grade (100/150 mm, see Table F-1)

Urban and Semi-Urban Roads – Concrete Base (Cross Section N)

(a) Trenching and removal of existing storm sewers
(b) New manholes and adjust catch basin leads
(c) New storm sewers including bedding
(d) Granular material in trench
(e) Concrete base for trenched area
(f) Hot mix to restore surface grade (50/100 mm, See Table F-1)

Urban and Semi-Urban Roads – Concrete Surface (Cross Section R)

(a) Trenching and removal of existing storm sewers
(b) New manholes and adjust catch basin leads
(c) New storm sewers including bedding
(d) Granular material in trench
(e) Concrete base and surface for trenched area

(MICRO) SINGLE LIFT OF MICROSURFACING

Urban, Semi-Urban and Rural Roads with a HCB (High Class Bituminous) surface type

(a) Unit cost per square metre of Microsurfacing

(SST) SINGLE LIFT OF SURFACE TREATMENT

Urban, Semi-Urban and Rural Roads with a LCB (Low Class Bituminous) surface type

(a) Unit cost per square metre of Single Surface Treatment

(SSTplus) SINGLE LIFT OF SURFACE TREATMENT, GEOMETRIC CORRECTION DITCHING IMPROVEMENTS

Semi-Urban and Rural Roads with a LCB (Low Class Bituminous) surface type

(a) Unit cost per square metre of Single Surface Treatment
(b) 20% Surface area padding to 50mm to correct geometric deficiencies
(c) Earth Excavation allowance to provide for minor ditch improvements and berm removal

(DST) DOUBLE LIFT OF SURFACE TREATMENT

Urban, Semi-Urban and Rural Roads with a LCB (Low Class Bituminous) surface type

(a) Unit cost per square metre of Double Surface Treatment

Appendix B: Pavement Structure and Defects

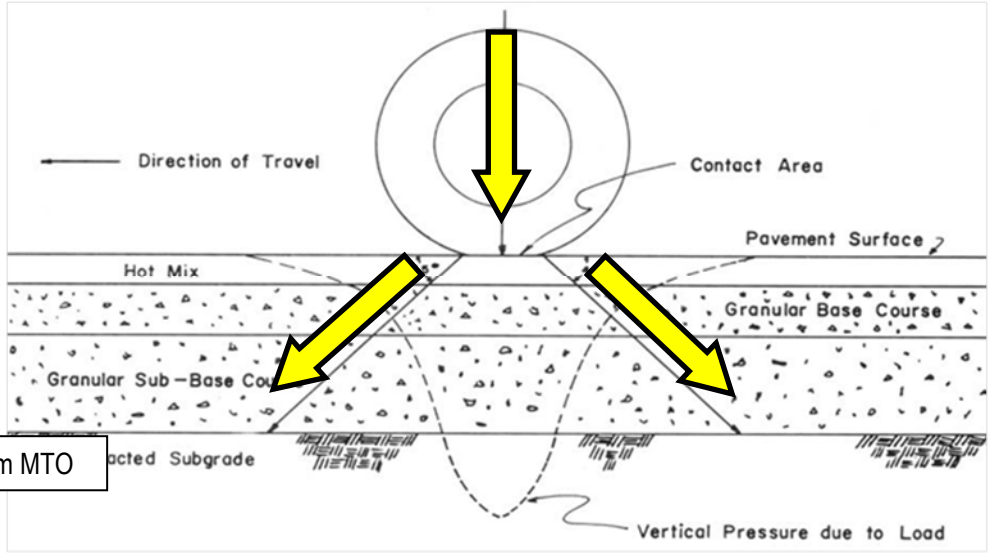
Pavement Structure and Defects

To assist in understanding the content and methodology and recommendations of the report, the following discussion provides an overview of how flexible and rigid pavement structures are designed and function. The majority of municipal roads would be described as having a flexible pavement structure. Hot mix asphalt, surface treatment, and gravel road surfaces are typical flexible pavement road structures. Other pavement structure types include rigid and composite, and are more typically found on 400 series highways, or on arterial roads of larger urban centres.

Flexible Pavement Road Structure

Load is applied to the pavement structure, and ultimately to the native sub-grade, via wheel loads of vehicles. The pavement structure between the native sub-grade and the load application point has to be designed such that the load that is transmitted to the sub-grade is not greater than the sub-grade's ability to support the load. The figure below shows a typical flexible pavement structure and how applied load dissipates.

Figure 1: Load Distribution though Pavement Structure



From MTO

Table 1: Stress vs Depth

Depth Below Surface	Stress (psi)	Stress (Kpa)
At Surface	90	620.50
8" (200 mm) Below	11	75.84
11" (275 mm) Below	7	48.26
16" (400 mm) Below	4	27.58

If the road structure is insufficient to support the imposed load, then dependent on the sufficiency of the native soil, the soil may deform and migrate into the granular base. The granular base is then contaminated -from a geotechnical perspective- and will have reduced capacity to support load.

Surface materials experience the highest loading at the point of contact with the vehicle's tire. Radial truck tires, running from 110 psi to 120 psi (760 kpa to 830 kpa), can have an impact 20 times higher at the surface, than at the

compacted sub-grade, as shown in the above table. The loading actually occurs in three dimensions, in a conical fashion, dissipating both vertically and horizontally as it passes through the pavement structure. Loading decreases exponentially as it passes through the road structure. Therefore, materials of lesser strength, or lesser quality, may be used deeper in the road structure.

As a rule of thumb, the closer the road building materials are placed to the surface of the road, the higher the quality of the material required. Similarly, the poorer the sub-grade, or native material, the deeper/stronger the road structure has to be to carry the same loads.

Traffic counts, particularly the percentage of trucks, are critical to structural design of the pavement. Pavements are designed based on the estimated number of Equivalent Single Axle Loads (ESAL's) over the design period. One ESAL is 8 tonnes, or 80 kN. Depending upon the source, the effect of a single EASL on the pavement structure can be equivalent of up to 12,000 passenger cars. The effect of farm machinery would be very similar to that of heavy trucks. However, the Highway Traffic Act does permit certain types of farm machinery and equipment to use the roads, even during half load season, so this is an additional consideration when designing road structure and particularly low volume rural roads with farm equipment.

Figure 2: Structurally Inadequate Low Volume Road

Pavement evaluation involves a review of each road section and an assessment of the type and extent of the distress(es) observed. Treatment recommendations are predicated by whether the cause of the major distress(es) is structural or non-structural, while also considering other factors such as truck count, drainage, pavement width, etc...

Flexible pavements will have age-related distresses and wearing such as thermal cracking and oxidation. These distresses are non-structural; however, once a crack develops and water enters the pavement structure, deterioration will accelerate. Poor construction practices, quality control, or materials may produce other non-structural surface defects, such as segregation and raveling, which will also result in a reduced life expectancy of the surface asphalt.

Figure 3: Wheelpath Fatigue Cracking

Fatigue cracking indicates structural failure and can manifest itself in many forms, such as wheel path, alligator, and edge cracking. It can be localized or throughout a road section. When roads that have exhibited fatigue cracking are rehabilitated, there should be particular attention paid to the rehabilitation treatment, to ensure that the upgraded facility has sufficient structure.

Flexible Pavement Road Structure Design

There are a number of flexible pavement structural design methodologies and associated software. The simplest way to describe structural design may be the Granular Base Equivalency (GBE) Methodology. This GBE methodology is still used in Ontario by a number of agencies, and is frequently used as a cross-check where more sophisticated analysis has been undertaken.

The measurement is unit-less and relates to the structural value of one millimetre of Granular 'A' material. The relationship of the typical road building materials is expressed in either of the two following ways:

- **1 mm of HMA = 2 mm of Granular A = 3 mm of Granular B**

Or

- **HMA = 2, Granular A = 1, Granular B = 0.67**

To gain some perspective on what this means in terms of typical construction activities, the following table indicates a typical subdivision road construction as expressed in GBE.

Table 2 Granular Base Equivalency

Material	Example 1 Depth	Granular Base Equivalency	Example 2 Depth	Granular Base Equivalency
Hot Mix Asphalt (HMA)	100	200	150	300
Granular A	150	150	300	300
Granular B	300	200	0	0
TOTAL GBE	**550**	**550**	**600**	**600**

When reconstruction and rehabilitation projects are undertaken, and use of alternate materials and/or road structure is contemplated, the GBE concept is important to bear in mind, as different treatments such as Expanded Asphalt and Cold in Place recycling, also have a structural value. For design purposes, it may be prudent to use a conservative equivalency of 1.5 for these products (although, some sources indicate GBE's of up to 1.8).

As an example, if a 200 mm pavement is replaced with 150 mm of Expanded Asphalt or Cold in Place Recycling, with a 50 mm overlay of Hot Mix asphalt, a pavement structure with a GBE of 400 is replaced by a pavement structure with a GBE of 325; a significant difference. (Using a GBE of 1.5 for the Expanded or Cold in Place.) Premature failure will be the result of an under-designed pavement structure, wasting quality resources and available funding.

The purpose of this example is to illustrate the different structural values that products have. Expanded Asphalt and Cold in Place recycling are both excellent products to rehabilitate pavement structures when used appropriately.

The MTO's *Pavement Design and Rehabilitation Manual Second Edition 2013* is an excellent resource for use in pavement structure design and rehabilitation, and is available from the online MTO Catalog.

Thin Lift Pavements

Hot mix asphalt mixes are designed in Ontario either by the Marshall Method or the Superpave Method. Through time, this has resulted in a number of commonly used mixes that are typically sorted by size. One of the parameters used to describe that sizing is the Nominal Maximum Aggregate Size (NMAS).

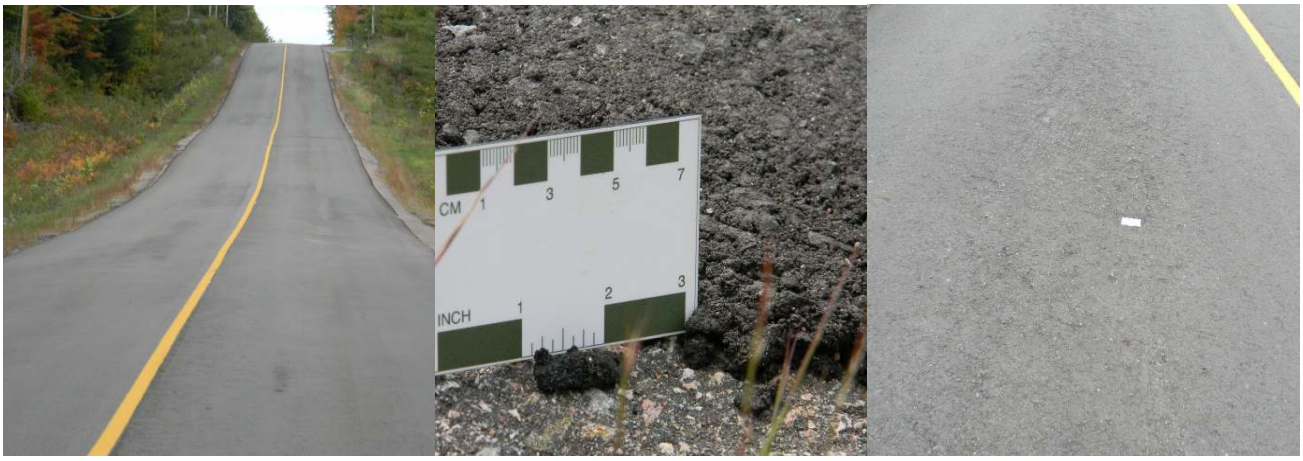
In the Marshall Mix Method, typical mix designations are HL1, HL2, HL3, HL4, and HL8. In the Superpave mix design methodology, mixes are designated by the NMAS. The NMAS is one sieve size larger than the first sieve to retain 10% or more.

The following table identifies the NMAS for the more commonly used mixes, and indicates recommended minimum lift thicknesses for them.

Table 3: Recommended Minimum Lift Thicknesses

Mix Type	NMAS (mm)	Lift Thickness Range (mm)
SP 9.5	9.5	30 to 40
SP 12.5	12.5	40 to 50
SP 19	19.0	60 to 80
HL3	13.2	40 to 55
HL4	16.0	50 to 65
HL8	19.0	60 to 80

Figure 4: Thin Lift Pavement



Thin lift with inappropriate aggregate size

Rigid Pavement Structure

Rigid Pavements are constructed of concrete, or concrete with an asphalt wearing surface. The fundamental difference between a flexible pavement and a rigid pavement is the method in which the load is transferred. Whereas the flexible pavement distributes load through the pavement structure in a conical fashion, with a higher point load directly beneath the loading point, the rigid pavement structure distributes that load in a beam-like fashion, more evenly across the pavement structure. Rigid pavements may have an exposed concrete wearing surface, or they may be covered with an asphaltic concrete wearing surface.

The resulting rigid pavement structure is usually thinner overall, when compared to a flexible pavement, designed to accommodate the same traffic loading. This does not necessarily translate into a reduced cost of construction. Any comparison of costs between flexible and rigid pavements should be on a life cycle basis, for the most accurate assessment.

Older concrete pavements were prone to failure at joints, as load transfer caused a slight movement in the concrete slab, and with the intrusion of water, a structural failure. Newer concrete pavements are designed with improved load transfer technology.

Figure 5 Flexible vs. Rigid Pavement Structure(s)

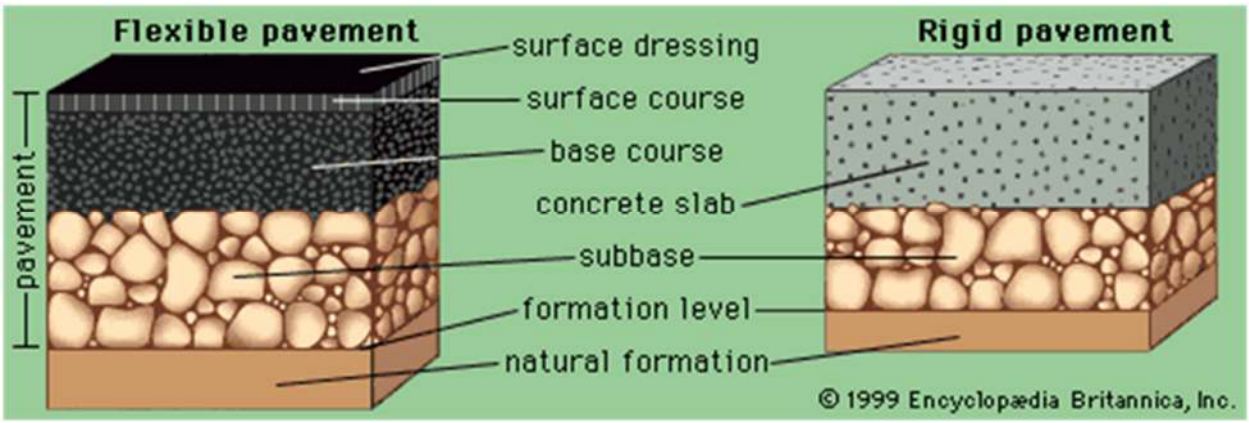
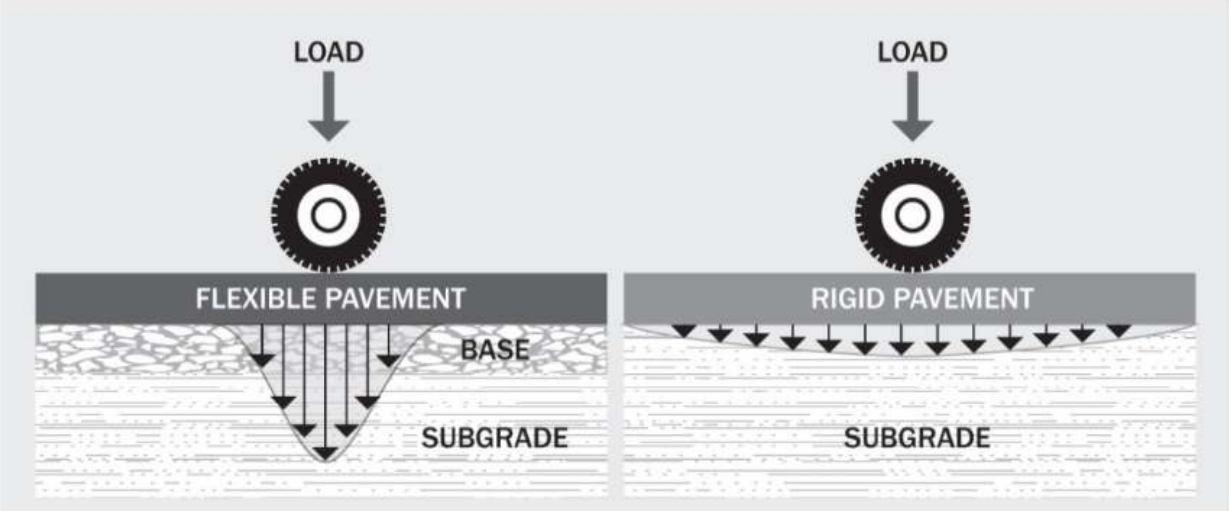


Figure 6: Flexible vs Rigid Pavement Load Distribution (CTAA Hot Mix Asphalt)



Flexible Pavement Distresses and Treatment Selection

Treatment recommendation is dependent upon the condition of the road section at the time of the review.

Treatment Selection – Critical Area Analysis

When using the Inventory Manual methodology all of the 'holistic' needs are considered in the recommendation. For example, a road may appear to require only a resurfacing, however, when the other critical areas are reviewed, there

may be a capacity problem which would then result in a recommendation to resurface and widen (RW) that would address both the pavement condition and the need for additional lanes.

Another example would be where the pavement is exhibiting some type of distress but there is also poor drainage. The recommendation would then be to reconstruct (REC if rural, RSS if urban).

Treatment Selection for Non-Structural Rehabilitation

Resurfacing recommendations are predicated upon the type and extent of distress noted. For example, all pavements will develop thermal/transverse cracking as they age. As the age of the pavement increases, the frequency of the cracking increases. If the spacing of the cracks is still greater than 10m, then the R1 – resurface with one lift of asphalt – treatment will typically be sufficient to restore the road as the treatment provides for overlay and base asphalt repair. However, if the frequency of transverse cracking , which may have become transverse alligator cracking if left unattended too long, then the recommendation will be more extensive, such as a PR2- Pulverize and resurface with 2 lifts of asphalt. The following illustrates transverse cracking.

Figure 7: Transverse /Thermal Cracking (Non Structural)

Reflective Cracking

Paving over an active crack(s) will result in a crack(s) in the same location within 2 to 3 years. As a rule of thumb, the crack will migrate through at approximately 25mm per year. Therefore it would be anticipated that if a 50mm overlay is placed, then the cracking would reappear in approximately 2 years. This is not an efficient usage of available funding.

Figure 8: Reflective Transverse Cracking on Newer Pavement

Treatment Selection for Structural Rehabilitation

Road sections exhibiting structural failure such as fatigue cracking require a more extensive rehabilitation to restore the performance of the road section. In simple terms, placing a single lift of asphalt over structurally failed asphalt will guarantee the same failure in a very short time period. Unless the single lift overlay is placed knowingly as a holding strategy, it should be avoided on structurally deficient pavements. For pavements that have failed structurally or have too frequent transverse cracking, the recommendation is typically PR2 as a minimum provided the drainage is adequate or requires only minor improvement.

Figure 9: Overlay on Failed Pavement and Resultant Reflective Cracking

The above figures illustrate a pavement that has failed both structurally and has very frequent severe transverse cracks. Placement of a 50mm overlay over this type of pavement condition will result in rapid failure and is not recommended, other than if a holding treatment is absolutely necessary. The figure above and to the right illustrates a newer pavement that already has very frequent transverse cracks appearing, likely the result of paving over a failed pavement. Under normal circumstances, the first transverse / thermal cracks generally appear in approximately 4 to 6 years and the cracks are 40m to 50m or more apart. Reflective cracking is dependent on overlay thickness. As a rule of thumb, the cracks will reappear on the surface at approximately 25mm/year. A 50mm overly over a cracked surface will should the underlying defects in approximately 2 years.

Appendix C: Deterioration Curve Detail

Asset Classes and Deterioration Curves for Roads

Asset Classes

In order to utilize the Best Practice and Performance Modeling modules of the WorkTech Asset Manager Foundation software (WT), assets must be defined by an asset class.

Conventional wisdom has been to define road assets by their functional classes such as Arterial, Collector or Local, and then further differentiate by usage, such as residential or commercial. From a performance modeling perspective, using the functional classification will only work to a point, as the traffic on a functional class can and does vary significantly between agencies. There may also be differences in surface materials, which will have different performance and life cycle events.

Functional classifications also vary dependent on the methodology being utilized. Commonly used classification systems have been developed a number of agencies including the Transportation Association of Canada (TAC) and the Ontario Ministry of Transportation (MTO). Both utilize combinations of roadside environment, functional classifications, and in some cases, speed limit. In both these examples, surface materials are not a consideration in the classification.

In Ontario, Regulation 239/02, Minimum Maintenance Standards for Municipal Highways, and Regulation 588/17, Asset Management Planning for Municipal Infrastructure also provide for road asset classification.

The various classifications all serve a purpose. However, within any given functional classification such as may be found in O.Reg 239/02, O.Reg 588/17 or the Inventory Manual, roadside environment, surface material, traffic count and commercial traffic counts can vary significantly. Those parameters result in varying performance, replacement and treatment costs.

To develop more accurate pavement performance prediction models, parameters that are common to a group of assets have to be accommodated in the road asset classification (and are not accommodated in the aforementioned classification methodologies.) The performance/deterioration of a road section is more predictable based on surface type and traffic volume rather than by functional class.

Based on that philosophy, 4 Roads developed road asset classifications based on by Surface Type, Traffic Volume and Roadside Environment. Roadside Environment has been added to accommodate the differences in replacement and improvement costs between rural, semi urban and urban cross-sections.

Typically, the traffic range for road assets with a gravel (G/S) or surface treated surface (LCB) is quite limited. However, road assets with a hot mix asphalt surface (HCB) may have a significant variance in traffic volume, and a resultant difference in anticipated performance. As such, road assets with more limited traffic ranges have been differentiated by surface type and roadside environment. For HCB road assets the profiles are subdivided by road side environment, and further subdivided into four traffic ranges.

Table 1: Road Asset Surface Materials

Acronym	Description	Acronym	Description
ETH	Earth	C/M	Cold Mix
G/S	Gravel Stone or Other Loose Top	HCB	High Class Bituminous
HFL	High Float, similar to LCB	CON	Concrete
LCB	Low Class Bituminous (Surface Treatment)	A/C	Asphalt over Concrete
ICB	Intermediate Class Bituminous	OTH	Other

Table 2 identifies the road asset classes that have been developed for use in WT by 4 Roads Management Services Inc.

Asset Classes and Deterioration Curves for Roads

Table 2: Road Asset Classes

Asset Class	Subtype	Material	RDSE Envt	AADT Low	AADT High
A/C-R	All	A/C	R	1	100,000
A/C-S	All	A/C	S	1	100,000
A/C-U	All	A/C	U	1	100,000
CM1-R	All	C/M	R	1	3,000
CM1-S	All	C/M	S	1	3,000
CM1-U	All	C/M	U	1	3,000
CON-R	All	CON	R	1	100,000
CON-S	All	CON	S	1	100,000
CON-U	All	CON	U	1	100,000
GST1-R	All	G/S	R	1	10,000
GST1-S	All	G/S	S	1	10,000
HCB1-R	All	HCB	R	20,000	100,000
HCB1-S	All	HCB	S	20,000	100,000
HCB1-U	All	HCB	U	20,000	100,000
HCB2-R	All	HCB	R	10,000	19,999
HCB2-S	All	HCB	S	10,000	19,999
HCB2-U	All	HCB	U	10,000	19,999
HCB3-R	All	HCB	R	1,000	9,999
HCB3-S	All	HCB	S	1,000	9,999
HCB3-U	All	HCB	U	1,000	9,999
HCB4-R	All	HCB	R	1	999
HCB4-S	All	HCB	S	1	999
HCB4-U	All	HCB	U	1	999
ICB-S	All	ICB	S	1	3,000
ICB-U	All	ICB	U	1	3,000
ICB1-R	All	ICB	R	1	3,000
LCB1-R	All	LCB	R	1	2,000
LCB1-S	All	LCB	S	1	2,000
LCB1-U	All	LCB	U	1	2,000

Asset classes are differentiated by surface material, roadside environment and traffic range.

Deterioration Curves

From **ASTM 6433**, Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys, Pavement Condition Index (PCI) is defined as follows;

> *'2.1.4 pavement condition index (PCI)—a numerical rating of the pavement condition that ranges from 0 to 100 with 0 being the worst possible condition and 100 being the best possible condition.*
>
> *4.1 The PCI is a numerical indicator that rates the surface condition of the pavement. The PCI provides a measure of the present condition of the pavement based on the distress observed on the surface of the pavement, which also indicates the structural integrity and surface operational condition (localized roughness and safety). The PCI cannot measure structural capacity nor does it provide direct measurement of skid resistance or roughness. It provides an objective and rational basis for determining maintenance and repair needs and priorities. Continuous monitoring of the PCI is used to establish the rate of pavement deterioration, which permits early identification of major rehabilitation needs. The PCI provides feedback on pavement performance for validation or improvement of current pavement design and maintenance procedures.'*

There are many different 'PCI' indices across Ontario and North America. Typically, the PCI methodology varies by surface material, as there are different failure mechanisms for the different surface materials. PCI methodologies rate all distresses- structural or otherwise- with the rater assigning a severity and density for each defect. PCI indices also usually include a ride component which is factored in with the distresses to a varying degree based on methodology used.

The Inventory Manual distress rating is Structural Adequacy (SA). It is a measure of the percentage of the road section that is exhibiting structural distress i.e., fatigue, alligator, wheel path cracking. Other defects including non structural pavement defects, surface widths, drainage etc are factored into the improvement recommendation by the rater. Ride (Surface Condition in the IM) is not factored into this rating.

Due to the aforementioned differences between the rating methodologies, a direct mathematical conversion would be difficult. Table 2.1 provides an approximation between the PCI methodology for hot mix asphalt pavements as shown in MTO's Pavement Rehabilitation and Design Manual, Second Edition 2013, and the Inventory Manual for Municipal Roads, 1991. As a further example, PCI ratings from ASTM 6433 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys tend to align more closely with the Physical Condition ratings (Structural Adequacy time 5)

In WorkTech, Physical Condition is the Structural Adequacy multiplied by 5 to produce a score from 5 to 100; very much a parallel to the PCI and its' inherent usage as identified above.

When using the Inventory Manual (IM) methodology, Structural Adequacy is a measurement of the percentage of the surface of the road that is exhibiting structural distress. The rater will consider the type of distress as well as the other critical areas (surface width, capacity, geometry, drainage, and surface type) in order to provide a recommendation for an improvement. In the IM, any, or multiple of the critical areas, may produce a Time of Need (TON). The overall TON of the road section is the worst of all of the TON's. For example, if five of the TON's are ADEQ, and one is NOW, the section is a NOW need.

All deterioration curves relate to the 'Physical Condition' data field in WorkTech. The Physical Condition deterioration curve is specific to the Inventory Manual and therefore the trigger points and definition of the curve will be different than other methodologies. It should be noted that different evaluation methodologies will produce varying deterioration curves and trigger points. Familiarity with the rating system being utilized is essential.

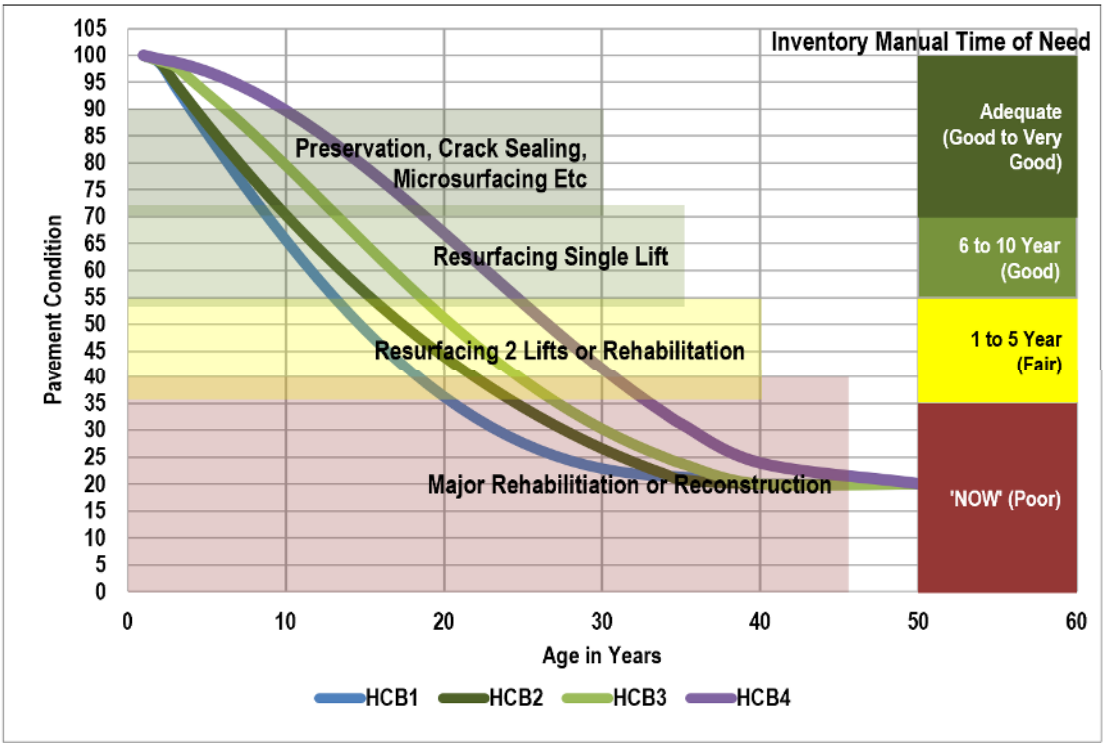
It would be possible, but very difficult, to develop performance models around all of the critical areas. So, for the purposes of the performance modeling, Structural Adequacy (distress) has been selected to be the driver in the decisions with respect to the model. This is typical with most performance modeling software.

Models can be configured to weight factors, such as condition, and traffic in project selection to develop a program. From a pure asset management perspective, weighting project selection for best return on investment (ROI) will produce a work plan that most effectively utilizes available funding.

Models may also be configured to select the improvement recommended from the field review or use the deterioration curve based on just the structural rating. Typically, 4 Roads uses the recommended treatment as that should address all of the defects, not just the pavement defects. In the early years of the model, if a project is selected that has a recommended improvement type resultant from the field review, that improvement will be used for the project in the year that it is selected based on the model configuration and available funding. In the later years, presumably after all current deficiencies have been corrected, the model will revert to the assigned asset class for deterioration and project selection based on estimated condition.

The deterioration curves are the same for each asset class regardless of roadside environment. The difference is the improvement and replacement costs; urban treatments are more expensive. For example, for urban sections, the replacement improvement is RSS- Reconstruction with Storm Sewers, rather than REC- Reconstruction Rural, used for rural and semi urban cross sections.

Figure 1: Physical Condition versus Improvement Selection by Hot Mix Asphalt Asset Class



In 4 Roads WorkTech setup where the MTO PCI / Inventory Manual Hybrid Condition Rating format is being used, the PCI data is entered to produce a PCI score from different formulas that represent the defects and weightings by surface type. The PCI formulae are from the Ministry of Transportation of Ontario Pavement Rehabilitation and Design Manual, Second Edition, 2013.

The PCI score is then used to approximate a Structural Adequacy score (and a Physical Condition). Table 3 identifies the approximations to convert PCI to Structural Adequacy and a Time of Need.

Once a Structural Adequacy Score has been determined, the TON is also calculated. What this achieves is the detail of PCI data collection and the strength of the holistic evaluation of the Inventory Manual.

The PCI comparator in Table 3 is for HCB roads using the rating methodology in the Ministry of Transportation of Ontario Pavement Rehabilitation and Design Manual, Second Edition, 2013. Different PCI methodologies will produce a different PCI score as the number and weighting of defects may change. There is also a significant difference in how ride is integrated into the overall formula. Structural Adequacy ratings do not include a ride component and only include structural defects. PCI ratings typically include rating for all types of defects, structural or not.

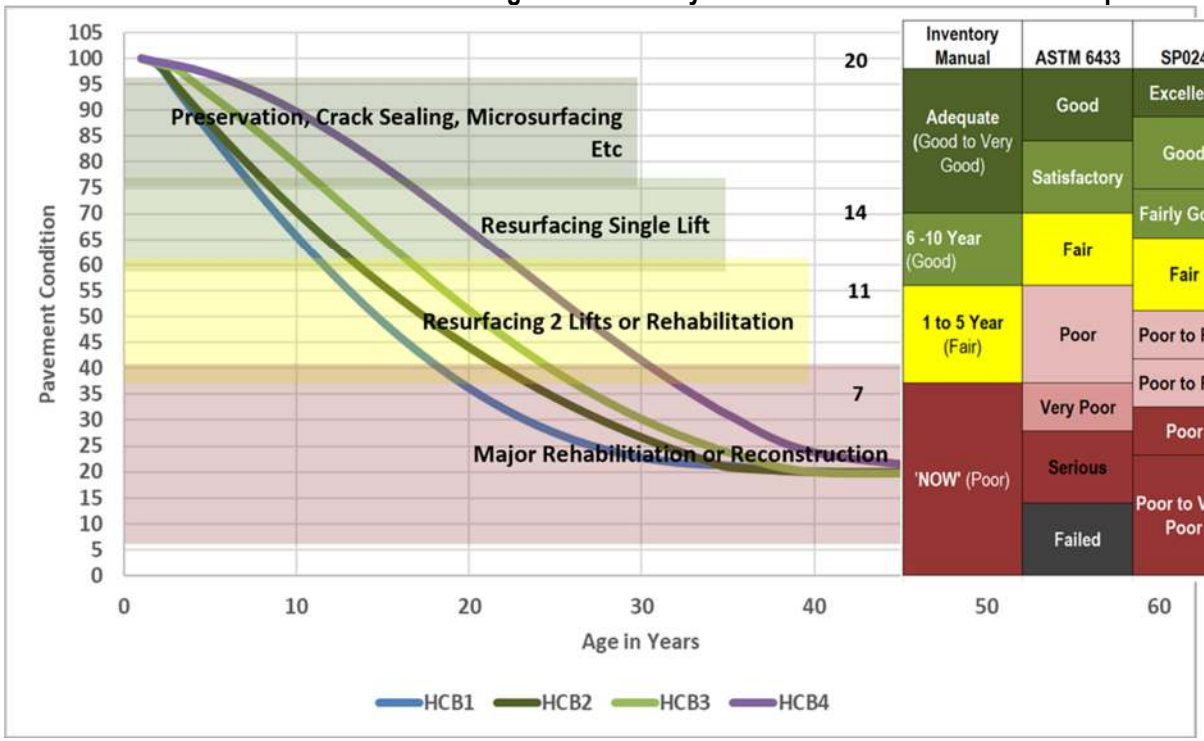
PCI rating methodologies typically include a severity and extent of a defect. The Inventory Manual is more of a presence/absence measure.

Given the foregoing discussion, Table 3 indicates approximations rather than an equation to directly convert the ratings.

Table 3: PCI to Structural Adequacy Approximations

PCI Range	SA	Physical Condition (SA * 5)	% Structural Distress - Inventory Manual	Time of Need - Inventory Manual	Descriptor
100	20	100	<5	ADEQ	Good
100	19	95	5-10	ADEQ	Good
95-99	18	90	5-10	ADEQ	Good
89-95	17	85	5-10	ADEQ	Good
85-89	16	80	5-10	ADEQ	Good
86-86	15	75	5-10	ADEQ	Good
81-85	14	70	11	6 to 10	Good
75-81	13	65	11-15	6 to 10	Good
74-76	12	60	11-15	6 to 10	Good
73-75	11	55	15	1 to 5	Fair
67-73	10	50	16-20	1 to 5	Fair
59-67	9	45	16-20	1 to 5	Fair
55-59	8	40	16-20	1 to 5	Fair
52-55	7	35	20	NOW	Poor
44-53	6	30	33	NOW	Poor
36-44	5	25	46	NOW	Poor
28-36	4	20	59	NOW	Poor
21-28	3	15	72	NOW	Poor
18-21	2	10	85	NOW	Poor
10-18	1	5	100	NOW	Poor

Figure 2: Inventory Manual / Pavement Condition Comparisons



Inventory Manual	ASTM 6433	SP024	PAV81	
Adequate (Good to Very Good)	Good	Excellent	Excellent	No Maintenance Required
	Satisfactory	Good	Good	Normal Maintenance Only
6 -10 Year (Good)	Fair	Fairly Good	Fairly Good	Resurface in 3-5 years
		Fair	Fair	Resurface within 3 Years
1 to 5 Year (Fair)	Poor	Poor to Fair	Poor to Fair	Reconstruct in 4-5 years or resurface within 2 years with extensive padding
		Poor to Fair	Poor to Fair	Reconstruct in 3-4 years
'NOW' (Poor)	Very Poor	Poor	Poor	Reconstruct in 2-3 years
	Serious	Poor to Very Poor	Poor to Very Poor	Reconstruct within 2 Years
	Failed			

Notes: Deterioration curves were developed by 4 Roads for HCB Roads

The ‘Good’, ‘Fair’, ‘Poor’ descriptors were taken from the respective rating methodology documents

Figure 3:Inventory Manual / Physical Condition Comparison to SP021 (for LCB Roads)

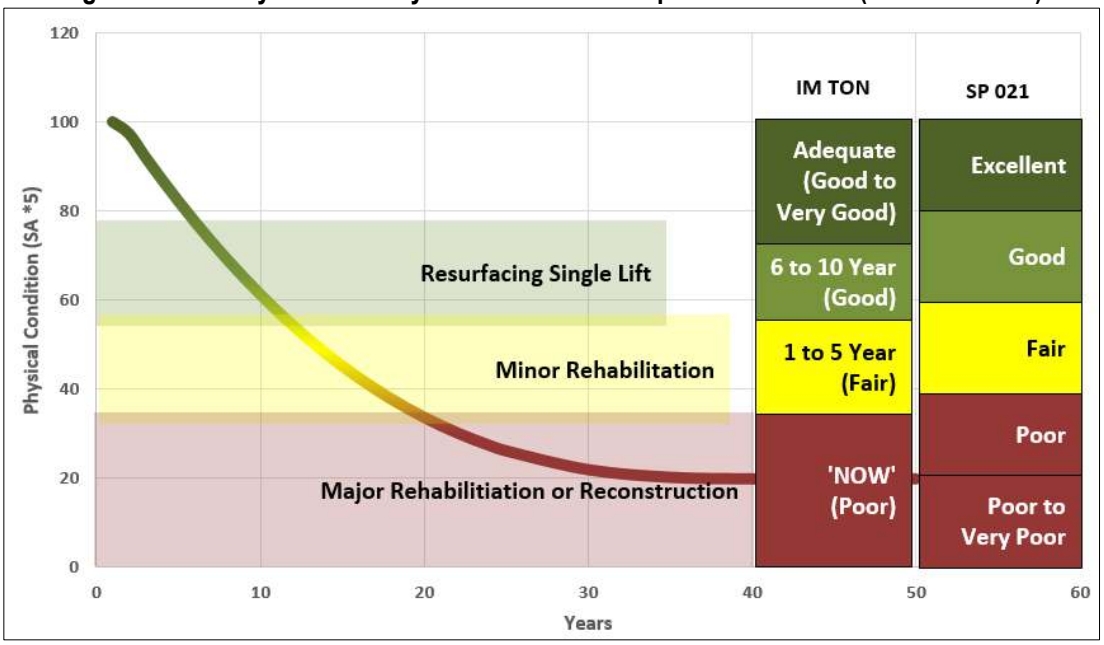
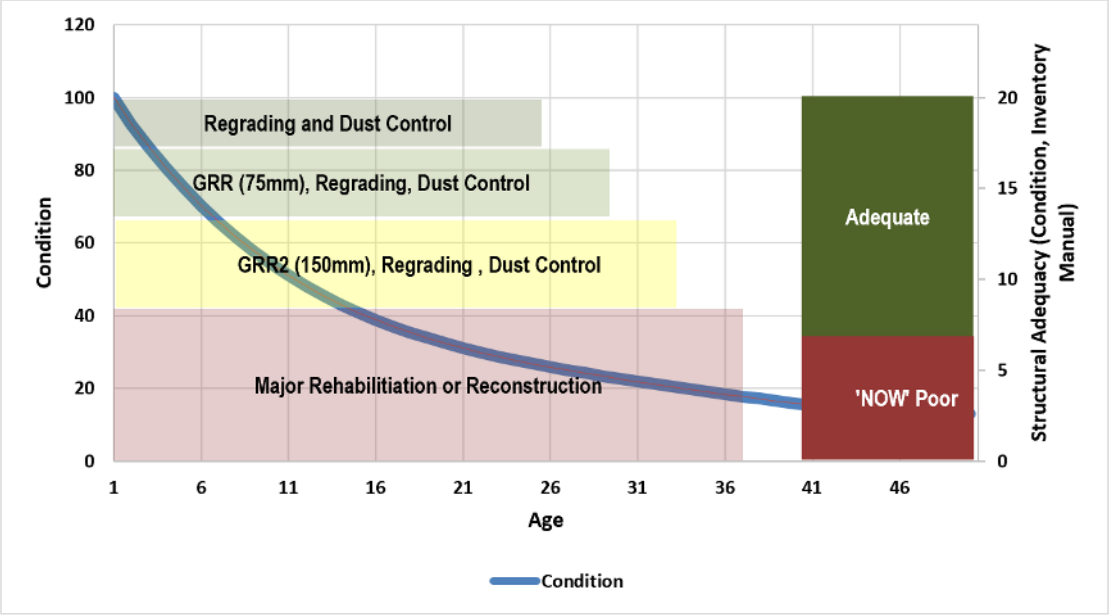


Figure 4: Inventory Manual TON vs Improvement Recommendation for Gravel Roads



Improvement Types- Effect on the Asset

Appendix A of this report includes a summary of the improvement types that are included in the inventory Manual. In WorkTech there is no restriction on what may be developed as an improvement type for a road agency. However, regardless of the improvement types that are used, the effect that the improvement has on the asset has to be understood in order to use performance modeling.

Asset Classes and Deterioration Curves for Roads

Table 4 identifies a number of improvement types and further identifies the effect that they have on a road asset. A similar approach may be taken with other assets.

The effect that a treatment has on an asset is critical to the analysis. Inaccurate determination of the effect of a treatment on an asset will produce an inaccurate – and indefensible- result. The following chart is a comparison of the deterioration of a road section without any treatment applied versus a road section that has appropriate treatment at the optimal condition, producing a more cost effective life cycle.

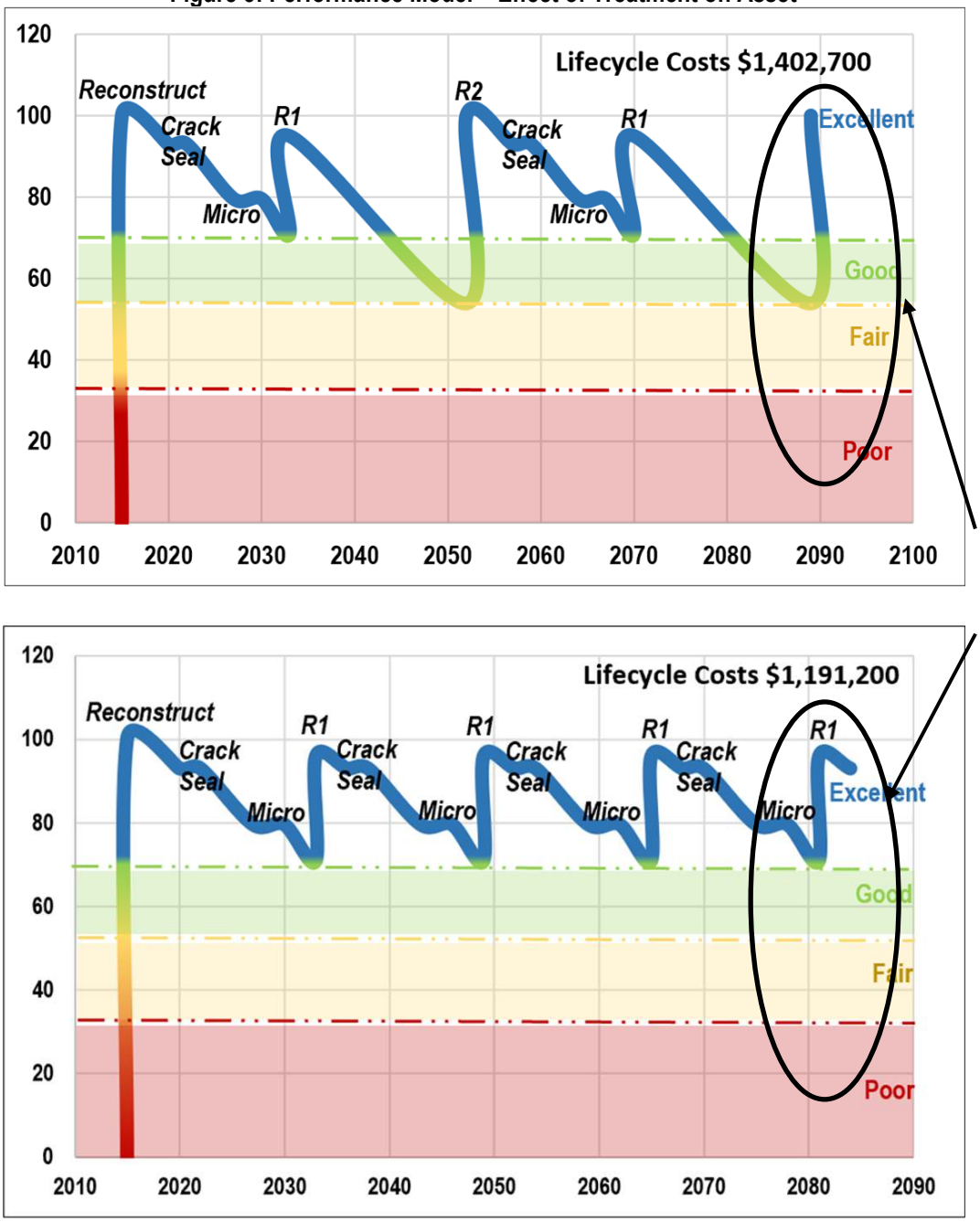
Table 4: Treatment Effect on the Asset

Code	Description	Effect on the Asset
R1	Basic Resurfacing – Single Lift	Increase Physical Condition by 27
R2	Basic Resurfacing – Double Lift	Increase Physical Condition to 100
RM	Major Resurfacing	Increase Physical Condition to 100
PR1	Pulverizing and Resurfacing – Single Lift - Generally not recommended by 4 Roads	Increase Physical Condition to 90
PR2	Pulverizing and Resurfacing – Double Lift –May be substituted with CIR, CIREAM, with appropriate structural investigation	Increase Physical Condition to 100
BS	Base and Surface Tolerable – Tolerable standard for lower volume roads – Rural and Semi-Urban Cross sections only	Increase Physical Condition to 95
RW	Resurface and Widen	Increase Physical Condition to 97
REC	Reconstruction	Increase Physical Condition to 100
RNS	Reconstruction Nominal Storm Sewers (Urban: no new sewer, adjust manholes, catch basins, add sub-drain, remove and replace curb and gutter, granular, and hot mix)	Increase Physical Condition to 100
RSS	Reconstruction including Installation of Storm Sewers (New storm sewers and manholes in addition to the above)	Increase Physical Condition to 100
NC	Proposed Road Construction	Increase Physical Condition to 100
NONE	No Improvement Recommended	No Effect
SRR	Storm Sewer Installation and Road Reinstatement	No Effect
CRK	Crack Sealing	Hold Physical Condition for 2 Years
MICRO	Microsurfacing	Hold Physical Condition for 3 years
GRR	Gravel Road Resurfacing – add 75mm	Hold Physical Condition for 3 years
GRR2	Gravel Road Resurfacing - Add 150mm	Increase Physical Condition by 20
SST	Single Surface Treatment	Increase Physical Condition to 90
DST	Double Surface Treatment	Increase Physical Condition to 95
DSTrehab	Double Surface Treatment Rehabilitation- Pulverize, Add 75mm Aggregate, Double Surface Treat to edge of rounding, Ditching	Increase Physical Condition to 95

Performance Model Project Selection

From a pure asset/pavement management perspective, 4 Roads believes that project selection based on return on investment of the improvement type will produce a work plan that optimizes available funding. Typically, if the return on investment (ROI) scenario is selected, the preservation and resurfacing activities offer the highest ROI and are prioritized within the work plan model.

Figure 5: Performance Model – Effect of Treatment on Asset



Notes: *Lifecycle activities will depend on initial design and asphalt thickness*

Top graph may more closely resemble a perpetual pavement life cycle; bottom graph may more closely resemble a lower volume road such as in a subdivision

Figure 5 illustrates several different aspects of performance model output including the effect of a treatment on an asset and the effect of multiple treatments undertaken at the optimal asset condition to produce a cost effective management strategy.

Similar calculations are utilized to determine the scenario ROI and the improvement type ROI. The following is excerpted from the WorkTech Manual.

Scenario Return on Investment

$$ROI = \frac{(End\ of\ Scenario\ Asset\ Value - Do\ Nothing\ Asset\ Value)}{Total\ Budget\ (all\ years)}$$

Improvement Type Return on Investment

$$ROI = \frac{(Value\ if\ Funded - Do\ Nothing\ Value)}{Improvement\ Cost.}$$

Within any given scenario, weightings may be applied that will affect project selection. Weighting factors may be applied for best condition, worst condition

Calculation Methods (from the WorkTech Manual)

The calculation method choice tells the program whether to determine budget needs or, optimize a given budget. Choices are as follows

- ***Calculate Budget to Maintain Current Average Condition**. The program will determine the budget and work plan to keep the average condition for each service class at the current level. For example, if Arterial Roads are at an average condition of 72, the program will determine what is needed to maintain the average condition of 72.*
- ***Calculate Budget to Produce Desired Average Condition**. The program will determine the budget and work plan required to produce the entered average condition value at the end of the scenario.*
- ***Calculate Results for Entered Budgets**. You will enter the available budget by year and the program will optimize this based on your spending objective.*

Spending Objective (from the WorkTech Manual)

With any of the above Calculation Methods the program needs to make choices on which improvements to fund. The program will do this based on your spending objective. You have the option of selecting one of several pre-defined objectives or, creating a custom spending priority objective. Options for your spending objective are as follows

Return on Investment *The program will prioritize work that results in the highest return on investment.*

$$ROI = \frac{(Asset\ Value\ if\ Work\ is\ Funded - Do\ Nothing\ Asset\ Value)}{Cost\ of\ Required\ Work}$$

Needs Savings *The program will prioritize work which results in the highest reduction in Needs.*

$$Needs\ Savings\ Percent = \frac{(Current\ Needs - Next\ Year\ Needs\ if\ work\ is\ Funded)}{Cost\ of\ Required\ Work}$$

Best Condition	*The program will prioritize assets based on condition value.*
Lowest Condition	*The program will prioritize assets based on inverse condition (1 / condition)*
Custom	*Displays the Custom Priority Setup Group Box. May be defined by one or more weighting formulas.*
	Weighting types may include ROI, Needs Savings, Inverse Condition, Service Class and AADT or combinations thereof.

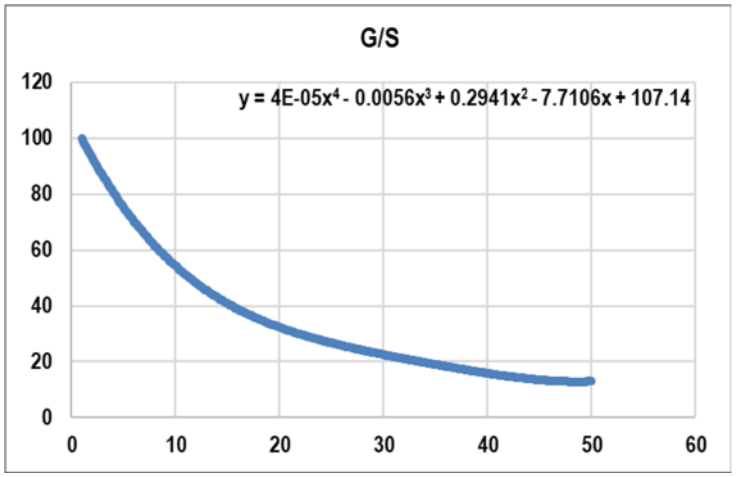
Deterioration Curves by Surface Type and Traffic Volume

The following pages includes tables and graphs indicating the anticipated performance of an appropriately constructed road asset and the condition triggers for treatments. The deterioration curves by asset class used in concert with the table indicating the treatment effect on the asset, and the agency's unit costs, will produce a performance model that demonstrates the effect on the system at various budget levels and produce a program based on input parameters.

Asset Classes and Deterioration Curves for Roads

Gravel Roads- All Roadsides, all AADT

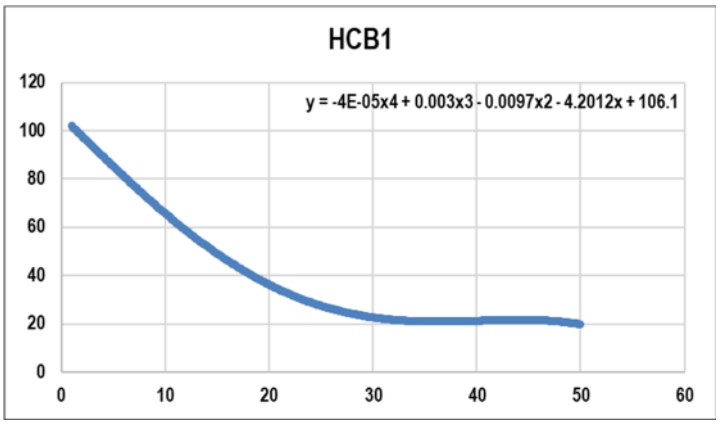
Year	Condition	Imp Type	Description
1	100	NONE	No Improvement Required
2	92.45	NONE	No Improvement Required
3	86.21	GRR	75mm of Granular A
4	80.43	GRR	75mm of Granular A
5	75.11	GRR	75mm of Granular A
6	70.21	GRR	75mm of Granular A
7	65.7	GRR2	150mm of additional Gravel
8	61.55	GRR2	150mm of additional Gravel
9	57.75	GRR2	150mm of additional Gravel
10	54.27	GRR2	150mm of additional Gravel
11	51.07	GRR2	150mm of additional Gravel
12	48.15	GRR2	150mm of additional Gravel
13	45.48	GRR2	150mm of additional Gravel
14	43.04	GRR2	150mm of additional Gravel
15	40.81	BS	Base and Surface
16	38.77	BS	Base and Surface
17	36.9	BS	Base and Surface
18	35.2	REC	Reconstruction - Rural
19	33.63	REC	Reconstruction - Rural
20	32.19	REC	Reconstruction - Rural
21	30.86	REC	Reconstruction - Rural
22	29.64	REC	Reconstruction - Rural
23	28.51	REC	Reconstruction - Rural
24	27.45	REC	Reconstruction - Rural
25	26.47	REC	Reconstruction - Rural
30	22.28	REC	Reconstruction - Rural
35	18.88	REC	Reconstruction - Rural
40	20	REC	Reconstruction - Rural
45	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural



Asset Classes and Deterioration Curves for Roads

HCB1 All Roadsides- AADT > 20,000, assumes 10% Commercial

Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	98.61	NONE	No Improvement Required
3	94.19	NONE	No Improvement Required
4	89.83	CRK	Crack Sealing
5	85.55	CRK	Crack Sealing
6	81.36	CRK	Crack Sealing
7	77.26	MICRO	Microsurfacing– Pavement Preservation
8	73.28	MICRO	Microsurfacing Pavement Preservation
9	69.4	R1	Basic Resurfacing 1 - 50mm
10	65.65	R1	Basic Resurfacing 1 - 50mm
11	62.02	R1	Basic Resurfacing 1 - 50mm
12	58.54	R1	Basic Resurfacing 1 - 50mm
13	55.19	R2	Basic Resurfacing 2 - 100mm
14	52	R2	Basic Resurfacing 2 - 100mm
15	48.96	R2	Basic Resurfacing 2 - 100mm
16	46.08	R2	Basic Resurfacing 2 - 100mm
17	43.36	R2	Basic Resurfacing 2 - 100mm
18	40.81	R2	Basic Resurfacing 2 - 100mm
19	38.41	R2	Basic Resurfacing 2 - 100mm
20	36.19	REC	Reconstruction - Rural
22	32.24	REC	Reconstruction - Rural
23	30.51	REC	Reconstruction - Rural
24	28.95	REC	Reconstruction - Rural
25	27.55	REC	Reconstruction - Rural
26	26.3	REC	Reconstruction - Rural
27	25.21	REC	Reconstruction - Rural
28	24.27	REC	Reconstruction - Rural
29	23.47	REC	Reconstruction - Rural
30	22.82	REC	Reconstruction - Rural
35	21.31	REC	Reconstruction - Rural
40	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural

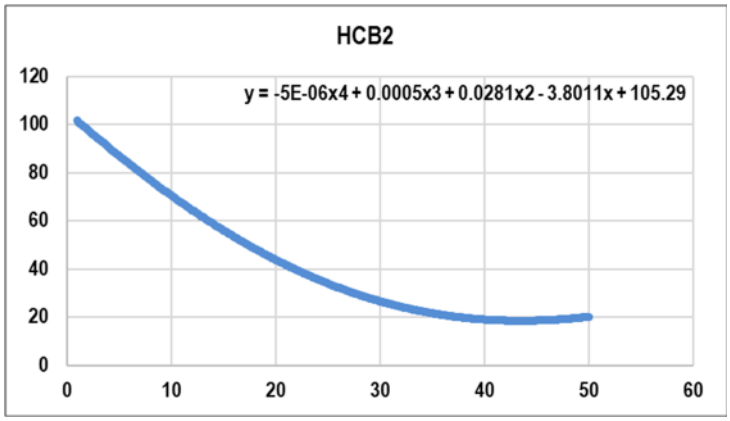


Where 'REC' is specified, 'RSS' is utilized for an Urban Roadside Environment

Asset Classes and Deterioration Curves for Roads

HCB 2 All Roadsides- AADT >10,000 <20,000, Assumes 10% Commercial

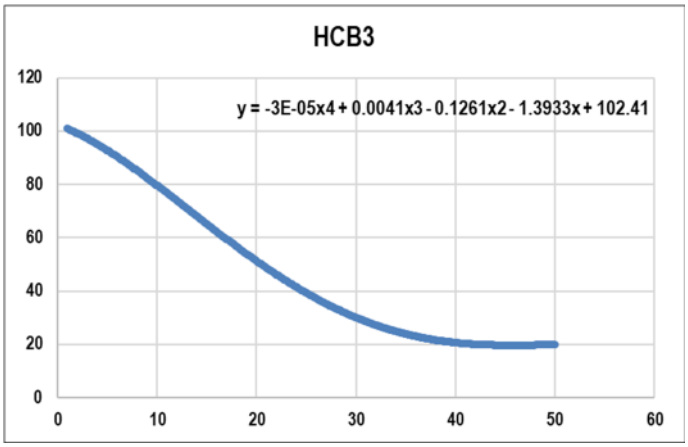
Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	98.79	NONE	No Improvement Required
3	94.85	NONE	No Improvement Required
4	91.01	CRK	Crack Sealing
5	87.29	CRK	Crack Sealing
6	83.68	CRK	Crack Sealing
7	80.18	CRK	Crack Sealing
8	76.79	MICRO	Microsurfacing Pavement Preservation
9	73.51	MICRO	Microsurfacing Pavement Preservation
10	70.33	R1	Basic Resurfacing 1 - 50mm
11	67.26	R1	Basic Resurfacing 1 - 50mm
12	64.28	R1	Basic Resurfacing 1 - 50mm
13	61.41	R1	Basic Resurfacing 1 - 50mm
14	58.63	R1	Basic Resurfacing 1 - 50mm
15	55.95	R2	Basic Resurfacing 2 - 100mm
16	53.38	R2	Basic Resurfacing 2 - 100mm
17	50.89	R2	Basic Resurfacing 2 - 100mm
18	48.5	R2	Basic Resurfacing 2 - 100mm
19	46.2	R2	Basic Resurfacing 2 - 100mm
20	43.99	R2	Basic Resurfacing 2 - 100mm
21	41.87	R2	Basic Resurfacing 2 - 100mm
22	39.84	R2	Basic Resurfacing 2 - 100mm
23	37.89	R2	Basic Resurfacing 2 - 100mm
24	36.03	R2	Basic Resurfacing 2 - 100mm
25	34.26	REC	Reconstruction - Rural
26	32.56	REC	Reconstruction - Rural
27	30.95	REC	Reconstruction - Rural
28	29.42	REC	Reconstruction - Rural
29	27.97	REC	Reconstruction - Rural
30	26.59	REC	Reconstruction - Rural
35	20.86	REC	Reconstruction - Rural
40	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural



Where 'REC' is specified, 'RSS' is utilized for an Urban Roadside Environment

HCB 3 All Roadsides – AADT 1,000 < 10,000, Assumes 10% Commercial

Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	99.44	NONE	No Improvement Required
3	97.46	NONE	No Improvement Required
4	95.29	NONE	No Improvement Required
5	92.95	CRK	Crack Sealing
6	90.48	CRK	Crack Sealing
7	87.88	CRK	Crack Sealing
8	85.18	CRK	Crack Sealing
9	82.4	CRK	Crack Sealing
10	79.56	MICRO	Microsurfacing Pavement Preservation
11	76.67	MICRO	Microsurfacing Pavement Preservation
12	73.76	MICRO	Microsurfacing Pavement Preservation
13	70.83	R1	Basic Resurfacing 1 - 50mm
14	67.91	R1	Basic Resurfacing 1 - 50mm
15	65.01	R1	Basic Resurfacing 1 - 50mm
16	62.14	R1	Basic Resurfacing 1 - 50mm
17	59.31	R1	Basic Resurfacing 1 - 50mm
18	56.54	R1	Basic Resurfacing 1 - 50mm
19	53.83	R2	Basic Resurfacing 2 - 100mm
20	51.19	R2	Basic Resurfacing 2 - 100mm
21	48.63	R2	Basic Resurfacing 2 - 100mm
22	46.17	R2	Basic Resurfacing 2 - 100mm
23	43.8	R2	Basic Resurfacing 2 - 100mm
24	41.53	R2	Basic Resurfacing 2 - 100mm
25	39.37	R2	Basic Resurfacing 2 - 100mm
26	37.31	R2	Basic Resurfacing 2 - 100mm
27	35.37	R2	Basic Resurfacing 2 - 100mm
28	33.54	REC	Reconstruction - Rural
29	31.82	REC	Reconstruction - Rural
30	30.22	REC	Reconstruction - Rural
35	23.83	REC	Reconstruction - Rural
40	20	REC	Reconstruction - Rural
45	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural

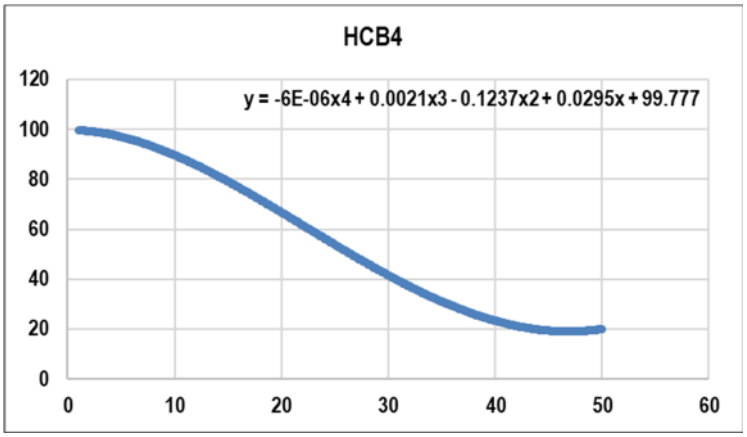


Where 'REC' is specified, 'RSS' is utilized for an Urban Roadside Environment

Asset Classes and Deterioration Curves for Roads

HCB 4 All Roadsides- AADT <1,000, Assumes 5% Commercial

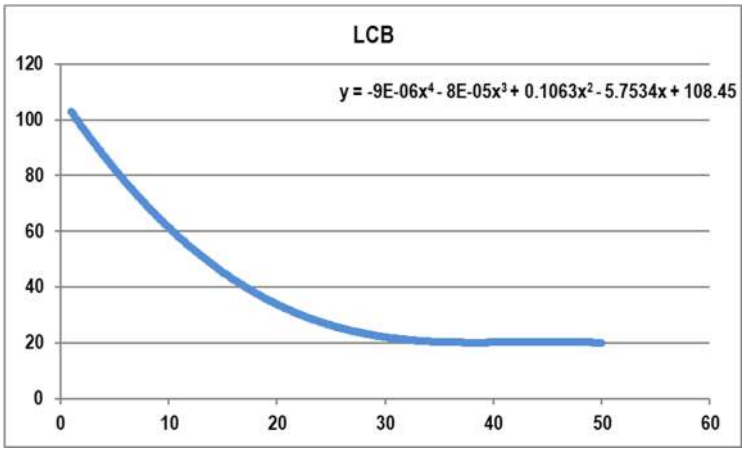
Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	99.3	NONE	No Improvement Required
3	98.73	NONE	No Improvement Required
4	97.96	NONE	No Improvement Required
5	97	CRK	Crack Sealing
6	95.86	CRK	Crack Sealing
7	94.55	CRK	Crack Sealing
8	93.09	CRK	Crack Sealing
9	91.48	CRK	Crack Sealing
10	89.73	CRK	Crack Sealing
11	87.85	CRK	Crack Sealing
12	85.85	CRK	Crack Sealing
13	83.76	CRK	Crack Sealing
14	81.56	CRK	Crack Sealing
15	79.27	MICRO	Microsurfacing Pavement Preservation
16	76.91	MICRO	Microsurfacing Pavement Preservation
17	74.48	MICRO	Microsurfacing Pavement Preservation
18	72	MICRO	Microsurfacing Pavement Preservation
19	69.47	R1	Basic Resurfacing 1 - 50mm
20	66.91	R1	Basic Resurfacing 1 - 50mm
21	64.32	R1	Basic Resurfacing 1 - 50mm
22	61.71	R1	Basic Resurfacing 1 - 50mm
23	59.1	R1	Basic Resurfacing 1 - 50mm
24	56.5	R1	Basic Resurfacing 1 - 50mm
25	53.91	R2	Basic Resurfacing 2 - 100mm
26	51.35	R2	Basic Resurfacing 2 - 100mm
27	48.82	R2	Basic Resurfacing 2 - 100mm
28	46.33	R2	Basic Resurfacing 2 - 100mm
29	43.91	R2	Basic Resurfacing 2 - 100mm
30	41.55	R2	Basic Resurfacing 2 - 100mm
35	31.1	REC	Reconstruction - Rural
40	23.85	REC	Reconstruction - Rural
45	21.06	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural



Where 'REC' is specified, 'RSS' is utilized for an Urban Roadside Environment

LCB All roadsides – All AADT's

Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	98.61	NONE	No Improvement Required
3	94.19	NONE	No Improvement Required
4	89.84	NONE	No Improvement Required
5	85.56	NONE	No Improvement Required
6	81.36	NONE	No Improvement Required
7	77.26	SST	Single Surface Treatment
8	73.28	SST	Single Surface Treatment
9	69.4	SST	Single Surface Treatment
10	65.65	SST	Single Surface Treatment
11	62.02	SST	Single Surface Treatment
12	58.54	SST	Single Surface Treatment
13	55.19	SST	Single Surface Treatment
14	52	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
15	48.96	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
16	46.08	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
17	43.36	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
18	40.81	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
19	38.41	DSTrehab	Double Surface Treat Rehab inc Spot Drainage
20	36.19	REC	Reconstruction - Rural
21	34.13	REC	Reconstruction - Rural
22	32.24	REC	Reconstruction - Rural
23	30.51	REC	Reconstruction - Rural
24	28.95	REC	Reconstruction - Rural
25	27.55	REC	Reconstruction - Rural
30	22.82	REC	Reconstruction - Rural
35	21.31	REC	Reconstruction - Rural
40	21.92	REC	Reconstruction - Rural
45	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural



Where 'REC' is specified, 'RSS' is utilized for an Urban Roadside Environment

Appendix D: Gravel Road Conversions

Gravel Road Conversion Overview

Gravel roads tend to be the 'forgotten' asset. Gravel roads form an integral component of the road asset group for a large number of municipalities and should be managed as any other asset.

Most aspects of municipal service delivery are in fact an asset management decision. The decision whether to surface treat a road, or have the road remain as a gravel surface, is very much an asset management decision.

This report provides a recommended annual cost for gravel road maintenance of 75mm additional gravel to be added every three years, and does not included regular grading or dust control costs. The additional 75mm of gravel was a typical standard that was used in the past by many municipalities. Due to the natural life cycle wear and tear, maintenance, and winter control activities, gravel roads require additional gravel on a regular basis to ensure continuing performance.

One of the difficulties in determining the deterioration of a gravel road is that the wearing surface and the granular layers are one and the same, so the extent of deterioration may not be as obvious until the deterioration is significant. Appropriate gravel road maintenance can be deceptively expensive. Frequently, high level budget analysis proves that the per-kilometre cost of adequate gravel road maintenance is greater than the per-kilometre cost for hard top maintenance. This is further exacerbated as traffic volume on a gravel road increases.

Road agencies in both Canada and the United States have conducted studies that have generally indicated that, dependent upon local unit costs, gravel road conversion to hardtop can be a cost-effective management strategy. One source indicates that this may be effective management for roads with traffic volumes as low as 100 AADT.

A number of factors have to be assessed and analysed to render an appropriate decision such as:

- Traffic volumes
- Material costs
- Anticipated life cycle costs (and unit costs)
- Anticipated performance
- Current condition of the road, drainage, width, etc

With respect to traffic volumes,

- The Ministry of Transportation's Inventory Manual for Municipal Roads, 1991, deemed that a gravel road with over 400 AADT was a 'NOW' need and required a hard top surface
- Applied Research Technology prepared a report in 2002 for the United States Federal Highways Administration (USFHA) and the State of South Dakota, which determined that user costs were lower for roads with some type of hard surface vs roads with gravel or stabilized gravel surfaces
- The USFHA Gravel Roads Maintenance and Design Manual suggests in Appendix D of that document that the average daily volumes used to justify conversion to hard to range for 50 AADT to 400 AADT. Decisions are all reflective of assessed construction, maintenance and user costs.

If the argument for conversion may be made from a financial perspective, then there are additional factors that should be considered from physical and risk perspectives. Other factors for consideration include:

- Platform width
- Drainage
- Structural Adequacy
- Traffic Volume and Type

Conversion candidates should have a width that meets or exceeds the minimum standard width for the traffic volume of the road section plus minimum 0.5 metre shoulder, be ***structurally sound***, and have good drainage. Structural soundness may be obtained through geotechnical examination or documented past performance. A decision matrix for gravel road conversion may be found at the end of this document.

Benefits to converting a gravel road include:

- Customer satisfaction
- Reduced maintenance costs for routine maintenance
- Reduced maintenance costs for winter maintenance, dependent upon local practices
- Reduced complaints

Analysis Methods

Like other road assets, gravel roads have lifecycle maintenance and rehabilitation costs that should be addressed as part of any asset management plan. Life cycle costs include regular addition of gravel, dust control, grading and labour. Grading will typically include equipment costs for a motor grader.

There are a number of potential tools that may be used to assist in the analysis and decision to convert a gravel surface to hard. A Net Present Value Analysis (NPV) or a performance model are two methods that may be used to develop a decision.

Net Present Value (NPV) Analysis

Process

Given the above noted, a Net Present Value (NPV) assessment of the gravel road, in comparison with a surface treated road section or other hard top surface, should be undertaken as it may be more cost-effective to convert/upgrade the gravel road to a hard surface; typically surface treatment. The NPV analysis will compare the lifecycle costs for status quo and conversion assuming inflation rates and discounts rates for the analysis period.

It is preferable to address the cost comparisons over a period of time where the life cycles may conclude concurrently. For instance, if the gravel maintenance is on a three year basis and the surface treatment is seven, then the cycles coincide at 21 years. Total life cycle cost over that time period should be considered. Whatever other surface type is being compared with the gravel road surface should include the same factors as for gravel so there is a 1:1 comparison.

Equipment

As part of a holistic review of service delivery, consideration should be given to the equipment hourly rates and replacement. *Accurate* hourly rates are required to provide a true assessment. Equipment rates should include capital depreciation/replacement and operating costs.

One of the factors driving the overall cost is the equipment that is required to properly maintain a gravel road system - particularly graders. Part of the gravel road conversion analysis should include:

- Has the hourly rate for the equipment been calculated properly to include capital depreciation and maintenance costs?

  - A new grader will typically cost close to $500,000. At a 20-year life span, there is a minimum of $25,000 in annual capital depreciation alone on the grader. If the grader were replaced on a 10 year cycle, the annual capital depreciation would be $50,000.
  - What is the current rate for the grader? If there is not full cost recovery on the grader hourly rate, then the cost for gravel road maintenance is not accurate either.
- Is the grader used for any other purpose/activities?
- What is the length of the gravel road system? A commonly used measure to justify a grader is 75 kilometres of gravel for each grader.
- How many hours per year is the grader operated?
- Are there other pieces of equipment that could be used or rented to maintain the gravel roads?

As a rule of thumb, one grader is required for approximately 75 kilometres of gravel roads, dependent upon the distribution of the gravel roads across the system. The current replacement cost of a grader is in the $500,000 range and yearly usage may not be that high, which translates into a higher hourly rate for the equipment.

Performance Model -Gravel vs Surface Treatment

The following is a high level analysis using a performance model. Unit costs for this analysis are not specific to an individual agency but are representative of user costs experienced in 2020. Unit costs used for the evaluations are as follows.

Table 1: Unit Costs

Item ID	Description	Unit Price	Units
UPExcavate	Excavation	15	m3
UPGranA	Granular A	20	tonne
UPGranB	Granular B	15	tonne
UPDSurfTr	Double Surface Treatment	7	m2
UPSSurfTr	Single Surface Treatment	3.5	m2

Assumptions

- Both road sections are the same length
- Both were in the same initial condition
- Both were rehabilitated to the same standard, ditching, a total of 300mm of Granular material. In addition, one section received a double surface treated surface (the other remained as gravel)
- All calculations are in current dollars; no adjustments for inflation or discounts rates
- Gravel roads would receive a 75mm layer of gravel every 3 years.
  - At a lesser condition the gravel section would receive a 150mm lift.
- Surface treated roads would theoretically receive a re-treatment every 7 years
- Surface Treatment does not have a structural value
- Cost for gravel road regrading and dust control are not included

The discussion focuses on modelling 2 sections as described above.

The model is set to make decisions based on anticipated deterioration of the assets and an analysis of the best Return on Investment for the model and for the treatment selection. Formulae for the ROI analysis are as follows;

From the WorkTech Manual;

Scenario Return on Investment

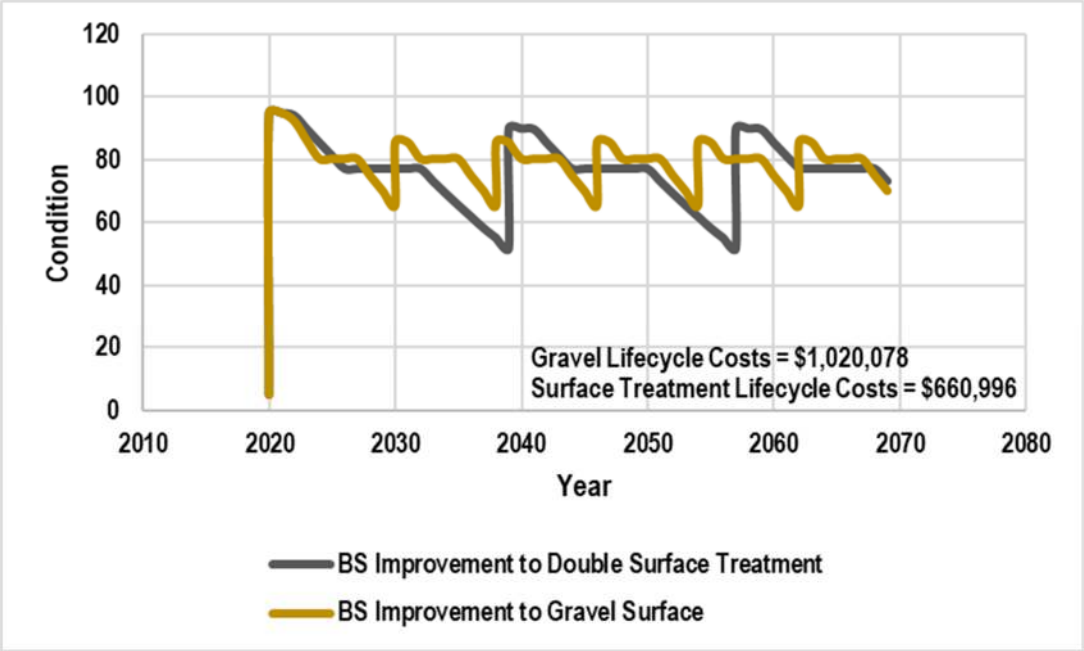
$$ROI = \frac{(End\ of\ Scenario\ Asset\ Value - Do\ Nothing\ Asset\ Value)}{Total\ Budget\ (all\ years)}$$

Improvement Type Return on Investment

$$ROI = \frac{(Value\ if\ Funded - Do\ Nothing\ Value)}{Improvement\ Cost.}$$

Deterioration curves are shown at the end of the document

Figure 1: Performance Model Output



The model shows a significant cost differential between the sections over the 50 year period

The payback period is approximately 12 years; the costs for both service delivery models are similar at this juncture. Going forward, the gravel costs contribute to a much higher life cycle cost.

For the gravel roads, the model initially selects a 75mm layer of material and then lets the condition deteriorate to the condition where 150mm of material is required. This sequence of events repeats throughout the remainder of the model.

For the surface treated road, the model treatment selection is similar. Initially it selects a single surface treatment, then allows the condition to reduce to the point where a surface treatment with some padding is required and the analysis shows it offered a better ROI.

This is a simple analysis. Analyses conducted by other sources have included vehicle costs, the aforementioned maintenance costs etc. Maintenance cost assessment should be conducted using appropriate equipment rates.

Asset Management Perspective

Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure, provides significant guidance in the development of the asset management plan and states in part

> *"4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:*
>
> *I. The full lifecycle of the assets.*
>
> *ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.*
>
> *iii. The risks associated with the options referred to in subparagraph ii.*
>
> *iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service."*

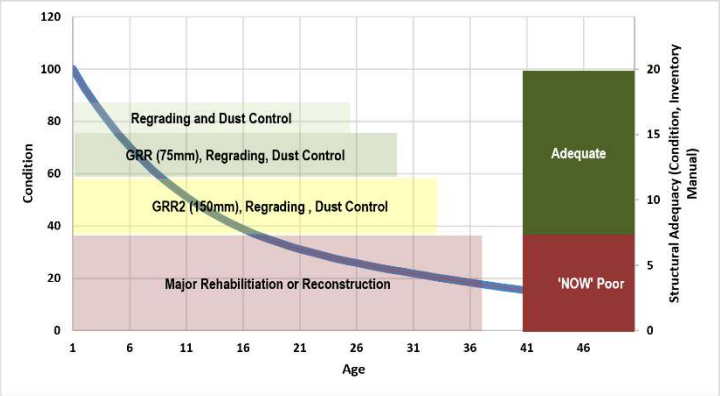
Figure 1 provides a graphic representation of the cost benefit of gravel road conversion to hard top on a life cycle basis. Given the directive of the regulation, gravel road conversion to hard top surface appears to be consistent with the regulation.

Gravel Road Conversion

Gravel Roads- All Roadsides, all AADT

Year	Condition	Imp Type	Description
1	100	NONE	No Improvement Required
2	92.45	NONE	No Improvement Required
3	86.21	GRR	75mm of Granular A
4	80.43	GRR	75mm of Granular A
5	75.11	GRR	75mm of Granular A
6	70.21	GRR	75mm of Granular A
7	65.7	GRR2	150mm of additional Gravel
8	61.55	GRR2	150mm of additional Gravel
9	57.75	GRR2	150mm of additional Gravel
10	54.27	GRR2	150mm of additional Gravel
11	51.07	GRR2	150mm of additional Gravel
12	48.15	GRR2	150mm of additional Gravel
13	45.48	GRR2	150mm of additional Gravel
14	43.04	GRR2	150mm of additional Gravel
15	40.81	GRR2	150mm of additional Gravel
16	38.77	GRR2	150mm of additional Gravel
17	36.9	GRR2	150mm of additional Gravel
18	35.2	GRR2	150mm of additional Gravel
19	33.63	REC	Reconstruction - Rural
20	32.19	REC	Reconstruction - Rural
21	30.86	REC	Reconstruction - Rural
22	29.64	REC	Reconstruction - Rural
23	28.51	REC	Reconstruction - Rural
24	27.45	REC	Reconstruction - Rural
25	26.47	REC	Reconstruction - Rural
30	22.28	REC	Reconstruction - Rural
35	18.88	REC	Reconstruction - Rural
40	20	REC	Reconstruction - Rural
45	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural

Every treatment will not be undertaken every year. The model will select the correct treatment based on the condition

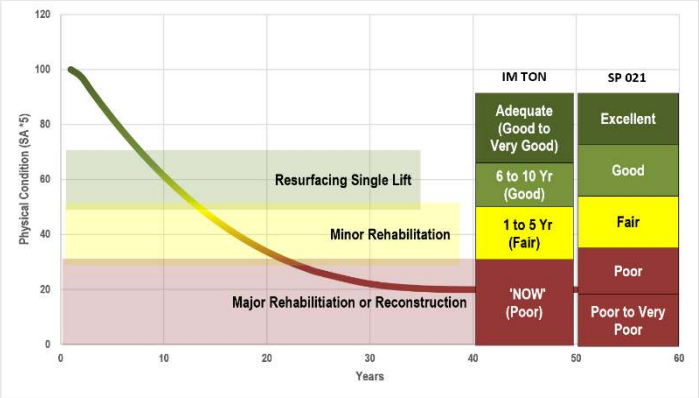


Gravel Road Conversion

LCB Roads- All Roadsides, all AADT

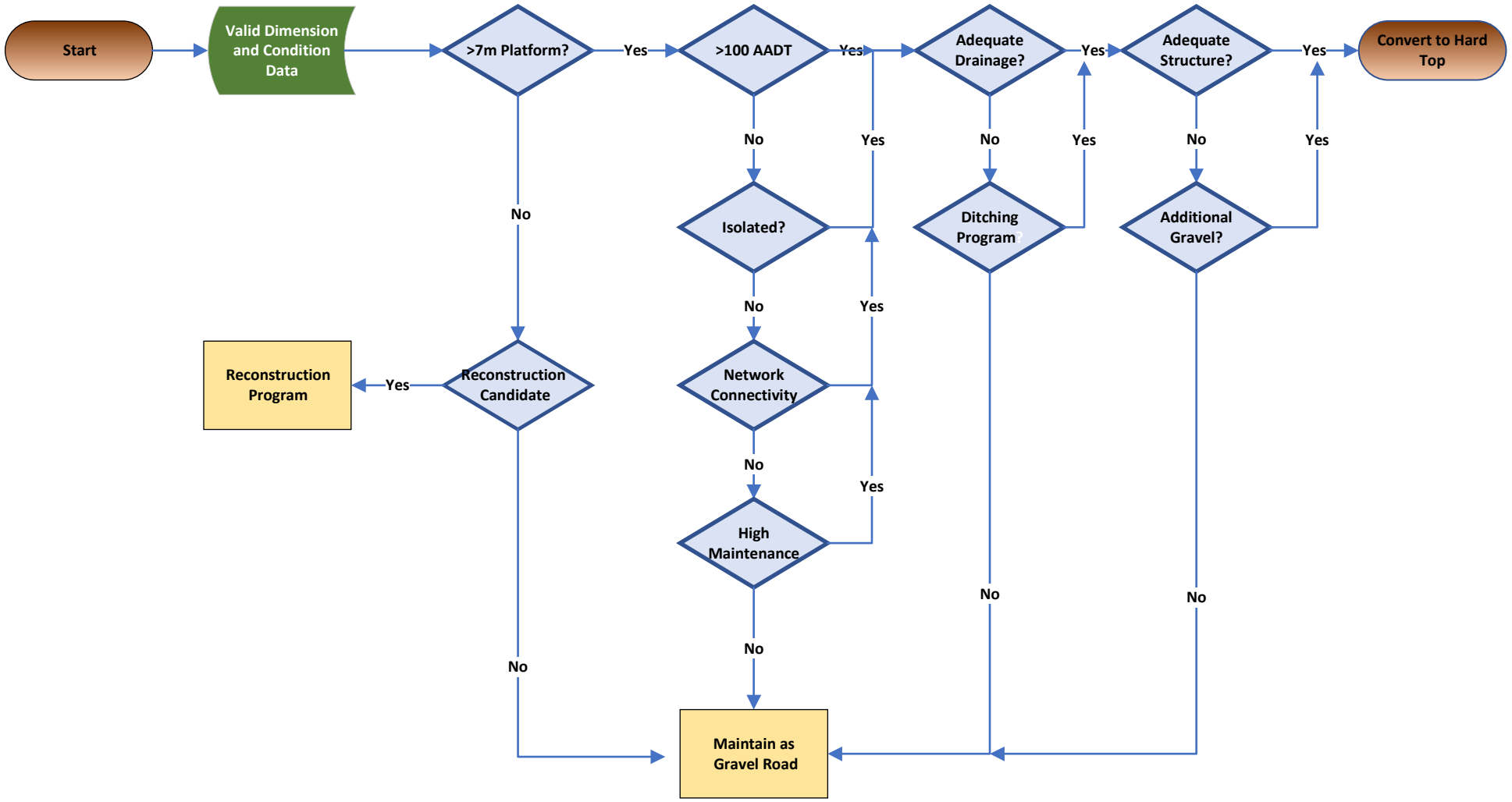
Year	Condition	Imp. Type	Description
1	100	NONE	No Improvement Required
2	98.61	NONE	No Improvement Required
3	94.19	NONE	No Improvement Required
4	89.84	NONE	No Improvement Required
5	85.56	NONE	No Improvement Required
6	81.36	NONE	No Improvement Required
7	77.26	SST	Single Surface Treatment
8	73.28	SST	Single Surface Treatment
9	69.4	SST	Single Surface Treatment
10	65.65	SST	Single Surface Treatment
11	62.02	SST	Single Surface Treatment
12	58.54	SST	Single Surface Treatment
13	55.19	SST	Single Surface Treatment
14	52	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
15	48.96	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
16	46.08	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
17	43.36	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
18	40.81	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
19	38.41	SSTplus	Single Surface Treatment plus 10% padding to correct geometry
20	36.19	REC	Reconstruction - Rural
21	34.13	REC	Reconstruction - Rural
22	32.24	REC	Reconstruction - Rural
23	30.51	REC	Reconstruction - Rural
24	28.95	REC	Reconstruction - Rural
25	27.55	REC	Reconstruction - Rural
30	22.82	REC	Reconstruction - Rural
35	21.31	REC	Reconstruction - Rural
40	21.92	REC	Reconstruction - Rural
45	20	REC	Reconstruction - Rural
50	20	REC	Reconstruction - Rural

Every treatment will not be undertaken every year. The model will select the correct treatment based on the condition



Well Constructed Gravel Road

Gravel Road Conversion Decision Matrix



4 ROADS
MANAGEMENT SERVICES

Appendix E: Regulation 588/17 – Asset Management Planning for Municipal Infrastructure

Ontario

Français

Infrastructure for Jobs and Prosperity Act, 2015

ONTARIO REGULATION 588/17

ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE

Consolidation Period: From March 15, 2021 to the e-Laws currency date.

Las amendment: 193/21.

Legislative History: [+]

This is the English version of a bilingual regulation.

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Interpretation and Application

Definitions

1. (1) In this Regulation,

"asset category" means a category of municipal infrastructure assets that is,

(a) an aggregate of assets described in each of clauses (a) to (e) of the definition of core municipal infrastructure asset, or

(b) composed of any other aggregate of municipal infrastructure assets that provide the same type of service; ("catégorie de biens")

"core municipal infrastructure asset" means any municipal infrastructure asset that is a,

(a) water asset that relates to the collection, production, treatment, storage, supply or distribution of water,

(b) wastewater asset that relates to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater,

(c) stormwater management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater,

(d) road, or

(e) bridge or culvert; ("bien d'infrastructure municipale essentiel")

"ecological functions" has the same meaning as in Ontario Regulation 140/02 (Oak Ridges Moraine Conservation Plan) made under the *Oak Ridges Moraine Conservation Act, 2001*; ("fonctions écologiques")

"green infrastructure asset" means an infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs; ("bien d'infrastructure verte")

"hydrological functions" has the same meaning as in Ontario Regulation 140/02; ("fonctions hydrologiques")

"joint municipal water board" means a joint board established in accordance with a transfer order made under the *Municipal Water and Sewage Transfer Act, 1997*; ("conseil mixte de gestion municipale des eaux")

"lifecycle activities" means activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities; ("activités relatives au cycle de vie")

"municipal infrastructure asset" means an infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board; ("bien d'infrastructure municipale")

"municipality" has the same meaning as in the *Municipal Act, 2001*; ("municipalité")

"operating costs" means the aggregate of costs, including energy costs, of operating a municipal infrastructure asset over its service life; ("frais d'exploitation")

"service life" means the total period during which a municipal infrastructure asset is in use or is available to be used; ("durée de vie")

"significant operating costs" means, where the operating costs with respect to all municipal infrastructure assets within an asset category are in excess of a threshold amount set by the municipality, the total amount of those operating costs. ("frais d'exploitation importants")

(2) In Tables 1 and 2,

"connection-days" means the number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue. ("jours-branchements")

(3) In Table 4,

"arterial roads" means Class 1 and Class 2 highways as determined under the Table to section 1 of Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) made under the *Municipal Act, 2001*; ("artères")

"collector roads" means Class 3 and Class 4 highways as determined under the Table to section 1 of Ontario Regulation 239/02; ("routes collectrices")

"lane-kilometre" means a kilometre-long segment of roadway that is a single lane in width; ("kilomètre de voie")

"local roads" means Class 5 and Class 6 highways as determined under the Table to section 1 of Ontario Regulation 239/02. ("routes locales")

(4) In Table 5,

"Ontario Structure Inspection Manual" means the Ontario Structure Inspection Manual (OSIM), published by the Ministry of Transportation and dated October 2000 (revised November 2003 and April 2008) and available on a Government of Ontario website; ("manuel d'inspection des structures de l'Ontario")

"structural culvert" has the meaning set out for "culvert (structural)" in the Ontario Structure Inspection Manual. ("ponceau structurel")

Application

2. For the purposes of section 6 of the Act, every municipality is prescribed as a broader public sector entity to which that section applies.

Strategic Asset Management Policies

Strategic asset management policy

3. (1) Every municipality shall prepare a strategic asset management policy that includes the following:

1. Any of the municipality's goals, policies or plans that are supported by its asset management plan.
2. The process by which the asset management plan is to be considered in the development of the municipality's budget or of any long-term financial plans of the municipality that take into account municipal infrastructure assets.
3. The municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning.
4. The principles to be followed by the municipality in its asset management planning, which must include the principles set out in section 3 of the Act.
5. The municipality's commitment to consider, as part of its asset management planning,
    i. the actions that may be required to address the vulnerabilities that may be caused by climate change to the municipality's infrastructure assets, in respect of such matters as,
        A. operations, such as increased maintenance schedules,
        B. levels of service, and
        C. lifecycle management,
    ii. the anticipated costs that could arise from the vulnerabilities described in subparagraph i,
    iii. adaptation opportunities that may be undertaken to manage the vulnerabilities described in subparagraph i,
    iv. mitigation approaches to climate change, such as greenhouse gas emission reduction goals and targets, and
    v. disaster planning and contingency funding.
6. A process to ensure that the municipality's asset management planning is aligned with any of the following financial plans:
    i. Financial plans related to the municipality's water assets including any financial plans prepared under the *Safe Drinking Water Act, 2002*.
    ii. Financial plans related to the municipality's wastewater assets.

7. A process to ensure that the municipality's asset management planning is aligned with Ontario's land-use planning framework, including any relevant policy statements issued under subsection 3 (1) of the *Planning Act*, any provincial plans as defined in the *Planning Act* and the municipality's official plan.
8. An explanation of the capitalization thresholds used to determine which assets are to be included in the municipality's asset management plan and how the thresholds compare to those in the municipality's tangible capital asset policy, if it has one.
9. The municipality's commitment to coordinate planning for asset management, where municipal infrastructure assets connect or are interrelated with those of its upper-tier municipality, neighbouring municipalities or jointly-owned municipal bodies.
10. The persons responsible for the municipality's asset management planning, including the executive lead.
11. An explanation of the municipal council's involvement in the municipality's asset management planning.
12. The municipality's commitment to provide opportunities for municipal residents and other interested parties to provide input into the municipality's asset management planning.

(2) For the purposes of this section,

"capitalization threshold" is the value of a municipal infrastructure asset at or above which a municipality will capitalize the value of it and below which it will expense the value of it. ("seuil de capitalisation")

Update of asset management policy

4. Every municipality shall prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five years.

Asset Management Plans

Asset management plans, current levels of service

5. (1) Every municipality shall prepare an asset management plan in respect of its core municipal infrastructure assets on or before July 1, 2022, and in respect of all of its other municipal infrastructure assets on or before July 1, 2024. O. Reg. 193/21, s. 1.

(2) A municipality's asset management plan must include the following:

1. For each asset category, the current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at most the two calendar years prior to the year in which all information required under this section is included in the asset management plan:
    i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
    ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency, and based on data from at most two calendar years prior to the year in which all information required under this section is included in the asset management plan.
3. For each asset category,
    i. a summary of the assets in the category,
    ii. the replacement cost of the assets in the category,
    iii. the average age of the assets in the category, determined by assessing the average age of the components of the assets,

iv. the information available on the condition of the assets in the category, and

v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.

4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:

i. The full lifecycle of the assets.

ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.

iii. The risks associated with the options referred to in subparagraph ii.

iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, the following:

i. A description of assumptions regarding future changes in population or economic activity.

ii. How the assumptions referred to in subparagraph i relate to the information required by paragraph 4.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census, the following:

i. With respect to municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are set out in Schedule 3 or 7 to the 2017 Growth Plan, those forecasts.

ii. With respect to lower-tier municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are not set out in Schedule 7 to the 2017 Growth Plan, the portion of the forecasts allocated to the lower-tier municipality in the official plan of the upper-tier municipality of which it is a part.

iii. With respect to upper-tier municipalities or single-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the municipality that are set out in its official plan.

iv. With respect to lower-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the lower-tier municipality that are set out in the official plan of the upper-tier municipality of which it is a part.

v. If, with respect to any municipality referred to in subparagraph iii or iv, the population and employment forecasts for the municipality cannot be determined as set out in those subparagraphs, a description of assumptions regarding future changes in population or economic activity.

vi. For each of the 10 years following the year for which the current levels of service under paragraph 1 are determined, the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets. O. Reg. 588/17, s. 5 (2).

(3) Every asset management plan must indicate how all background information and reports upon which the information required by paragraph 3 of subsection (2) is based will be made available to the public. O. Reg. 588/17, s. 5 (3).

(4) In this section,

"2017 Growth Plan" means the Growth Plan for the Greater Golden Horseshoe, 2017 that was approved under subsection 7 (6) of the *Places to Grow Act, 2005* on May 16, 2017 and came into effect on July 1, 2017; ("Plan de croissance de 2017")

"Greater Golden Horseshoe growth plan area" means the area designated by section 2 of Ontario Regulation 416/05 (Growth Plan Areas) made under the *Places to Grow Act, 2005*. ("zone de croissance planifiée de la région élargie du Golden Horseshoe") O. Reg. 588/17, s. 5 (4).

Asset management plans, proposed levels of service

6. (1) Subject to subsection (2), on or before July 1, 2025, every asset management plan prepared under section 5 must include the following additional information:

1. For each asset category, the levels of service that the municipality proposes to provide for each of the 10 years following the year in which all information required under section 5 and this section is included in the asset management plan, determined in accordance with the following qualitative descriptions and technical metrics:
    i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
    ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. An explanation of why the proposed levels of service under paragraph 1 are appropriate for the municipality, based on an assessment of the following:
    i. The options for the proposed levels of service and the risks associated with those options to the long term sustainability of the municipality.
    ii. How the proposed levels of service differ from the current levels of service set out under paragraph 1 of subsection 5 (2).
    iii. Whether the proposed levels of service are achievable.
    iv. The municipality's ability to afford the proposed levels of service.
3. The proposed performance of each asset category for each year of the 10-year period referred to in paragraph 1, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency.
4. A lifecycle management and financial strategy that sets out the following information with respect to the assets in each asset category for the 10-year period referred to in paragraph 1:
    i. An identification of the lifecycle activities that would need to be undertaken to provide the proposed levels of service described in paragraph 1, based on an assessment of the following:
        A. The full lifecycle of the assets.
        B. The options for which lifecycle activities could potentially be undertaken to achieve the proposed levels of service.
        C. The risks associated with the options referred to in sub-subparagraph B.

D. The lifecycle activities referred to in sub-subparagraph B that can be undertaken for the lowest cost to achieve the proposed levels of service.

ii. An estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities identified in subparagraph i, separated into capital expenditures and significant operating costs.

iii. An identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.

iv. If, based on the funding projected to be available, the municipality identifies a funding shortfall for the lifecycle activities identified in subparagraph i,

A. an identification of the lifecycle activities, whether set out in subparagraph i or otherwise, that the municipality will undertake, and

B. if applicable, an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities identified in subparagraph i.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, a discussion of how the assumptions regarding future changes in population and economic activity, set out in subparagraph 5 i of subsection 5 (2), informed the preparation of the lifecycle management and financial strategy referred to in paragraph 4 of this subsection.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census,

i. the estimated capital expenditures and significant operating costs to achieve the proposed levels of service as described in paragraph 1 in order to accommodate projected increases in demand caused by population and employment growth, as set out in the forecasts or assumptions referred to in paragraph 6 of subsection 5 (2), including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets,

ii. the funding projected to be available, by source, as a result of increased population and economic activity, and

iii. an overview of the risks associated with implementation of the asset management plan and any actions that would be proposed in response to those risks.

7. An explanation of any other key assumptions underlying the plan that have not previously been explained. O. Reg. 588/17, s. 6 (1); O. Reg. 193/21, s. 2 (1).

(2) With respect to an asset management plan prepared under section 5 on or before July 1, 2022, if the additional information required under this section is not included before July 1, 2024, the municipality shall, before including the additional information, update the current levels of service set out under paragraph 1 of subsection 5 (2) and the current performance measures set out under paragraph 2 of subsection 5 (2) based on data from the two most recent calendar years. O. Reg. 193/21, s. 2 (2).

Update of asset management plans

7. (1) Every municipality shall review and update its asset management plan at least five years after the year in which the plan is completed under section 6 and at least every five years thereafter.

(2) The updated asset management plan must comply with the requirements set out under paragraphs 1, 2 and 3 and subparagraphs 5 i and 6 i, ii, iii, iv and v of subsection 5 (2), subsection 5 (3) and paragraphs 1 to 7 of subsection 6 (1).

Endorsement and approval required

8. Every asset management plan prepared under section 5 or 6, or updated under section 7, must be,

(a) endorsed by the executive lead of the municipality; and

(b) approved by a resolution passed by the municipal council.

Annual review of asset management planning progress

9. (1) Every municipal council shall conduct an annual review of its asset management progress on or before July 1 in each year, starting the year after the municipality's asset management plan is completed under section 6.

(2) The annual review must address,

(a) the municipality's progress in implementing its asset management plan;

(b) any factors impeding the municipality's ability to implement its asset management plan; and

(c) a strategy to address the factors described in clause (b).

Public availability

10. Every municipality shall post its current strategic asset management policy and asset management plan on a website that is available to the public, and shall provide a copy of the policy and plan to any person who requests it.

TABLE 1
WATER ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system. 2. Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	1. Percentage of properties connected to the municipal water system. 2. Percentage of properties where fire flow is available.
Reliability	Description of boil water advisories and service interruptions.	1. The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system. *2.* The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.

TABLE 2
WASTEWATER ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	Percentage of properties connected to the municipal wastewater system.

Reliability	1. Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes. 2. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches. 3. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes. 4. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in paragraph 3. 5. Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	1. The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system. 2. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system. 3. The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.

TABLE 3
STORMWATER MANAGEMENT ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	1. Percentage of properties in municipality resilient to a 100-year storm. 2. Percentage of the municipal stormwater management system resilient to a 5-year storm.

TABLE 4
ROADS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 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-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres 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).

TABLE 5
BRIDGES AND CULVERTS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Percentage of bridges in the municipality with loading or dimensional restrictions.
Quality	1. Description or images of the condition of bridges and how this would affect use of the bridges. 2. Description or images of the condition of culverts and how this would affect use of the culverts.	1. For bridges in the municipality, the average bridge condition index value. 2. For structural culverts in the municipality, the average bridge condition index value.

11. Omitted (provides for coming into force of provisions of this Regulation).

Français

Appendix F: Sample Road Section

MUNICIPAL ROAD APPRAISAL

A. IDENTIFICATION

Road Name: Old Lakeshore Road
From: Lakeshore Road
To: Niven Road
Road Section No.: 01513
Length: 0.40 km:
Old Section No.:
Owner: 18404
Road Value: 378,499
Location
☐ Shared?
Special Designation:
Patrol:
Shared With:
MunicB
Owner Share: 100.00
Designation 2
Adjacent Road Section No.:
Year Assumed:

B. EXISTING CONDITIONS

Horizontal Alignment
Substandard Curves:
Substandard S.S.D.:

Vertical Alignment
Substandard Grades:
Substandard S.S.D.:

Right of Way Width
Existing: 0 m
Desirable: 0 m
Terrain: NF - Non R
Drainage: N - None

Roadside Env.: R
Existing Class: 200
Number of Lanes: 2.00
Surface Type: LCB
Platform Width: 7.00 m
Surface Width: 6.000 m
Median Width:
Shoulder Type:
Shoulder Width: 0.50

Curb/Gutter
Left: NC
Right: NC
Sidewalk Width Left: Right:
Boulevard Width Left: Right:
Parking:

Existing Surface Depth: 100
Existing Gran "A" Depth:
Existing Gran "B" Depth:

C. TRAFFIC DATA

Legal Speed Limit: 50
Avg. Operating Speed: 50
Traffic Operation: 2W
Route Designations
☐ Bus ☐ Truck Route
☐ School ☐ Bicycle
Load Restrictions: SA

Traffic Count		10 Year Traffic Forecast	
Year:	A-2020-E	Year:	2030
AADT:	50	AADT:	51
DHV Factor:	12.0 %	DHV Factor:	12.0 %
DHV:	6 vph	DHV:	6 vph
Trucks:	3.00 %	Trucks:	3.0 %
Peak Directional Split:	%	Capacity:	1,222 vph
10 Year Growth Factor:	1.02		

D. APPROVALS

Date: 2023-08-11 Inspected By: D. Anderson CET
Approved By:

MUNICIPAL ROAD APPRAISAL

E. ROAD NEEDS

Field	Max Points	Rating	Comments
Surface Condition	10.0	5	
Structural Adequacy	20.0	4	
Drainage	15.0	12	
Maint. Demand	10.0	1	
Horiz. Alignment	10.0	10	
Shoulder Width	10.0	1	
Surface Width	15.0	15	
Vert. Alignment	10.0	10	

F. FUNCTIONAL NEEDS

Field	Existing	Min Tolerable	Time of Need	Comments
Capacity	A	E	ADEQ	
Drainage	12	8	6-10	
Geometrics	50	45	ADEQ	
Structural Adequacy	4	8	NOW	
Surface Type	LCB	G/S,PRI	ADEQ	
Surface Width	6	5.5	ADEQ	

Impr.Class	Improvement	Description	Override?	Percent	Time of Need	Year	Base/ Const Cost
Const	BS	Base and Surface	☐ Override	100.00	NOW		185,358.84
					Const Subtotal:		**185,358.84**

G. ENGINEERING RECOMMENDATIONS

Year (Re)Constructed:
Design Class: 300
Design Width: 6.00 m

Ratings

Priority Rating: 25
Guide Number: 0
$/Vehicle km: 1.24

Improvement Length: 0.401 km
☐ Set Values Manually?
Time of Need: NOW
Improvement Type: BS Base and Surface

H. IMPROVEMENT COSTS

Total Base/Construction: **185,358.84**

TOTAL: 185,358.84
Owners Share: 185,358.84

Appendix G: Program from Performance Model

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2024	1	0	10190	Four Mile Creek Road	(to) Penner Street-to-Pleasant Lane	CRK	$ 732	85	85	2	$ 792,833	$ 792,833	0.285
2024	1	0	4255	Johnson Street	(to) Regent Street-to-King Street	CRK	$ 386	85	85	2	$ 417,280	$ 417,280	0.15
2024	1	0	720	Concession 2 Road	(to) Line 4 Road-to-Line 3 Road	CRK	$ 2,118	85	85	2	$ 1,284,417	$ 1,284,417	0.824
2024	1	0	1165	Sheppard Crescent	(to) 81- York Road-to-End	CRK	$ 380	85	85	2	$ 443,292	$ 443,292	0.148
2024	1	0	4610	Melville Street	(to) Ricardo Street-to-Delater Street	CRK	$ 180	85	85	2	$ 202,527	$ 202,527	0.07
2024	1	0	4615	Melville Street	(to) Delater Street-to-Lockhart Street	CRK	$ 180	85	85	2	$ 202,527	$ 202,527	0.07
2024	1	0	5000	Gate Street	(to) Queen Street-to-Prideaux Street	CRK	$ 396	85	85	2	$ 424,978	$ 424,978	0.154
2024	1	0	4275	Market Street	(to) King Street-to-West End	CRK	$ 146	85	85	2	$ 155,393	$ 155,393	0.057
2024	1	0	11000	Frontier Drive	(to) Bordeaux Drive-to-Pinot Trail (P)	CRK	$ 190	85	85	2	$ 201,737	$ 201,737	0.074
2024	1	0	4250	Johnson Street	(to) Victoria Street-to-Regent Street	CRK	$ 380	85	85	2	$ 403,475	$ 403,475	0.148
2024	1	0	10040	Bunny Glen Drive	(to) Creekside Drive-to-South End Cul De Sac	CRK	$ 316	85	85	2	$ 335,321	$ 335,321	0.123
2024	1	0	5010	Simcoe Street	(to) South End-to-Victoria Street	CRK	$ 167	85	85	2	$ 177,202	$ 177,202	0.065
2024	1	0	1115	Niven Road	(to) Village Road-to-Regional Road 55 - Niagara Stone Road	CRK	$ 1,686	85	85	2	$ 1,788,377	$ 1,788,377	0.656
2024	1	0	4551	Shaw's Lane	(to) 37m North of Albion (Private Rd)-to-King St	CRK	$ 522	85	85	2	$ 553,415	$ 553,415	0.203
2024	1	0	5375	Bay Berry Lane	(to) Bay Berry Lane (North)-to-West End Cul De Sac	CRK	$ 324	85	85	2	$ 343,499	$ 343,499	0.126
2024	1	0	5480	Tottenham Court	(to) Garrison Village Drive-to-East End Cul de sac	CRK	$ 378	85	85	2	$ 400,750	$ 400,750	0.147
2024	1	0	9070	Smallwood Crescent	(to) Queenston Road-to-Paxton Lane	CRK	$ 1,306	85	85	2	$ 1,384,902	$ 1,384,902	0.508
2024	1	0	5550	Samuel Street	(to) Niven Road-to-Garrison Village Drive	CRK	$ 373	85	85	2	$ 395,297	$ 395,297	0.145
2024	1	0	5370	Bay Berry Lane	(to) 87- Lakeshore Road-to-Bay Berry Lane (East)	CRK	$ 278	85	85	2	$ 294,428	$ 294,428	0.108
2024	1	0	4430	Mary Street	(to) Nassau Street-to-87- Mary Street	CRK	$ 326	90	90	2	$ 160,563	$ 160,563	0.127
2024	1	0	480	Line 8 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST++	$ 23,165	60	95		$ 409,609	$ 648,547	0.499
2024	1	0	1060	McNab Road	(to) Church Road-to-87- Lakeshore Road	SST++	$ 50,298	70	95		$ 1,349,151	$ 1,830,991	1.051
2024	1	0	530	Line 9 Road	(to) Concession 1 Road-to-Concession 2 Road	SST++	$ 49,347	65	95		$ 945,287	$ 1,381,574	1.063
2024	1	0	4620	Melville Street	(to) Lockhart Street-to-Riverbeach Drive	CRK	$ 162	80	80	2	$ 171,552	$ 171,552	0.063
2024	1	0	375	Line 6 Road	(to) Concession 5 Road-to-Regional Road 100 - Four Mile Creek Road	SST++	$ 63,026	65	95		$ 1,188,945	$ 1,737,689	1.337
2024	1	0	815	Concession 4 Road	(to) East and West Line-to-Hunter Road	SST++	$ 37,937	65	95		$ 694,515	$ 1,015,060	0.781
2024	1	0	810	Concession 4 Road	(to) Regional Road 55 - Niagara Stone Road-to-East and West Line	SST++	$ 21,463	65	95		$ 389,282	$ 568,950	0.385
2024	1	0	4245	Johnson Street	(to) Gate Street-to-Victoria Street	CRK	$ 380	80	80	2	$ 379,742	$ 379,742	0.148
2024	1	0	5025	Simcoe Street	(to) Anderson Lane-to-Anne Street	CRK	$ 601	80	80	2	$ 600,402	$ 600,402	0.234
2024	1	0	4625	Harmony Drive	(to) Charlotte Street-to-Lucia Court	CRK	$ 712	80	80	2	$ 710,732	$ 710,732	0.277
2024	1	0	4900	Regent Street	(to) Queen Street-to-Prideaux Street	CRK	$ 391	80	80	2	$ 390,005	$ 390,005	0.152
2024	1	0	1000	Townline Road	(to) Line 3 Road-to-Scott Street	SST+	$ 18,490	75	95		$ 571,958	$ 724,480	0.52
2024	1	0	995	Townline Road	(to) 83- Carleton Street-to-Line 3 Road	SST+	$ 21,050	75	95		$ 651,153	$ 824,794	0.592
2024	1	0	620	Concession 1 Road	(to) Arnold Road-to-Line 8 Road (West)	SST+	$ 5,704	75	95		$ 169,302	$ 214,449	0.165
2024	1	0	280	Line 3 Road	(to) Concession 2 Road-to-Concession 1 Road	SST+	$ 40,714	75	95		$ 1,161,638	$ 1,471,408	1.114
2024	1	0	165	Scott Street	(to) Stewart Road-to-McNab Road	SST++	$ 42,514	70	95		$ 904,996	$ 1,228,209	0.945
2024	1	0	485	Line 8 Road	(to) Concession 3 Road-to-Concession 2 Road	SST++	$ 49,394	70	95		$ 1,018,959	$ 1,382,873	1.064
2024	1	0	225	Line 2 Road	(to) Concession 3 Road-to-Concession 2 Road	SST++	$ 52,360	70	95		$ 1,074,842	$ 1,458,715	1.047
2024	1	0	310	Line 4 Road	(to) 0.1km East of 100- Four Mile Creek Road-to-Concession 3 Road	SST++	$ 47,959	60	95		$ 565,907	$ 896,020	0.959
2024	1	0	605	Mallette Crescent	(to) Melrose Drive-to-End	CRK	$ 655	75	75	2	$ 673,924	$ 673,924	0.255
2024	1	0	4185	Picton Street	(to) Davy Street-to-Wellington Street	CRK	$ 391	80	80	2	$ 458,398	$ 458,398	0.152
2024	1	0	4180	Picton Street	(to) King Street-to-Davy Street	CRK	$ 401	80	80	2	$ 437,877	$ 437,877	0.156
2024	1	0	782	Tanbark Road	(to) 200m N of Stoneridge Crescent-to-Line 9 Road	SST	$ 11,524	75	90		$ 304,527	$ 365,432	0.388
2024	1	0	980	Townline Road	(to) Queenston Road-to-0.15 North of Queenston Road	SST	$ 4,529	75	90		$ 118,718	$ 142,461	0.15
2024	1	0	10050	Red Haven Drive	(to) Bunny Glen Drive-to-Creekside Drive	CRK	$ 732	95	95	2	$ 868,370	$ 868,370	0.285
2024	1	0	11250	Stoneridge Crescent	(to) Tanbark Road-to-Stoneridge Crescent	CRK	$ 1,298	95	95	2	$ 1,538,690	$ 1,538,690	0.505
2024	1	0	29113	Brock Street	(to) Macdonell Road-to-Cooley Lane	CRK	$ 280	95	95	2	$ 332,113	$ 332,113	0.109
2024	1	0	4630	Harmony Drive	(to) Lucia Court-to-East End Cul de sac	CRK	$ 524	95	95	2	$ 621,570	$ 621,570	0.204
2024	1	0	4635	Lucia Court	(to) Harmony Drive-to-North End Cul De Sac	CRK	$ 434	95	95	2	$ 514,929	$ 514,929	0.169
2024	1	0	5015	Simcoe Street	(to) Victoria Street-to-Karsam Court	CRK	$ 293	95	95	2	$ 347,348	$ 347,348	0.114

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2024	1	0	9030	Wright Crescent	(to) Griffiths Gate-to-Haynes Court	CRK	$ 547	95	95	2	$ 648,993	$ 648,993	0.213
2024	1	0	11170	Garrison Village Drive	(to) Brock Street-to-Jordan Street	CRK	$ 324	95	95	2	$ 383,911	$ 383,911	0.126
2024	1	0	11010	Frontier Drive	(to) Pinot Trail (P)-to-West End	CRK	$ 72	90	90	2	$ 132,992	$ 132,992	0.028
2024	1	0	470	Line 8 Road	(to) Tanbark Road-to-0.2km West of Tanbark Road	SST++	$ 8,567	75	95		$ 141,584	$ 179,339	0.2
2024	1	0	4770	Cottage Street	(to) King Street-to-Rye Street	CRK	$ 213	85	85	2	$ 76,830	$ 76,830	0.083
2024	1	0	330	Line 5 Road	(to) Concession 6 Road-to-Concession 5 Road	SST++	$ 45,030	80	95		$ 1,061,644	$ 1,260,702	0.97
2024	1	0	925	Wagg Road	(to) East and West Line-to-North End Cul De Sac	SST	$ 27,682	75	90		$ 649,260	$ 779,112	0.902
2024	1	0	845	Concession 5 Road	(to) Line 6 Road-to-Line 5 Road	SST++	$ 39,645	70	95		$ 564,256	$ 765,776	0.854
2024	1	0	970	Concession 7 Road	(to) Line 2 Road-to-Line 1 Road	SST	$ 26,601	75	90		$ 619,058	$ 742,870	0.853
2024	1	0	960	Concession 7 Road	(to) Regional Road 55 - Niagara Stone Road-to-Line 3 Road	SST++	$ 36,674	70	95		$ 511,407	$ 694,052	0.755
2024	1	0	20	East and West Line	(to) 0.5km East of Concession Road 6-to-Regional Road 100 - Four Mile Cre	PR2	$ 129,286	30	100		$ 274,594	$ 915,313	0.456
2024	1	0	315	Line 4 Road	(to) Concession 3 Road-to-Concession 2 Road	SST++	$ 52,060	70	95		$ 716,678	$ 972,635	1.041
2024	1	0	5210	Palatine Place	(to) Johnson Street-to-Niagara Boulevard	CRK	$ 167	85	85	2	$ 55,293	$ 55,293	0.065
2024	1	0	1075	Read Road	(to) Carlton Street-to-Scott Street	PR2	$ 70,384	35	100		$ 175,223	$ 500,637	0.273
2024	1	0	435	Line 7 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST	$ 20,925	80	90		$ 519,438	$ 584,368	0.671
2024	1	0	965	Concession 7 Road	(to) Line 3 Road-to-Line 2 Road	SST	$ 26,258	80	90		$ 651,814	$ 733,290	0.842
2024	1	0	4270	Market Street	(to) Regent Street-to-East End	CRK	$ 118	90	90	2	$ 135,493	$ 135,493	0.046
2024	1	0	3175	Raiana Drive	(to) Annmarie Drive-to-Hope Avenue	CRK	$ 254	90	90	2	$ 285,768	$ 285,768	0.099
2024	1	0	11150	Brock Street	(to) Garrison Village Drive-to-Garrison Village Drive	CRK	$ 90	90	90	2	$ 101,030	$ 101,030	0.035
2024	1	0	11210	Sorenson Court	(to) Cul De Sac-to-Cul De Sac	CRK	$ 185	90	90	2	$ 207,832	$ 207,832	0.072
2024	1	0	4945	Victoria Street	(to) Johnson Street-to-Queen Street	CRK	$ 396	90	90	2	$ 444,529	$ 444,529	0.154
2024	1	0	5020	Simcoe Street	(to) Karsam Court-to-Anderson Lane	CRK	$ 373	90	90	2	$ 418,550	$ 418,550	0.145
2024	1	0	4950	Victoria Street	(to) Queen Street-to-Prideaux Street	CRK	$ 396	90	90	2	$ 444,529	$ 444,529	0.154
2024	1	0	4955	Victoria Street	(to) Prideaux Street-to-Front Street	CRK	$ 383	90	90	2	$ 430,096	$ 430,096	0.149
2024	1	1	855	Concession 6 Road	(to) Warner Road-to-Highway 405 Overpass	REC	$ 939,560	30	100		$ 140,879	$ 469,595	0.445
2024	1	1	860	Concession 6 Road	(to) Highway 405 Overpass-to-81- York Road	REC	$ 960,440	10	100		$ 43,307	$ 433,074	0.455
2024	1	1	870	Concession 6 Road	(to) Queenston Road-to-Line 8 Road	R1	$ 230,000	60	97		$ 735,627	$ 1,189,264	0.836
2024	1	1	880	Concession 6 Road	(to) Line 7 Road-to-Line 6 Road	R1	$ 230,000	90	97		$ 1,379,777	$ 1,487,092	0.836
2024	1	1	5150	Dorchester Street	(to) William Street-to-Centre Street	R1	$ 60,000	30	30		$ 44,435	$ 44,435	0.148
2024	1	1	5155	Dorchester Street	(to) Centre Street-to-Gage Street	R1	$ 60,000	55	55		$ 81,463	$ 81,463	0.148
							$ 3,524,122						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2025	1	0	5555	Elizabeth Street	(to) Niven Road-to-Garrison Village Drive	CRK	$ 457	89.73	89.73	2	$ 512,264	$ 512,264	0.178
2025	1	0	11220	Sorenson Court	(to) Concession 4 Road-to-Cul De Sac	CRK	$ 406	89.73	89.73	2	$ 454,707	$ 454,707	0.158
2025	1	0	3165	Annmarie Drive	(to) Line 2 Road-to-Raiana Drive	CRK	$ 447	89.73	89.73	2	$ 500,753	$ 500,753	0.174
2025	1	0	5540	McFarland Gate	(to) Colonel Butler Crescent-to-East End Cul de sac	CRK	$ 406	89.73	89.73	2	$ 454,707	$ 454,707	0.158
2025	1	0	11260	Angels Drive	(to) Warner Road-to-Tanbark Road	CRK	$ 887	89.73	89.73	2	$ 992,871	$ 992,871	0.345
2025	1	0	11140	Brock Street	(to) Garrison Village Drive-to-Blackbird Street	CRK	$ 116	89.73	89.73	2	$ 129,505	$ 129,505	0.045
2025	1	0	4530	Anne Street	(to) Gate Street-to-Victoria Street	CRK	$ 380	74.49	74.49	2	$ 114,222	$ 114,222	0.148
2025	1	0	4020	Delater Street	(to) King Street-to-Ball Street	CRK	$ 632	79.27	79.27	2	$ 207,201	$ 207,201	0.246
2025	1	0	5220	Orchard Drive	(to) Lakeview Street-to-Palatine Place	CRK	$ 285	79.27	79.27	2	$ 88,059	$ 88,059	0.111
2025	1	0	440	Line 7 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 32,744	77.27	90		$ 785,094	$ 914,436	1.05
2025	1	0	445	Line 7 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 33,836	77.27	90		$ 811,264	$ 944,917	1.085
2025	1	0	4200	Queen's Parade	(to) 0.40km East of Wellington Street-to-John Street	PR2	$ 270,985	33.54	100		$ 668,524	$ 1,993,214	0.993
2025	1	0	10	East and West Line	(to) Townline Road-to-Concession 6 Road	PR2	$ 574,697	28.74	100		$ 1,130,703	$ 3,934,248	2.027
2025	1	0	15	East and West Line	(to) Concession 6 Road-to-0.5km East of Concession Road 6	PR2	$ 141,761	28.74	100		$ 278,910	$ 970,461	0.5
2025	1	0	665	Concession 1 Road	(to) Line 2 Road-to-Line 1 Road	SD	$ 13,743	89.84	89.84	2	$ 1,380,619	$ 1,380,619	0.838
2025	1	0	475	Line 8 Road	(to) Tanbark Road-to-Regional Road 100 - Four Mile Creek Road	SST	$ 16,721	81.36	90		$ 432,354	$ 478,268	0.563
2025	1	0	675	Concession 2 Road	(to) 81- York Road-to-0.3km North of 81- York Road	SD	$ 4,920	73.76	73.76	2	$ 476,170	$ 476,170	0.3
2025	1	0	655	Concession 1 Road	(to) Line 4 Road-to-Line 3 Road	SD	$ 13,612	89.84	89.84	2	$ 1,093,573	$ 1,093,573	0.83
2025	1	0	650	Concession 1 Road	(to) Larkin Road-to-Line 4 Road	SD	$ 7,019	89.84	89.84	2	$ 526,055	$ 526,055	0.428
2025	1	0	4595	Niagara Street	(to) 0.13km South of Charlotte Street-to-East and West Line	SD	$ 5,199	79.56	79.56	2	$ 506,243	$ 506,243	0.317
2025	1	1	5080	Mississagua Street	(to) 87- Mary Street-to-William Street	RSS	$ 506,421	53.83	100		$ 125,007	$ 232,226	0.162
2025	1	1	5085	Mississagua Street	(to) William Street-to-Centre Street	RSS	$ 474,770	53.83	100		$ 114,204	$ 212,157	0.148
2025	1	1	5090	Mississagua Street	(to) Centre Street-to-Gage Street	RSS	$ 474,770	28.73	100		$ 60,953	$ 212,157	0.148
2025	1	1	5095	Mississagua Street	(to) Gage Street-to-Johnson Street	RSS	$ 474,770	53.83	100		$ 114,204	$ 212,157	0.148
2025	1	1	5100	Mississagua Street	(to) Johnson Street-to-Queen Street	RSS	$ 474,770	39.37	100		$ 82,265	$ 208,954	0.154
							$ 3,524,754						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2026	1	0	45	East and West Line	(to) Concession 3 Road-to-Concession 2 Road	PR2	$ 326,163	27.35	100		$ 575,338	$ 2,103,614	1.048
2026	1	0	1080	Read Road	(to) Scott Street-to-Church Road	PR2	$ 287,016	31.82	100		$ 623,601	$ 1,959,776	1.061
2026	1	0	1085	Read Road	(to) Church Road-to-87- Lakeshore Road	PR2	$ 342,200	31.82	100		$ 727,118	$ 2,285,097	1.162
2026	1	0	4195	Queen's Parade	(to) 0.15km East of Wellington Street-to-0.40km East of Wellington Street	PR2	$ 68,224	41.53	100		$ 208,404	$ 501,816	0.25
2026	1	0	805	Concession 4 Road	(to) Line 1 Road-to-Regional Road 55 - Niagara Stone Road	PR2	$ 128,174	27.75	100		$ 209,997	$ 756,745	0.516
2026	1	0	1010	Townline Road	(to) Line 2 Road-to-Line 1 Road	DSTrehab	$ 154,641	40.8	95		$ 482,874	$ 1,124,338	0.807
2026	1	0	40	East and West Line	(to) Regional Road 55 - Niagara Stone Road-to-Concession 3 Road	PR2	$ 215,367	31.82	100		$ 418,409	$ 1,314,923	0.692
2026	1	0	3140	Elden Street	(to) Penner Street-to-North End Cul De Sac	R2	$ 97,692	27.75	100		$ 152,193	$ 548,444	0.171
2026	1	0	355	Browns Point Circle	(to) Niagara River Parkway-to-West End Cul De Sac	R2	$ 126,257	32.98	100		$ 233,765	$ 708,808	0.221
2026	1	0	940	Concession 7 Road	(to) Line 8 Road-to-Line 7 Road	PR2	$ 229,887	32.24	100		$ 411,169	$ 1,275,339	0.844
2026	1	0	645	Concession 1 Road	(to) Line 5 Road-to-Larkin Road	SST++	$ 20,450	85.56	95		$ 492,799	$ 547,171	0.421
2026	1	0	545	Queenston Road	(to) Coon Road-to-Regional Road 90- Airport Road	PR2	$ 218,984	36.19	100		$ 458,036	$ 1,265,642	0.863
2026	1	0	250	Line 3 Road	(to) 0.1km West of 55- Niagara Stone Road-to-Regional Road 55 - Niagara S	PR2	$ 26,807	10	100		$ 11,195	$ 111,949	0.1
2026	1	0	1015	Townline Road	(to) Line 1 Road-to-East and West Line	DSTrehab	$ 177,253	48.96	95		$ 664,176	$ 1,288,740	0.925
2026	1	0	935	Concession 7 Road	(to) Queenston Road-to-Line 8 Road	PR2	$ 219,061	36.19	100		$ 442,952	$ 1,223,963	0.81
2026	1	0	680	Concession 2 Road	(to) 0.3km North of 81- York Road-to-Line 9 Road	R1	$ 93,100	56.54	81.54		$ 691,158	$ 996,764	0.605
2026	1	0	25	East and West Line	(to) Regional Road 100 - Four Mile Creek Road-to-0.4km East of 100- Four M	R1	$ 61,727	65.01	90.01		$ 521,969	$ 722,696	0.4
2026	1	0	30	East and West Line	(to) 0.4km East of 100- Four Mile Creek Road-to-Concession 4 Road	R1	$ 98,455	65.01	90.01		$ 832,541	$ 1,152,700	0.638
2026	1	0	945	Concession 7 Road	(to) Line 7 Road-to-Line 6 Road	PR2	$ 216,224	40.8	100		$ 513,283	$ 1,258,047	0.845
2026	1	0	145	Line 1 Road	(to) Concession 3 Road-to-Concession 2 Road	DSTrehab	$ 227,817	40.8	95		$ 585,535	$ 1,363,377	1.049
2026	1	0	5	East and West Line	(to) 87- Lakeshore Road-to-Townline Road	PR2	$ 71,731	51.19	100		$ 251,370	$ 491,053	0.253
2026	1	0	490	Line 8 Road	(to) Concession 2 Road-to-Concession 1 Road	SD	$ 17,564	85.56	85.56	2	$ 1,253,653	$ 1,253,653	1.071
2026	1	0	640	Concession 1 Road	(to) Line 6 Road (West)-to-Line 5 Road	SD	$ 13,727	85.56	85.56	2	$ 979,746	$ 979,746	0.837
2026	1	0	385	Line 6 Road	(to) Concession 3 Road-to-Concession 2 Road	SD	$ 17,040	85.56	85.56	2	$ 1,216,195	$ 1,216,195	1.039
2026	1	0	105	Line 1 Road	(to) Concession 6 Road-to-Homestead Drive	SD	$ 8,643	69.4	69.4	2	$ 544,515	$ 544,515	0.527
2026	1	0	300	Line 4 Road	(to) 1.0km West of 100- Four Mile Creek Road-to-Regional Road 100 - Four	SD	$ 17,712	80.43	80.43	2	$ 909,022	$ 909,022	1.08
2026	1	0	1035	Irvine Road	(to) Church Road-to-Lakeshore Road	SD	$ 18,024	77.27	77.27	2	$ 1,171,233	$ 1,171,233	1.099
2026	1	0	630	Concession 1 Road	(to) Line 7 Road-to-Line 6 Road (East)	SD	$ 9,250	77.27	77.27	2	$ 596,221	$ 596,221	0.564
2026	1	0	380	Line 6 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SD	$ 13,497	77.27	77.27	2	$ 870,017	$ 870,017	0.823
2026	1	0	4205	Johnson Street	(to) Niagara Boulevard-to-Palatine Place	SD	$ 1,017	94.19	94.19	2	$ 67,203	$ 67,203	0.062
2026	1	0	4790	Ball Street	(to) Ricardo Street-to-Delater Street	SD	$ 1,164	94.19	94.19	2	$ 73,756	$ 73,756	0.071
							$ 3,524,868						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2027	1	0	9040	Garrison Village Drive	(to) Samuel Street-to-Garrison Village Drive	CRK	$ 71	83.76	83.76	2	$ 129,645	$ 129,645	0.055
2027	1	0	210	Line 2 Road	(to) Hope Avenue-to-Annmarie Drive	CRK	$ 257	73.76	73.76	2	$ 243,334	$ 243,334	0.1
2027	1	0	215	Line 2 Road	(to) Annmarie Drive-to-Concession 4 Road	CRK	$ 504	73.76	73.76	2	$ 476,934	$ 476,934	0.196
2027	1	0	800	Concession 4 Road	(to) Loretta Drive-to-Line 1 Road	CRK	$ 329	79.56	79.56	2	$ 338,627	$ 338,627	0.128
2027	1	0	5395	Garrison Village Drive	(to) Colonel Butler Crescent-to-Westgate Drive	CRK	$ 391	73.76	73.76	2	$ 362,522	$ 362,522	0.152
2027	1	0	5385	Village Drive, NOTL	(to) Niven Road-to-Garrison Village Drive	CRK	$ 200	73.76	73.76	2	$ 184,524	$ 184,524	0.078
2027	1	0	3235	Loretta Drive	(to) Bianca Drive-to-Concession 4 Road	CRK	$ 293	73.76	73.76	2	$ 269,688	$ 269,688	0.114
2027	1	0	135	Line 1 Road	(to) Casselman Boulevard-to-Concession 4 Road	CRK	$ 519	82.4	82.4	2	$ 546,930	$ 546,930	0.202
2027	1	0	130	Line 1 Road	(to) Regional Road 55 - Niagara Stone Road-to-Casselman Boulevard	CRK	$ 753	82.4	82.4	2	$ 793,319	$ 793,319	0.293
2027	1	0	4580	Niagara Street	(to) Rye Street-to-Green Street	CRK	$ 717	79.56	79.56	2	$ 711,927	$ 711,927	0.279
2027	1	0	3245	Casselman Boulevard	(to) Loretta Drive-to-Line 1 Road	CRK	$ 329	79.56	79.56	2	$ 326,618	$ 326,618	0.128
2027	1	0	4700	Charlotte Street	(to) Paffard Street-to-Weatherstone Court	CRK	$ 54	79.56	79.56	2	$ 53,586	$ 53,586	0.021
2027	1	0	4710	Charlotte Street	(to) Christopher Street-to-John Street East	CRK	$ 463	79.56	79.56	2	$ 459,308	$ 459,308	0.18
2027	1	0	4695	Charlotte Street	(to) The Promenade (North)-to-Paffard Street	CRK	$ 355	79.56	79.56	2	$ 352,136	$ 352,136	0.138
2027	1	0	4705	Charlotte Street	(to) Weatherstone Court-to-Christopher Street	CRK	$ 265	79.56	79.56	2	$ 262,826	$ 262,826	0.103
2027	1	0	5390	Garrison Village Drive	(to) 87- Lakeshore Road-to-Colonel Butler Crescent	CRK	$ 167	82.4	82.4	2	$ 173,185	$ 173,185	0.065
2027	1	0	3225	Loretta Drive	(to) Fisher Drive-to-Casselman Boulevard	CRK	$ 262	82.4	82.4	2	$ 269,565	$ 269,565	0.102
2027	1	0	125	Penner Street	(to) Elden Street-to-Regional Road 55 - Niagara Stone Road	CRK	$ 699	82.4	82.4	2	$ 718,840	$ 718,840	0.272
2027	1	0	120	Penner Street	(to) Four Mile Creek Road-to-Elden Street	CRK	$ 738	82.4	82.4	2	$ 758,482	$ 758,482	0.287
2027	1	0	4690	Charlotte Street	(to) James Street-to-The Promenade (North)	CRK	$ 193	82.4	82.4	2	$ 198,210	$ 198,210	0.075
2027	1	0	795	Concession 4 Road	(to) Diana Drive-to-Loretta Drive	CRK	$ 897	87.88	87.88	2	$ 1,015,823	$ 1,015,823	0.349
2027	1	0	205	Line 2 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Hope Avenue	CRK	$ 1,313	87.88	87.88	2	$ 1,481,468	$ 1,481,468	0.511
2027	1	0	4590	Niagara Street	(to) Charlotte Street-to-0.13km South of Charlotte Street	CRK	$ 357	87.88	87.88	2	$ 399,782	$ 399,782	0.139
2027	1	0	4672	Charlotte Street	(to) Campbell Street-to-Harmony Drive	CRK	$ 136	87.88	87.88	2	$ 149,384	$ 149,384	0.053
2027	1	0	4675	Charlotte Street	(to) Harmony Drive-to-The Promenade (South)	CRK	$ 403	87.88	87.88	2	$ 442,513	$ 442,513	0.157
2027	1	0	9020	Griffiths Gate	(to) Wright Crescent-to-Glendale Avenue East	CRK	$ 190	87.88	87.88	2	$ 208,573	$ 208,573	0.074
2027	1	0	4685	Charlotte Street	(to) Flynn Street-to-James Street	CRK	$ 316	87.88	87.88	2	$ 346,682	$ 346,682	0.123
2027	1	0	4680	Charlotte Street	(to) The Promenade (South)-to-Flynn Street	CRK	$ 386	87.88	87.88	2	$ 422,783	$ 422,783	0.15
2027	1	0	4160	Queen Street	(to) Simcoe Street-to-Gate Street	CRK	$ 571	82.4	82.4	2	$ 546,464	$ 546,464	0.148
2027	1	0	5421	Garrison Village Drive	(to) Samuel Street-to-Elizabeth Street	CRK	$ 54	94.55	94.55	2	$ 111,755	$ 111,755	0.042
2027	1	0	10180	Four Mile Creek Road	(to) Field Road-to-Penner Street	CRK	$ 504	92.95	92.95	2	$ 596,243	$ 596,243	0.196
2027	1	0	3040	Frontier Drive	(to) Hearth Court-to-Bordeaux Drive	CRK	$ 290	74.48	74.48	2	$ 269,932	$ 269,932	0.113
2027	1	0	3180	Raiana Drive	(to) Hope Avenue-to-South End Cul De Sac	CRK	$ 501	74.48	74.48	2	$ 465,812	$ 465,812	0.195
2027	1	0	5490	Loyalist Court	(to) Colonel Butler Crescent-to-West End Cul De Sac	CRK	$ 388	74.48	74.48	2	$ 360,706	$ 360,706	0.151
2027	1	0	4040	Front Street	(to) Gate Street-to-Victoria Street	CRK	$ 383	74.48	74.48	2	$ 355,928	$ 355,928	0.149
2027	1	0	3105	Cherry Street	(to) Andres Street-to-Henry Street	CRK	$ 270	74.48	74.48	2	$ 250,822	$ 250,822	0.105
2027	1	0	3115	Andres Street	(to) Henry Street-to-Line 2 Road	CRK	$ 517	74.48	74.48	2	$ 480,144	$ 480,144	0.201
2027	1	0	5495	Colonel Butler Crescent	(to) Garrison Village Drive-to-Northgate Circle	CRK	$ 278	74.48	74.48	2	$ 257,988	$ 257,988	0.108
2027	1	0	5510	Colonel Butler Crescent	(to) Upper Canada Drive-to-McFarland Gate	CRK	$ 188	74.48	74.48	2	$ 174,381	$ 174,381	0.073
2027	1	0	3155	Lorraine Street	(to) Regional Road 100 - Four Mile Creek Road-to-East End Cul de sac	CRK	$ 874	92.95	92.95	2	$ 1,013,596	$ 1,013,596	0.34
2027	1	0	4670	Charlotte Street	(to) Niagara Street-to-Harmony Drive	CRK	$ 270	92.95	92.95	2	$ 313,022	$ 313,022	0.105
2027	1	0	5422	Garrison Village Drive	(to) Elizabeth Street-to-Colonel Cohoe Street	CRK	$ 283	92.95	92.95	2	$ 327,928	$ 327,928	0.11
2027	1	0	9060	Street B	(to) Homer Road-to-East End	CRK	$ 604	83.76	83.76	2	$ 698,362	$ 698,362	0.235
2027	1	0	770	Tanbark Road	(to) Warner Road-to-Regional Road 81- York Road	CRK	$ 403	83.76	83.76	2	$ 463,389	$ 463,389	0.157
2027	1	0	765	Tanbark Road	(to) South End Cul De Sac-to-Warner Road	CRK	$ 2,328	83.76	83.76	2	$ 2,674,078	$ 2,674,078	0.906
2027	1	0	4165	Queen Street	(to) Gate Street-to-Victoria Street	CRK	$ 578	92.95	92.95	2	$ 654,942	$ 654,942	0.15
2027	1	0	4175	Queen Street	(to) Regent Street-to-King Street	CRK	$ 586	92.95	92.95	2	$ 663,675	$ 663,675	0.152
2027	1	0	4170	Queen Street	(to) Victoria Street-to-Regent Street	CRK	$ 567	92.95	92.95	2	$ 641,844	$ 641,844	0.147
2027	1	0	3145	Field Road	(to) Regional Road 100 - Four Mile Creek Road-to-Elden Street	CRK	$ 506	79.27	79.27	2	$ 500,854	$ 500,854	0.197
2027	1	0	4560	Paffard Street	(to) Rye Street-to-Charlotte Street	CRK	$ 750	79.27	79.27	2	$ 742,383	$ 742,383	0.292

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2027	1	0	4765	Rye Street	(to) Flynn Street-to-Paffard Street	CRK	$ 524	79.27	79.27	2	$ 518,651	$ 518,651	0.204
2027	1	0	5485	Northgate Circle	(to) Colonel Butler Crescent-to-South End Cul De Sac	CRK	$ 429	79.27	79.27	2	$ 424,582	$ 424,582	0.167
2027	1	0	10060	Creekside Drive	(to) Red Haven Drive-to-Four Mile Creek Road	CRK	$ 591	79.27	79.27	2	$ 584,753	$ 584,753	0.23
2027	1	0	3160	Hope Avenue	(to) Line 2 Road-to-Raiana Drive	CRK	$ 447	79.27	79.27	2	$ 442,379	$ 442,379	0.174
2027	1	0	3240	Fisher Drive	(to) Loretta Drive-to-Loretta Drive	CRK	$ 591	79.27	79.27	2	$ 584,753	$ 584,753	0.23
2027	1	0	5500	Colonel Butler Crescent	(to) Northgate Circle-to-Loyalist Court	CRK	$ 609	79.27	79.27	2	$ 602,550	$ 602,550	0.237
2027	1	0	3230	Loretta Drive	(to) Casselman Boulevard-to-Bianca Drive	CRK	$ 221	79.27	79.27	2	$ 218,647	$ 218,647	0.086
2027	1	0	4910	Victoria Street	(to) Simcoe Street-to-Anne Street	CRK	$ 974	79.27	79.27	2	$ 963,573	$ 963,573	0.379
2027	1	0	5475	Southgate Circle	(to) Upper Canada Drive-to-North End Cul De Sac	CRK	$ 311	79.27	79.27	2	$ 307,631	$ 307,631	0.121
2027	1	0	3110	Andres Street	(to) Cherry Street-to-Henry Street	CRK	$ 468	79.27	79.27	2	$ 462,718	$ 462,718	0.182
2027	1	0	4750	Park Court	(to) John Street East-to-John Street East	CRK	$ 851	79.27	79.27	2	$ 841,537	$ 841,537	0.331
2027	1	0	5505	Colonel Butler Crescent	(to) Loyalist Court-to-Upper Canada Drive	CRK	$ 288	79.27	79.27	2	$ 284,750	$ 284,750	0.112
2027	1	0	4035	Front Street	(to) Simcoe Street-to-Gate Street	CRK	$ 373	79.27	79.27	2	$ 368,649	$ 368,649	0.145
2027	1	0	9042	Samuel Street	(to) Garrison Village Drive-to-Garrison Village Drive	CRK	$ 64	83.76	83.76	2	$ 67,160	$ 67,160	0.025
2027	1	0	3190	Diana Drive	(to) Bianca Drive-to-Annmarie Drive	CRK	$ 123	83.76	83.76	2	$ 128,948	$ 128,948	0.048
2027	1	0	4760	Rye Street	(to) Cottage Street-to-Flynn Street	CRK	$ 290	83.76	83.76	2	$ 303,565	$ 303,565	0.113
2027	1	0	5465	Upper Canada Drive	(to) Southgate Circle-to-Confederation Drive	CRK	$ 113	83.76	83.76	2	$ 118,202	$ 118,202	0.044
2027	1	0	10055	Creekside Drive	(to) Bunny Glen Drive-to-Red Haven Drive	CRK	$ 203	83.76	83.76	2	$ 212,227	$ 212,227	0.079
2027	1	0	3185	Diana Drive	(to) Concession 4 Road-to-Bianca Drive	CRK	$ 329	83.76	83.76	2	$ 343,861	$ 343,861	0.128
2027	1	0	4390	William Street	(to) Chautauqua Amphitheatre-to-Nassau Street	CRK	$ 712	83.76	83.76	2	$ 744,136	$ 744,136	0.277
2027	1	0	4405	William Street	(to) Butler Street-to-Mississagua Street	CRK	$ 396	83.76	83.76	2	$ 413,708	$ 413,708	0.154
2027	1	0	5425	Westgate Drive	(to) Garrison Village Drive-to-West End	CRK	$ 121	83.76	83.76	2	$ 126,262	$ 126,262	0.047
2027	1	0	4555	Paffard Street	(to) King Street-to-Rye Street	CRK	$ 206	83.76	83.76	2	$ 214,913	$ 214,913	0.08
2027	1	0	790	Concession 4 Road	(to) Line 2 Road-to-Diana Drive	CRK	$ 938	89.73	89.73	2	$ 1,084,759	$ 1,084,759	0.365
2027	1	0	5525	Colonel Butler Crescent	(to) Merritt Circle-to-25m North of Cooley Crescent	CRK	$ 172	89.73	89.73	2	$ 192,818	$ 192,818	0.067
2027	1	0	4895	Regent Street	(to) Johnson Street-to-Queen Street	CRK	$ 398	89.73	89.73	2	$ 446,073	$ 446,073	0.155
2027	1	0	1220	Cole Crescent	(to) Robertson Road-to-Stevens Drive	CRK	$ 167	89.73	89.73	2	$ 187,063	$ 187,063	0.065
2027	1	0	1225	Cole Crescent	(to) Stevens Drive-to-Stevens Drive	CRK	$ 925	89.73	89.73	2	$ 1,036,040	$ 1,036,040	0.36
2027	1	0	5380	Bay Berry Lane	(to) Bay Berry Lane (North)-to-East End Cul de sac	CRK	$ 609	89.73	89.73	2	$ 682,059	$ 682,059	0.237
2027	1	0	5520	Colonel Butler Crescent	(to) Laura Secord Place-to-Merritt Circle	CRK	$ 334	89.73	89.73	2	$ 374,126	$ 374,126	0.13
2027	1	0	5535	Laura Secord Place	(to) Colonel Butler Crescent-to-East End Cul de sac	CRK	$ 393	89.73	89.73	2	$ 440,317	$ 440,317	0.153
2027	1	0	3220	Loretta Drive	(to) Fisher Drive-to-Fisher Drive	CRK	$ 1,380	89.73	89.73	2	$ 1,545,426	$ 1,545,426	0.537
2027	1	0	1200	Stevens Drive	(to) Niagara-on-the-Green Boulevard-to-Cole Crescent	CRK	$ 144	89.73	89.73	2	$ 161,161	$ 161,161	0.056
2027	1	0	1205	Stevens Drive	(to) Cole Crescent-to-Cole Crescent	CRK	$ 486	89.73	89.73	2	$ 543,921	$ 543,921	0.189
2027	1	0	1215	Cole Crescent	(to) Niagara-on-the-Green Boulevard-to-Robertson Road	CRK	$ 648	89.73	89.73	2	$ 725,228	$ 725,228	0.252
2027	1	0	3135	Elden Street	(to) Field Road-to-Penner Street	CRK	$ 427	89.73	89.73	2	$ 477,730	$ 477,730	0.166
2027	1	0	5515	Colonel Butler Crescent	(to) McFarland Gate-to-Laura Secord Place	CRK	$ 301	89.73	89.73	2	$ 336,713	$ 336,713	0.117
2027	1	0	5530	Merritt Circle	(to) Colonel Butler Crescent-to-East End Cul de sac	CRK	$ 368	89.73	89.73	2	$ 411,538	$ 411,538	0.143
2027	1	0	50	East and West Line	(to) Concession 2 Road-to-Niagara Street	CRK	$ 1,159	82.4	82.4	2	$ 745,948	$ 745,948	0.451
2027	1	0	60	East and West Line	(to) Concession 1 Road-to-Niagara River Parkway	CRK	$ 2,231	82.4	82.4	2	$ 1,388,209	$ 1,388,209	0.868
2027	1	0	695	Concession 2 Road	(to) Line 8 Road-to-Line 7 Road	CRK	$ 2,169	73.76	73.76	2	$ 1,141,625	$ 1,141,625	0.844
2027	1	0	5005	Gate Street	(to) Prideaux Street-to-Front Street	CRK	$ 380	94.55	94.55	2	$ 454,307	$ 454,307	0.148
2027	1	0	24272	Annmarie Drive	(to) Diana Drive-to-Paradise Grove	CRK	$ 303	94.55	94.55	2	$ 357,833	$ 357,833	0.118
2027	1	0	3150	Field Road	(to) Elden Street-to-Regional Road 55 - Niagara Stone Road	CRK	$ 267	94.55	94.55	2	$ 315,378	$ 315,378	0.104
2027	1	0	11090	Kirby Street	(to) Brock Street-to-Macdonell Road	CRK	$ 406	94.55	94.55	2	$ 479,132	$ 479,132	0.158
2027	1	0	11160	Garrison Village Drive	(to) Garrison Village Drive-to-Brock Street	CRK	$ 221	94.55	94.55	2	$ 260,793	$ 260,793	0.086
2027	1	0	3045	Bordeaux Drive	(to) Frontier Drive-to-Line 2 Road	CRK	$ 568	94.55	94.55	2	$ 670,178	$ 670,178	0.221
2027	1	0	4283	Gage Street	(to) Palatine Place-to-Nassau Street	CRK	$ 753	94.55	94.55	2	$ 888,517	$ 888,517	0.293
2027	1	0	4345	Hampton Court	(to) Nassau Street-to-West End Cul De Sac	CRK	$ 383	94.55	94.55	2	$ 451,839	$ 451,839	0.149
2027	1	0	4673	Campbell Street	(to) Charlotte Street-to-Green Street	CRK	$ 365	94.55	94.55	2	$ 430,612	$ 430,612	0.142

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2027	1	0	11110	Jordan Street	(to) Blackbird Street-to-Norton Street	CRK	$ 198	94.55	94.55	2	$ 233,501	$ 233,501	0.077
2027	1	0	25773	Mulberry Lane	(to) Copper Beach Boulevard-to-End	CRK	$ 198	94.55	94.55	2	$ 233,501	$ 233,501	0.077
2027	1	0	28879	Pierpoint Drive	(to) Summerhayes Drive-to-Line 2 Road	CRK	$ 288	94.55	94.55	2	$ 339,638	$ 339,638	0.112
2027	1	0	4100	Prideaux Street	(to) Victoria Street-to-Regent Street	CRK	$ 378	94.55	94.55	2	$ 445,775	$ 445,775	0.147
2027	1	0	11200	Evergreen Lane	(to) King Street-to-West End	CRK	$ 337	94.55	94.55	2	$ 397,255	$ 397,255	0.131
2027	1	0	25771	Mulberry Lane	(to) Niagara Stone Road-to-Copper Beach Boulevard	CRK	$ 193	94.55	94.55	2	$ 227,436	$ 227,436	0.075
2027	1	0	4095	Prideaux Street	(to) Gate Street-to-Victoria Street	CRK	$ 386	94.55	94.55	2	$ 454,872	$ 454,872	0.15
2027	1	0	4105	Prideaux Street	(to) Regent Street-to-King Street	CRK	$ 386	94.55	94.55	2	$ 454,872	$ 454,872	0.15
2027	1	0	11060	Norton Street	(to) Brock Street-to-Jordan Street	CRK	$ 332	94.55	94.55	2	$ 391,190	$ 391,190	0.129
2027	1	0	11180	Macdonell Road	(to) Norton Street-to-Kirby Street	CRK	$ 332	94.55	94.55	2	$ 391,190	$ 391,190	0.129
2027	1	0	25663	Nelson Street	(to) Ricardo Street-to-End	CRK	$ 157	94.55	94.55	2	$ 184,981	$ 184,981	0.061
2027	1	0	880	Concession 6 Road	(to) Line 7 Road-to-Line 6 Road	CRK	$ 2,149	92.95	92.95	2	$ 1,425,003	$ 1,425,003	0.836
2027	1	0	55	East and West Line	(to) Niagara Street-to-Concession 1 Road	CRK	$ 1,704	82.4	82.4	2	$ 861,984	$ 861,984	0.663
2027	1	0	35	East and West Line	(to) Concession 4 Road-to-Regional Road 55 - Niagara Stone Road	CRK	$ 987	79.56	79.56	2	$ 465,046	$ 465,046	0.384
2027	1	0	700	Concession 2 Road	(to) Line 7 Road-to-Line 6 Road	CRK	$ 2,167	73.76	73.76	2	$ 911,903	$ 911,903	0.843
2027	1	0	25	East and West Line	(to) Regional Road 100 - Four Mile Creek Road-to-0.4km East of 100- Four M	CRK	$ 1,028	90.01	90.01	2	$ 722,696	$ 722,696	0.4
2027	1	0	30	East and West Line	(to) 0.4km East of 100- Four Mile Creek Road-to-Concession 4 Road	CRK	$ 1,640	90.01	90.01	2	$ 1,152,700	$ 1,152,700	0.638
2027	1	0	4155	Queen Street	(to) Mississagua Street-to-Simcoe Street	CRK	$ 590	82.4	82.4	2	$ 284,600	$ 284,600	0.153
2027	1	0	690	Concession 2 Road	(to) Arnold Road-to-Line 8 Road	CRK	$ 403	82.4	82.4	2	$ 189,726	$ 189,726	0.157
2027	1	0	680	Concession 2 Road	(to) 0.3km North of 81- York Road-to-Line 9 Road	CRK	$ 1,555	81.54	81.54	2	$ 996,764	$ 996,764	0.605
2027	1	0	785	Concession 4 Road	(to) Line 2 Road-to-Line 3 Road	CRK	$ 2,120	92.95	92.95	2	$ 1,124,613	$ 1,124,613	0.825
2027	1	0	705	Concession 2 Road	(to) Line 6 Road-to-Line 5 Road	CRK	$ 2,146	92.95	92.95	2	$ 1,138,245	$ 1,138,245	0.835
2027	1	0	870	Concession 6 Road	(to) Queenston Road-to-Line 8 Road	CRK	$ 2,149	92.95	92.95	2	$ 1,139,609	$ 1,139,609	0.836
2027	1	0	585	Queenston Road	(to) Semi-Urban Section (St. David's)-to-Regional Road 81- York Road	CRK	$ 776	79.56	79.56	2	$ 268,019	$ 268,019	0.302
2027	1	0	4480	John Street West	(to) Gate Street-to-Victoria Street	CRK	$ 383	82.4	82.4	2	$ 129,372	$ 129,372	0.149
2027	1	0	975	Townline Road	(to) 81- York Road-to-Queenston Road	CRK	$ 2,053	83.76	83.76	2	$ 907,073	$ 907,073	0.799
2027	1	0	4030	Delater Street	(to) Turntable Road-to-Melville Street	CRK	$ 262	92.95	92.95	2	$ 100,739	$ 100,739	0.102
2027	1	0	4475	John Street West	(to) Simcoe Street-to-Gate Street	CRK	$ 370	92.95	92.95	2	$ 138,677	$ 138,677	0.144
2027	1	0	4805	King Street	(to) Cottage Street-to-Paffard Street	CRK	$ 758	79.27	79.27	2	$ 240,219	$ 240,219	0.295
2027	1	0	5125	Butler Street	(to) Centre Street-to-Gage Street	CRK	$ 380	79.27	79.27	2	$ 117,411	$ 117,411	0.148
2027	1	0	1110	Niven Road	(to) 87- Lakeshore Road-to-350m South of 87 Lakeshore Road	CRK	$ 900	94.55	94.55	2	$ 456,419	$ 456,419	0.35
2027	1	0	4210	Johnson Street	(to) Palatine Place-to-Newark Street	CRK	$ 378	94.55	94.55	2	$ 157,493	$ 157,493	0.147
2027	1	0	4025	Delater Street	(to) Ball Street-to-Turntable Road	CRK	$ 154	94.55	94.55	2	$ 60,278	$ 60,278	0.06
2027	1	0	5040	Simcoe Street	(to) Mary Street-to-William Street	CRK	$ 411	94.55	94.55	2	$ 158,072	$ 158,072	0.16
2027	1	0	4525	Anne Street	(to) Simcoe Street-to-Gate Street	CRK	$ 380	94.55	94.55	2	$ 144,982	$ 144,982	0.148
2027	1	0	4515	Anne Street	(to) 55- Mississauga Street-to-Start of Culdesac	SST	$ 2,406	77.26	90		$ 62,629	$ 72,957	0.081
2027	1	0	335	Line 5 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 5 Road	DSTrehab	$ 258,004	38.42	95		$ 624,440	$ 1,544,035	1.188
2027	1	0	95	Line 1 Road	(to) Concession 7 Road-to-0.2km West of Concession 6 Road	DSTrehab	$ 170,500	46.08	95		$ 555,702	$ 1,145,653	0.804
2027	1	0	495	Line 8 Road	(to) Concession 1 Road-to-Niagara River Parkway	DSTrehab	$ 185,595	43.36	95		$ 538,632	$ 1,180,121	0.908
2027	1	0	955	Concession 7 Road	(to) Line 5 Road-to-Regional Road 55 - Niagara Stone Road	PR2	$ 226,524	38.42	100		$ 492,423	$ 1,281,685	0.842
2027	1	0	4550	Weatherstone Court	(to) Charlotte Street-to-East End Cul de sac	R2	**$ 103,068**	39.27	100		$ 225,450	$ 574,102	0.179

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2027	1	0	4645	The Promenade	(to) Coach Drive (South)-to-Coach Drive (North)	R2	$ 312,869	39.27	100		$ 673,831	$ 1,715,893	0.535
2027	1	0	340	Line 5 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	DSTrehab	$ 198,677	26.61	95		$ 260,530	$ 930,115	0.972
2027	1	0	4605	Melville Street	(to) Byron Street-to-Ricardo Street	SD	$ 2,444	91.48	91.48	2	$ 437,168	$ 437,168	0.149
2027	1	0	370	Line 6 Road	(to) Concession 6 Road-to-Concession 5 Road	DSTrehab	$ 204,063	46.08	95		$ 614,028	$ 1,265,901	0.974
2027	1	0	1045	Coon Road	(to) Regional Road 81- York Road-to-Queenston Road	PR2	$ 52,713	15	100		$ 30,816	$ 205,442	0.185
2027	1	0	540	Queenston Road	(to) 0.4km East of 55- Niagara Stone Road-to-Coon Road	PR2	$ 98,830	43.36	100		$ 238,463	$ 549,960	0.375
2027	1	0	27369	Lampman Court	(to) 89- Glendale Avenue-to-East End Cul de sac	PR2	$ 102,329	20	100		$ 83,785	$ 418,923	0.366
2027	1	0	4070	Ricardo Street	(to) Melville Street-to-0.12km East of Melville Street	R2	$ 68,556	43.8	100		$ 168,574	$ 384,873	0.12
2027	1	0	5435	Lower Canada Drive	(to) Garrison Village Drive-to-Confederation Drive (West)	R2	$ 69,127	43.91	100		$ 170,406	$ 388,080	0.121
2027	1	0	5450	Confederation Drive	(to) Navy Hall Circle-to-Lower Canada Drive	R2	$ 301,646	43.91	100		$ 743,590	$ 1,693,442	0.528
2027	1	0	70	Church Road	(to) 86- Stewart Road-to-McNab Road	SD	$ 15,219	73.27	73.27	2	$ 930,232	$ 930,232	0.928
2027	1	0	930	Concession 7 Road	(to) 81- York Road-to-Queenston Road	PR2	$ 230,554	46.08	100		$ 604,388	$ 1,311,605	0.868
2027	1	0	4655	Coach Drive	(to) The Promenade (South)-to-Settlers Court	R2	$ 100,001	43.91	100		$ 240,822	$ 548,444	0.171
2027	1	0	4660	Coach Drive	(to) Settlers Court-to-The Promenade (North)	R2	$ 75,440	43.91	100		$ 181,673	$ 413,739	0.129
2027	1	0	4665	Settlers Court	(to) Coach Drive-to-South End Cul De Sac	R2	$ 105,264	43.91	100		$ 253,497	$ 577,310	0.18
2027	1	0	140	Line 1 Road	(to) Concession 4 Road-to-Concession 3 Road	DSTrehab	$ 283,789	52	95		$ 1,018,438	$ 1,860,607	1.068
2027	1	0	4080	Ricardo Street	(to) Nelson Street-to-Collingwood Street	R2	$ 110,097	39.37	100		$ 215,753	$ 548,014	0.161
2027	1	0	830	Concession 5 Road	(to) 0.2km North of Queenston Road-to-Line 8 Road	DSTrehab	$ 144,102	30.51	95		$ 206,434	$ 642,781	0.705
2027	1	0	1050	McNab Road	(to) 83- Carleton Street-to-Scott Street	SD	$ 17,991	75.11	75.11	2	$ 777,723	$ 777,723	1.097
2027	1	0	1145	Warner Road	(to) West End Cul De Sac-to-Concession 5 Road	SD	$ 4,658	75.11	75.11	2	$ 201,343	$ 201,343	0.284
2027	1	0	4285	Gage Street	(to) Dorchester Street-to-0.1km West of Dorchester Street	SD	$ 1,492	89.84	89.84	2	$ 82,540	$ 82,540	0.091
							$ 3,524,365						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2028	1	0	4595	Niagara Street	(to) 0.13km South of Charlotte Street-to-East and West Line	CRK	$ 815	76.67	76.67	2	$ 487,854	$ 487,854	0.317
2028	1	0	65	Church Road	(to) Read Road-to-86- Stewart Road	SST	$ 27,383	77.27	90		$ 974,673	$ 1,135,247	0.922
2028	1	0	80	Church Road	(to) Irvine Road-to-Townline Road	SST	$ 27,749	77.27	90		$ 971,502	$ 1,131,554	0.919
2028	1	0	150	Line 1 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 35,843	77.27	90		$ 1,177,642	$ 1,371,655	1.114
2028	1	0	1030	Irvine Road	(to) Scott Street-to-Church Road	SST	$ 34,753	77.27	90		$ 826,952	$ 963,190	1.097
2028	1	0	675	Concession 2 Road	(to) 81- York Road-to-0.3km North of 81- York Road	R1	$ 41,013	70.83	95.83		$ 457,255	$ 618,647	0.3
2028	1	0	3080	Henry Street	(to) Line 1 Road-to-Pine Street	R2	$ 87,409	46.17	100		$ 226,562	$ 490,713	0.153
2028	1	0	4565	James Street	(to) Charlotte Street-to-West End	R2	$ 125,114	46.33	100		$ 325,419	$ 702,393	0.219
2028	1	0	5440	Lower Canada Drive	(to) Confederation Drive (West)-to-Confederation Drive (East)	R2	$ 128,542	46.33	100		$ 334,334	$ 721,637	0.225
2028	1	0	5545	Navy Hall Circle	(to) Confederation Drive-to-East End Cul de sac	R2	$ 103,405	46.33	100		$ 268,954	$ 580,517	0.181
2028	1	0	3035	Frontier Drive	(to) Cherry Street-to-Hearth Court	R2	$ 89,825	46.33	100		$ 231,805	$ 500,335	0.156
2028	1	0	4640	The Promenade	(to) Charlotte Street-to-Coach Drive (South)	R2	$ 54,387	46.33	100		$ 138,192	$ 298,277	0.093
2028	1	0	4650	The Promenade	(to) Coach Drive (North)-to-Charlotte Street	R2	$ 112,867	46.33	100		$ 286,785	$ 619,004	0.193
2028	1	0	1070	Read Road	(to) 83- Carleton Street-to-Seaway Haulage Road	PR2	$ 126,331	29.36	100		$ 157,173	$ 535,329	0.49
2028	1	0	685	Concession 2 Road	(to) Line 9 Road-to-Arnold Road	R1	$ 89,112	51.19	76.19		$ 504,492	$ 750,875	0.672
2028	1	0	715	Concession 2 Road	(to) Larkin Road-to-Line 4 Road	R1	$ 59,153	59.31	84.31		$ 380,110	$ 540,332	0.437
2028	1	0	350	Line 5 Road	(to) Concession 2 Road-to-Concession 1 Road	DSTrehab	$ 199,060	40.8	95		$ 428,623	$ 998,020	1.113
2028	1	0	710	Concession 2 Road	(to) Line 5 Road-to-Larkin Road	R1	$ 57,460	51.19	76.19		$ 315,307	$ 469,296	0.42
2028	1	0	1005	Townline Road	(to) Scott Street-to-Line 2 Road	DSTrehab	$ 62,776	58.37	95		$ 269,650	$ 438,869	0.315
2028	1	0	270	Line 3 Road	(to) Concession 4 Road-to-Concession 3 Road	R2	$ 273,090	48.96	100		$ 727,685	$ 1,486,284	1.069
2028	1	0	275	Line 3 Road	(to) Concession 3 Road-to-Concession 2 Road	R2	$ 265,937	48.96	100		$ 708,625	$ 1,447,354	1.041
2028	1	0	10010	Apricot Glen Drive	(to) Tanbark Road-to-Bunny Glen Drive	R2	$ 66,842	51.35	100		$ 192,691	$ 375,251	0.117
2028	1	0	10020	Bunny Glen Drive	(to) Apricot Glen Drive-to-Red Haven Drive	R2	$ 55,416	51.35	100		$ 159,753	$ 311,106	0.097
2028	1	0	10030	Bunny Glen Drive	(to) Red Haven Drive-to-Creekside Drive	R2	$ 119,401	51.35	100		$ 344,210	$ 670,321	0.209
2028	1	0	4075	Ricardo Street	(to) 0.12km East of Melville Street-to-Nelson Street	R2	$ 63,596	46.17	100		$ 146,153	$ 316,555	0.093
2028	1	0	4085	Ricardo Street	(to) Collingwood Street-to-0.12km East of Collingwood Street	R2	$ 80,008	46.17	100		$ 183,870	$ 398,246	0.117
2028	1	0	4510	John Street East	(to) Charlotte Street-to-Niagara River Parkway	R1	$ 171,955	51.19	76.19		$ 882,066	$ 1,312,846	1.132
2028	1	0	365	Line 6 Road	(to) Concession 7 Road-to-Concession 6 Road	DSTrehab	$ 181,390	43.36	95		$ 399,519	$ 875,329	0.922
2028	1	0	4870	Regent Street	(to) John Street West-to-Mary Street	SD	$ 2,509	85.56	85.56	2	$ 139,094	$ 139,094	0.153
2028	1	0	405	Eastchester Avenue	(to) Stewart Road-to-0.06km West of 55- Niagara Stone Road	GRR2	$ 73,361	65.7	85.7		$ 538,897	$ 702,945	0.869
2028	1	0	575	Queenston Road	(to) Concession 6 Road-to-Concession 5 Road	R1	$ 163,011	56.5	81.5		$ 893,181	$ 1,288,394	1.031
2028	1	0	11020	Garrison Village Drive	(to) Jordan Street-to-Regional Road 55 - Niagara Stone Road	R2	$ 99,592	53.83	100		$ 291,775	$ 542,030	0.169
2028	1	0	4840	King Street	(to) Gage Street-to-Johnson Street	CRKsd	$ 2,186	73.76	73.76	2	$ 147,119	$ 147,119	0.147
2028	1	0	670	Concession 1 Road	(to) Line 1 Road-to-East and West Line	DSTrehab	$ 183,960	58.37	95		$ 718,703	$ 1,169,724	0.9
2028	1	0	5115	Butler Street	(to) Mary Street-to-William Street	SD	$ 2,558	85.56	85.56	2	$ 137,111	$ 137,111	0.156
2028	1	0	525	Line 9 Road	(to) Concession 3 Road-to-Concession 2 Road	DSTrehab	$ 217,890	40.8	95		$ 410,523	$ 955,876	1.066
2028	1	0	1055	McNab Road	(to) Scott Street-to-Church Road	SD	$ 17,236	77.27	77.27	2	$ 856,992	$ 856,992	1.051
2028	1	0	4290	Gage Street	(to) Dorchester Street-to-Butler Street	SD	$ 2,526	85.56	85.56	2	$ 131,865	$ 131,865	0.154
2028	1	0	4295	Gage Street	(to) Butler Street-to-Mississagua Street	SD	$ 2,542	85.56	85.56	2	$ 132,722	$ 132,722	0.155
2028	1	0	4300	Gage Street	(to) Mississagua Street-to-Simcoe Street	SD	$ 2,509	85.56	85.56	2	$ 131,009	$ 131,009	0.153
2028	1	0	4570	Flynn Street	(to) Rye Street-to-Green Street	SD	$ 4,362	85.56	85.56	2	$ 227,767	$ 227,767	0.266
2028	1	0	4575	Flynn Street	(to) Green Street-to-Charlotte Street	SD	$ 2,345	85.56	85.56	2	$ 122,447	$ 122,447	0.143
2028	1	0	5130	Butler Street	(to) Johnson Street-to-South End	SD	$ 869	85.56	85.56	2	$ 45,382	$ 45,382	0.053
2028	1	0	4425	William Street	(to) Victoria Street-to-Regent Street	SD	$ 2,444	65.65	65.65	2	$ 97,895	$ 97,895	0.149
2028	1	0	4045	Front Street	(to) Victoria Street-to-Regent Street	SD	$ 2,427	70.84	70.84	2	$ 121,577	$ 121,577	0.148
2028	1	0	4065	Ricardo Street	(to) Wellington Street-to-Melville Street	SD	$ 1,640	70.84	70.84	2	$ 71,520	$ 71,520	0.1
							$ 3,524,599						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2029	1	0	20	East and West Line	(to) 0.5km East of Concession Road 6-to-Regional Road 100 - Four Mile Cre	CRK	$ 1,172	92.95	92.95	2	$ 850,783	$ 850,783	0.456
2029	1	0	1075	Read Road	(to) Carlton Street-to-Scott Street	CRK	$ 702	92.95	92.95	2	$ 465,342	$ 465,342	0.273
2029	1	0	4510	John Street East	(to) Charlotte Street-to-Niagara River Parkway	CRK	$ 2,909	76.19	76.19	2	$ 1,312,846	$ 1,312,846	1.132
2029	1	0	685	Concession 2 Road	(to) Line 9 Road-to-Arnold Road	CRK	$ 1,727	76.19	76.19	2	$ 750,875	$ 750,875	0.672
2029	1	0	710	Concession 2 Road	(to) Line 5 Road-to-Larkin Road	CRK	$ 1,079	76.19	76.19	2	$ 469,296	$ 469,296	0.42
2029	1	0	575	Queenston Road	(to) Concession 6 Road-to-Concession 5 Road	CRK	$ 2,650	81.5	81.5	2	$ 1,288,394	$ 1,288,394	1.031
2029	1	0	105	Line 1 Road	(to) Concession 6 Road-to-Homestead Drive	SST	$ 17,478	65.65	90		$ 515,093	$ 706,144	0.527
2029	1	0	715	Concession 2 Road	(to) Larkin Road-to-Line 4 Road	CRK	$ 1,123	84.31	84.31	2	$ 540,332	$ 540,332	0.437
2029	1	0	630	Concession 1 Road	(to) Line 7 Road-to-Line 6 Road (East)	SST	$ 17,588	73.27	90		$ 565,356	$ 694,446	0.564
2029	1	0	380	Line 6 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST	$ 26,480	73.27	90		$ 824,979	$ 1,013,350	0.823
2029	1	0	1035	Irvine Road	(to) Church Road-to-Lakeshore Road	SST	$ 35,904	73.27	90		$ 1,110,602	$ 1,364,190	1.099
2029	1	0	782	Tanbark Road	(to) 200m N of Stoneridge Crescent-to-Line 9 Road	SST	$ 11,524	77.27	90		$ 313,744	$ 365,432	0.388
2029	1	0	980	Townline Road	(to) Queenston Road-to-0.15 North of Queenston Road	SST	$ 4,529	77.27	90		$ 122,311	$ 142,461	0.15
2029	1	0	925	Wagg Road	(to) East and West Line-to-North End Cul De Sac	SST	$ 27,682	77.27	90		$ 668,911	$ 779,112	0.902
2029	1	0	435	Line 7 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST	$ 20,925	77.27	90		$ 501,713	$ 584,368	0.671
2029	1	0	965	Concession 7 Road	(to) Line 3 Road-to-Line 2 Road	SST	$ 26,258	77.27	90		$ 629,570	$ 733,290	0.842
2029	1	0	970	Concession 7 Road	(to) Line 2 Road-to-Line 1 Road	SST	$ 26,601	77.27	90		$ 637,795	$ 742,870	0.853
2029	1	0	220	Line 2 Road	(to) Concession 4 Road-to-Concession 3 Road	R2	$ 262,995	55.19	100		$ 862,815	$ 1,563,353	1.066
2029	1	0	950	Concession 7 Road	(to) Line 6 Road-to-Line 5 Road	R2	$ 226,151	55.19	100		$ 707,362	$ 1,281,685	0.842
2029	1	0	3060	Harvest Drive	(to) Homestead Drive-to-0.1 km West of Homestead	R2	$ 57,580	53.91	100		$ 172,904	$ 320,728	0.1
2029	1	0	5155	Dorchester Street	(to) Centre Street-to-Gage Street	R2	$ 31,314	46.33	100		$ 68,622	$ 148,115	0.148
2029	1	0	4845	King Street	(to) Johnson Street-to-Queen Street	R2	$ 150,367	43.8	100		$ 287,040	$ 655,342	0.154
2029	1	0	4505	John Street East	(to) Park Court-to-Charlotte Street	R2	$ 37,864	35.37	100		$ 50,459	$ 142,661	0.131
2029	1	0	570	Queenston Road	(to) Concession 7 Road-to-Concession 6 Road	R1	$ 136,923	53.91	78.91		$ 669,877	$ 980,523	0.866
2029	1	0	580	Queenston Road	(to) Concession 5 Road-to-Semi-Urban Section (St. David's)	R1	$ 148,782	53.91	78.91		$ 727,892	$ 1,065,442	0.941
2029	1	0	10200	Four Mile Creek Road	(to) East and West Line-to-Hunter Road	SD	$ 16,728	90.48	90.48	2	$ 1,415,093	$ 1,415,093	1.02
2029	1	0	10210	Four Mile Creek Road	(to) Hunter Road-to-Wall Road	SD	$ 12,677	90.48	90.48	2	$ 1,072,419	$ 1,072,419	0.773
2029	1	0	560	Queenston Road	(to) Townline Road-to-0.5km East of Townline Road	SD	$ 8,200	90.48	90.48	2	$ 693,673	$ 693,673	0.5
2029	1	0	10220	Four Mile Creek Road	(to) Wall Road-to-Lakeshore Road	SD	$ 9,742	90.48	90.48	2	$ 818,104	$ 818,104	0.594
2029	1	0	295	Line 4 Road	(to) 0.1km East of Concession 7 Road-to-Concession 6 Road	GRR2	$ 83,538	61.55	81.55		$ 513,571	$ 680,451	0.884
2029	1	0	455	Lincoln Avenue	(to) Regional Road 90- Airport Road-to-East End	DSTrehab	$ 201,666	40.8	95		$ 346,243	$ 806,203	0.877
2029	1	0	4435	Mary Street	(to) Mississagua Street-to-Simcoe Street	R2	$ 51,613	43.8	100		$ 91,522	$ 208,954	0.154
2029	1	0	4440	Mary Street	(to) Simcoe Street-to-Gate Street	R2	$ 47,927	43.8	100		$ 84,985	$ 194,029	0.143
2029	1	0	4445	Mary Street	(to) Gate Street-to-Victoria Street	R2	$ 50,273	43.8	100		$ 89,145	$ 203,527	0.15
2029	1	0	4455	Mary Street	(to) Regent Street-to-King Street	R2	$ 50,273	43.8	100		$ 89,145	$ 203,527	0.15
2029	1	0	5190	Nassau Street	(to) Johnson Street-to-Queen Street	R1	$ 18,350	55.19	80.19		$ 83,954	$ 121,984	0.152
2029	1	0	462	Line 8 Road	(to) Concession 7 Road-to-0.3km East of Concession 7 Road	DSTrehab	$ 66,686	46.08	95		$ 138,150	$ 284,815	0.3
2029	1	0	5110	Butler Street	(to) John Street West-to-Mary Street	R1	$ 19,000	48.82	73.82		$ 78,173	$ 118,204	0.16
2029	1	0	4415	William Street	(to) Simcoe Street-to-Gate Street	R1	$ 17,401	59.1	84.1		$ 85,762	$ 122,040	0.145
2029	1	0	430	Line 7 Road	(to) Concession 5 Road-to-Regional Road 100 - Four Mile Creek Road	SD	$ 24,223	73.27	73.27	2	$ 1,047,196	$ 1,047,196	1.477
2029	1	0	5195	Newark Street	(to) Johnson Street-to-Raiana Drive	R1	$ 19,561	55.19	80.19		$ 83,954	$ 121,984	0.152
2029	1	0	170	Scott Street	(to) McNab Road-to-Irvine Road	SD	$ 15,055	65.65	65.65	2	$ 592,724	$ 592,724	0.918
2029	1	0	390	Line 6 Road	(to) Concession 2 Road-to-Concession 1 Road	SD	$ 17,974	65.65	65.65	2	$ 707,654	$ 707,654	1.096
2029	1	0	400	Eastchester Avenue	(to) House 165 Entrance-to-Regional Road 88 - Stewart Road	R1	$ 10,532	48.82	73.82		$ 40,232	$ 60,834	0.078
2029	1	0	4305	Gage Street	(to) Simcoe Street-to-Gate Street	R1	$ 19,292	53.91	78.91		$ 80,928	$ 118,457	0.15
2029	1	0	605	Mallette Crescent	(to) Melrose Drive-to-End	R1	$ 115,485	69.47	94.47		$ 624,233	$ 848,874	0.255
2029	1	0	4500	John Street East	(to) Park Court-to-Park Court	R2	$ 28,133	43.8	100		$ 44,837	$ 102,368	0.094
2029	1	0	4920	Victoria Street	(to) John Street West-to-Mary Street	R1	$ 19,913	46.08	71.08		$ 70,557	$ 108,837	0.153
2029	1	0	985	Townline Road	(to) 0.15 North of Queenston Road-to-Martin Road	GRR2	$ 14,459	61.55	81.55		$ 78,430	$ 103,915	0.135
2029	1	0	4530	Anne Street	(to) Gate Street-to-Victoria Street	R1	$ 20,278	69.47	94.47		$ 106,525	$ 144,859	0.148

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2029	1	0	5045	Simcoe Street	(to) William Street-to-Centre Street	R1	$ 21,048	59.1	84.1		$ 93,866	$ 133,572	0.152
2029	1	0	915	Concession 6 Road	(to) Line 2 Road-to-Line 1 Road	R1	$ 113,436	40.81	65.81		$ 352,146	$ 567,869	0.84
2029	1	0	4050	Front Street	(to) Regent Street-to-King Street	SD	$ 2,460	70.84	70.84	2	$ 123,220	$ 123,220	0.15
2029	1	0	4520	Anne Street	(to) 55- Mississauga Street-to-Simcoe Street	R1	$ 21,003	59.1	84.1		$ 92,790	$ 132,041	0.149
2029	1	0	4535	Anne Street	(to) Victoria Street-to-88m East of Victoria St.	R1	$ 12,238	59.1	84.1		$ 53,884	$ 76,678	0.088
2029	1	0	4495	John Street East	(to) King Street-to-Park Court	R2	$ 43,108	43.8	100		$ 65,347	$ 149,195	0.137
2029	1	0	3090	Henry Street	(to) Cherry Street-to-Andres Street	R1	$ 116,578	59.1	84.1		$ 502,307	$ 714,789	0.265
2029	1	0	3100	Cherry Street	(to) Frontier Drive-to-Andres Street	R1	$ 42,672	53.91	78.91		$ 167,717	$ 245,494	0.097
2029	1	0	4460	John Street West	(to) Dorchester Street-to-Butler Street	R1	$ 64,668	59.1	84.1		$ 278,639	$ 396,506	0.147
2029	1	0	4545	Christopher Street	(to) Charlotte Street-to-East End Cul de sac	R1	$ 50,151	59.1	84.1		$ 216,087	$ 307,494	0.114
2029	1	0	4960	Karsam Court	(to) Simcoe Street-to-North End Cul De Sac	R1	$ 74,786	53.91	78.91		$ 293,937	$ 430,247	0.17
2029	1	0	5180	Nassau Street	(to) 0.1km North of William Street-to-Hampton Court	R1	$ 45,312	59.1	84.1		$ 195,236	$ 277,824	0.103
2029	1	0	5185	Nassau Street	(to) Hampton Court-to-Johnson Street	R1	$ 106,900	59.1	84.1		$ 460,606	$ 655,448	0.243
2029	1	0	3085	Henry Street	(to) Pine Street-to-Cherry Street	R1	$ 139,014	48.82	73.82		$ 494,790	$ 748,165	0.316
2029	1	0	3210	Bianca Drive	(to) Loretta Drive-to-Loretta Drive	MICRO	$ 7,994	67.92	67.92	3	$ 372,503	$ 372,503	0.171
2029	1	0	4755	Rye Street	(to) Niagara Street-to-Cottage Street	R1	$ 94,874	56.54	81.54		$ 386,253	$ 557,041	0.213
2029	1	0	5075	Anderson Lane	(to) 55- Mississauga Street-to-Simcoe Street	R1	$ 113,939	48.64	73.64		$ 404,045	$ 611,716	0.259
2029	1	0	5430	Sentry Circle	(to) Garrison Village Drive-to-West End Cul De Sac	R1	$ 52,677	59.1	84.1		$ 225,565	$ 320,981	0.119
2029	1	0	5445	Confederation Drive	(to) Lower Canada Drive-to-Navy Hall Circle	R1	$ 51,030	48.82	73.82		$ 181,632	$ 274,643	0.116
2029	1	0	5470	Upper Canada Drive	(to) Confederation Drive-to-Colonel Butler Crescent	R1	$ 38,512	59.1	84.1		$ 164,909	$ 234,667	0.087
2029	1	0	5455	Confederation Drive	(to) Lower Canada Drive-to-Upper Canada Drive	R1	$ 42,496	48.82	73.82		$ 150,316	$ 227,291	0.096
2029	1	0	4820	King Street	(to) John Street-to-Mary Street	R1	$ 22,477	56.54	81.54		$ 87,908	$ 126,778	0.154
2029	1	0	26309	Counsell Street	(to) Regional Road 81- York Road-to-North End Cul De Sac	SD	$ 2,936	74.49	74.49	2	$ 161,678	$ 161,678	0.179
2029	1	0	5140	Dorchester Street	(to) John Street West-to-Mary Street	CRKsd	$ 2,409	74.49	74.49	2	$ 131,416	$ 131,416	0.162
2029	1	0	4060	Ricardo Street	(to) Ball Street-to-Wellington Street	SD	$ 1,050	67.92	67.92	2	$ 43,503	$ 43,503	0.064
2029	1	0	4915	Victoria Street	(to) Anne Street-to-John Street West	CRKsd	$ 2,216	74.49	74.49	2	$ 114,994	$ 114,994	0.149
2029	1	0	5215	Orchard Drive	(to) Lansdowne Avenue-to-Lakeview Street	CRKsd	$ 1,294	69.47	69.47	2	$ 60,486	$ 60,486	0.087
							$ 3,524,564						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	5075	Anderson Lane	(to) 55- Mississauga Street-to-Simcoe Street	CRK	$ 666	73.64	73.64	2	$ 611,716	$ 611,716	0.259
2030	1	0	10170	Four Mile Creek Road	(to) Niagara Stone Road-to-Field Road	CRK	$ 786	92.95	92.95	2	$ 930,869	$ 930,869	0.306
2030	1	0	910	Concession 6 Road	(to) 55- Mississauga Street-to-Cross Culvert	CRK	$ 992	92.95	92.95	2	$ 1,174,234	$ 1,174,234	0.386
2030	1	0	775	Tanbark Road	(to) Regional Road 81- York Road-to-Stoneridge Crescent	CRK	$ 619	92.95	92.95	2	$ 721,395	$ 721,395	0.241
2030	1	0	4810	King Street	(to) Paffard Street-to-Anne Street	CRK	$ 378	92.95	92.95	2	$ 438,231	$ 438,231	0.147
2030	1	0	4490	John Street West	(to) Regent Street-to-King Street	CRK	$ 386	92.95	92.95	2	$ 447,174	$ 447,174	0.15
2030	1	0	4815	King Street	(to) Anne Street-to-John Street	CRK	$ 386	92.95	92.95	2	$ 447,174	$ 447,174	0.15
2030	1	0	3100	Cherry Street	(to) Frontier Drive-to-Andres Street	CRK	$ 249	78.91	78.91	2	$ 245,494	$ 245,494	0.097
2030	1	0	4960	Karsam Court	(to) Simcoe Street-to-North End Cul De Sac	CRK	$ 437	78.91	78.91	2	$ 430,247	$ 430,247	0.17
2030	1	0	4755	Rye Street	(to) Niagara Street-to-Cottage Street	CRK	$ 547	81.54	81.54	2	$ 557,041	$ 557,041	0.213
2030	1	0	4605	Melville Street	(to) Byron Street-to-Ricardo Street	CRK	$ 383	89.73	89.73	2	$ 428,805	$ 428,805	0.149
2030	1	0	3085	Henry Street	(to) Pine Street-to-Cherry Street	CRK	$ 812	73.82	73.82	2	$ 748,165	$ 748,165	0.316
2030	1	0	5445	Confederation Drive	(to) Lower Canada Drive-to-Navy Hall Circle	CRK	$ 298	73.82	73.82	2	$ 274,643	$ 274,643	0.116
2030	1	0	5455	Confederation Drive	(to) Lower Canada Drive-to-Upper Canada Drive	CRK	$ 247	73.82	73.82	2	$ 227,291	$ 227,291	0.096
2030	1	0	260	Line 3 Road	(to) Concession 6 Road-to-Regional Road 100 - Four Mile Creek Road	CRK	$ 3,963	92.95	92.95	2	$ 3,162,259	$ 3,162,259	1.542
2030	1	0	265	Line 3 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 4 Road	CRK	$ 1,257	92.95	92.95	2	$ 912,354	$ 912,354	0.489
2030	1	0	4200	Queen's Parade	(to) 0.40km East of Wellington Street-to-John Street	CRK	$ 2,552	92.95	92.95	2	$ 1,852,692	$ 1,852,692	0.993
2030	1	0	735	Concession 2 Road	(to) Line 1 Road-to-East and West Line	CRK	$ 2,352	92.95	92.95	2	$ 1,707,164	$ 1,707,164	0.915
2030	1	0	605	Mallette Crescent	(to) Melrose Drive-to-End	CRK	$ 655	94.47	94.47	2	$ 848,874	$ 848,874	0.255
2030	1	0	10	East and West Line	(to) Townline Road-to-Concession 6 Road	CRK	$ 5,209	92.95	92.95	2	$ 3,656,884	$ 3,656,884	2.027
2030	1	0	730	Concession 2 Road	(to) Line 2 Road-to-Line 1 Road	CRK	$ 2,143	92.95	92.95	2	$ 1,504,609	$ 1,504,609	0.834
2030	1	0	15	East and West Line	(to) Concession 6 Road-to-0.5km East of Concession Road 6	CRK	$ 1,285	92.95	92.95	2	$ 902,044	$ 902,044	0.5
2030	1	0	725	Concession 2 Road	(to) Line 3 Road-to-Line 2 Road	CRK	$ 2,131	92.95	92.95	2	$ 1,495,588	$ 1,495,588	0.829
2030	1	0	865	Concession 6 Road	(to) Regional Road 81- York Road-to-Queenston Road	CRK	$ 2,177	92.95	92.95	2	$ 1,528,062	$ 1,528,062	0.847
2030	1	0	2105	Queenston Street	(to) Dumfries Street-to-Partition Street	CRK	$ 236	97	97	2	$ 314,462	$ 314,462	0.092
2030	1	0	2110	Queenston Street	(to) Partition Street-to-Kent Street	CRK	$ 226	97	97	2	$ 300,790	$ 300,790	0.088
2030	1	0	2115	Queenston Street	(to) Kent Street-to-Clarence Street	CRK	$ 226	97	97	2	$ 300,790	$ 300,790	0.088
2030	1	0	29771	Kenmir Avenue	(to) Hickory Avenue-to-Kenmir Avenue	CRK	$ 786	97	97	2	$ 1,045,930	$ 1,045,930	0.306
2030	1	0	30311	Kenmir Avenue	(to) Highland Lane-to-Tanbark Road	CRK	$ 604	97	97	2	$ 803,246	$ 803,246	0.235
2030	1	0	28967	Hickory Avenue	(to) West End-to-Kenmir Avenue	CRK	$ 486	97	97	2	$ 646,015	$ 646,015	0.189
2030	1	0	2100	Queenston Street	(to) Highlander Street-to-Dumfries Street	CRK	$ 229	97	97	2	$ 304,208	$ 304,208	0.089
2030	1	0	29096	Perez Road	(to) Rampart Street-to-Garrison Village Drive	CRK	$ 308	97	97	2	$ 397,729	$ 397,729	0.12
2030	1	0	29097	Perez Road	(to) Rampart Street-to-Niven Road	CRK	$ 244	97	97	2	$ 314,869	$ 314,869	0.095
2030	1	0	555	Queenston Road	(to) Martin Road-to-Townline Road	CRK	$ 1,724	92.95	92.95	2	$ 956,322	$ 956,322	0.671
2030	1	0	875	Concession 6 Road	(to) Line 8 Road-to-Line 7 Road	CRK	$ 2,133	92.95	92.95	2	$ 1,182,932	$ 1,182,932	0.83
2030	1	0	885	Concession 6 Road	(to) Line 6 Road-to-Line 5 Road	CRK	$ 2,141	92.95	92.95	2	$ 1,187,208	$ 1,187,208	0.833
2030	1	0	890	Concession 6 Road	(to) Line 5 Road-to-Line 4 Road	CRK	$ 2,156	92.95	92.95	2	$ 1,195,759	$ 1,195,759	0.839
2030	1	0	895	Concession 6 Road	(to) Line 4 Road-to-0.1km South of Line 3 Road	CRK	$ 1,892	92.95	92.95	2	$ 1,048,961	$ 1,048,961	0.736
2030	1	0	912	Concession 6 Road	(to) Cross Culvert-to-Line 2 Road	CRK	$ 702	92.95	92.95	2	$ 389,085	$ 389,085	0.273
2030	1	0	900	Concession 6 Road	(to) 0.1km South of Line 3 Road-to-Line 3 Road	CRK	$ 260	92.95	92.95	2	$ 143,947	$ 143,947	0.101
2030	1	0	3120	Henegan Road	(to) Regional Road 55 - Niagara Stone Road-to-Walker Road	CRK	$ 817	97	97	2	$ 997,400	$ 997,400	0.318
2030	1	0	3130	Walker Road	(to) Henegan Road-to-East End	CRK	$ 262	97	97	2	$ 319,921	$ 319,921	0.102
2030	1	0	8388	Plantation Drive	(to) 129m West of Homestead Drive-to-West End	CRK	$ 51	97	97	2	$ 62,222	$ 62,222	0.02
2030	1	0	3125	Walker Road	(to) Henegan Road-to-West End Cul De Sac	CRK	$ 702	97	97	2	$ 856,258	$ 856,258	0.273
2030	1	0	29115	Brock Street	(to) 25m North of Cooley Crescent-to-Cooley Lane	CRK	$ 64	97	97	2	$ 77,777	$ 77,777	0.025
2030	1	0	29116	Macdonell Road	(to) Brock Street-to-Cooley Lane	CRK	$ 105	97	97	2	$ 127,553	$ 127,553	0.041
2030	1	0	4720	Wellington Street	(to) Platoff Street-to-Queens Parade- Picton	CRK	$ 396	97	97	2	$ 481,060	$ 481,060	0.154
2030	1	0	2090	Queenston Street	(to) Dee Road-to-Walnut Street	CRK	$ 64	97	97	2	$ 77,777	$ 77,777	0.025
2030	1	0	24294	Annmarie Drive	(to) 0.048 km North of Raiana Drive-to-Paradise Grove	CRK	$ 123	97	97	2	$ 149,331	$ 149,331	0.048
2030	1	0	4715	Wellington Street	(to) Castlereagh Street-to-Platoff Street	CRK	$ 386	97	97	2	$ 468,565	$ 468,565	0.15

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	8337	Harvest Drive	(to) 0.1 km West of Homestead-to-West End	CRK	$ 100	97	97	2	$ 121,331	$ 121,331	0.039
2030	1	0	10085	Paxton Lane	(to) Old Mill Lane-to-Goring Way	CRK	$ 200	97	97	2	$ 242,663	$ 242,663	0.078
2030	1	0	11030	Garrison Village Drive	(to) Colonel Cohoe Street-to-Brock Street	CRK	$ 100	97	97	2	$ 121,331	$ 121,331	0.039
2030	1	0	11080	Brock Street	(to) Kirby Street-to-Murray Street	CRK	$ 141	97	97	2	$ 171,108	$ 171,108	0.055
2030	1	0	3170	Annmarie Drive	(to) Raiana Drive-to-North End	CRK	$ 100	97	97	2	$ 121,331	$ 121,331	0.039
2030	1	0	10075	David Secord Drive	(to) Old Mill Lane-to-Goring Way	CRK	$ 213	97	97	2	$ 258,218	$ 258,218	0.083
2030	1	0	10110	Goring Way	(to) Paxton Lane-to-David Secord Drive	CRK	$ 254	97	97	2	$ 307,994	$ 307,994	0.099
2030	1	0	11120	Jordan Street	(to) Garrison Village Drive-to-Blackbird Street	CRK	$ 177	97	97	2	$ 214,663	$ 214,663	0.069
2030	1	0	24335	Rampart Street	(to) Moseby Street-to-Perez Street	CRK	$ 213	97	97	2	$ 258,218	$ 258,218	0.083
2030	1	0	28877	Pierpoint Drive	(to) Copper Beach Boulevard-to-Gossen Drive	CRK	$ 290	97	97	2	$ 351,549	$ 351,549	0.113
2030	1	0	28881	Summerhayes Drive	(to) Pierpoint Drive-to-End	CRK	$ 236	97	97	2	$ 286,217	$ 286,217	0.092
2030	1	0	29112	Brock Street	(to) Macdonell Road-to-Murray Street	CRK	$ 154	97	97	2	$ 186,664	$ 186,664	0.06
2030	1	0	3030	Frontier Drive	(to) Homestead Drive-to-Cherry Street	CRK	$ 308	97	97	2	$ 373,327	$ 373,327	0.12
2030	1	0	3070	Autumn Place	(to) Grange Crescent-to-South End Cul De Sac	CRK	$ 272	97	97	2	$ 329,772	$ 329,772	0.106
2030	1	0	9088	Chestnut Avenue	(to) Hickory Avenue-to-Bend	CRK	$ 213	97	97	2	$ 258,218	$ 258,218	0.083
2030	1	0	10120	Goring Way	(to) David Secord Drive-to-Glockner Lane	CRK	$ 226	97	97	2	$ 273,773	$ 273,773	0.088

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	10140	Goring Way	(to) David Lowrey Court-to-East End Cul de sac	CRK	$ 249	97	97	2	$ 301,773	$ 301,773	0.097
2030	1	0	25775	Copper Beech Boulevard	(to) Mulberry Lane-to-Pierpoint Drive	CRK	$ 362	97	97	2	$ 438,659	$ 438,659	0.141
2030	1	0	28878	Pierpoint Drive	(to) Gossen Drive-to-Summerhayes Drive	CRK	$ 208	97	97	2	$ 251,995	$ 251,995	0.081
2030	1	0	29000	Angela Crescent	(to) Cannery Drive-to-Chiara Way	CRK	$ 285	97	97	2	$ 345,328	$ 345,328	0.111
2030	1	0	29009	Chiara Way	(to) Line 9 Road-to-Angela Crescent	CRK	$ 208	97	97	2	$ 251,995	$ 251,995	0.081
2030	1	0	29114	Macdonell Road	(to) Cooley Lane-to-Murray Street	CRK	$ 375	97	97	2	$ 454,214	$ 454,214	0.146
2030	1	0	30035	Moseby Street	(to) Rampart Street-to-Niven Road	CRK	$ 244	97	97	2	$ 295,550	$ 295,550	0.095
2030	1	0	3005	Homestead Drive	(to) Line 1 Road-to-Harvest Drive	CRK	$ 249	97	97	2	$ 301,773	$ 301,773	0.097
2030	1	0	3010	Homestead Drive	(to) Harvest Drive-to-Plantation Drive	CRK	$ 267	97	97	2	$ 323,550	$ 323,550	0.104
2030	1	0	30110	Woodbourne Court	(to) South End Cul De Sac-to-Warner Road	CRK	$ 208	97	97	2	$ 251,995	$ 251,995	0.081
2030	1	0	30193	Millpond Road	(to) Millpond Road-to-Four Mile Creek Road	CRK	$ 439	97	97	2	$ 531,991	$ 531,991	0.171
2030	1	0	4090	Prideaux Street	(to) Simcoe Street-to-Gate Street	CRK	$ 380	97	97	2	$ 460,437	$ 460,437	0.148
2030	1	0	10070	David Secord Drive	(to) Four Mile Creek Road-to-Old Mill Lane	CRK	$ 262	97	97	2	$ 317,328	$ 317,328	0.102
2030	1	0	10090	Paxton Lane	(to) Goring Way-to-Goring Way	CRK	$ 799	97	97	2	$ 967,539	$ 967,539	0.311
2030	1	0	10100	Paxton Lane	(to) Goring Way-to-North End Cul De Sac	CRK	$ 406	97	97	2	$ 491,548	$ 491,548	0.158
2030	1	0	10130	Goring Way	(to) Glockner Lane-to-Paxton Lane	CRK	$ 411	97	97	2	$ 497,769	$ 497,769	0.16
2030	1	0	11040	Brock Street	(to) Norton Street-to-Blackbird Street	CRK	$ 185	97	97	2	$ 223,996	$ 223,996	0.072
2030	1	0	11130	Blackbird Street	(to) Brock Street-to-Jordan Street	CRK	$ 293	97	97	2	$ 354,660	$ 354,660	0.114
2030	1	0	11190	Macdonell Road	(to) Kirby Street-to-Murray Street	CRK	$ 203	97	97	2	$ 245,774	$ 245,774	0.079
2030	1	0	11230	Keith Crescent	(to) Wright Crescent-to-Wright Crescent	CRK	$ 1,043	97	97	2	$ 1,263,089	$ 1,263,089	0.406
2030	1	0	11240	Durham Way	(to) Wright Crescent-to-Wright Crescent	CRK	$ 311	97	97	2	$ 376,438	$ 376,438	0.121
2030	1	0	28999	Angela Crescent	(to) Cannery Drive-to-Concession 3 Road	CRK	$ 221	97	97	2	$ 267,551	$ 267,551	0.086
2030	1	0	29001	Angela Crescent	(to) Chiara Way-to-Cannery Drive	CRK	$ 917	97	97	2	$ 1,110,648	$ 1,110,648	0.357
2030	1	0	29007	Dominion Crescent	(to) Cannery Drive-to-Cannery Drive	CRK	$ 776	97	97	2	$ 939,539	$ 939,539	0.302
2030	1	0	30052	Shaws Lane	(to) Simcoe Street-to-37m North of Albion (Private Rd)	CRK	$ 673	97	97	2	$ 815,097	$ 815,097	0.262
2030	1	0	30073	Paradise Grove	(to) Annmarie Drive-to-Paradise Grove	CRK	$ 221	97	97	2	$ 267,551	$ 267,551	0.086
2030	1	0	30074	Paradise Grove	(to) Paradise Grove-to-End	CRK	$ 149	97	97	2	$ 180,441	$ 180,441	0.058
2030	1	0	30192	Millpond Road	(to) Willow Lane-to-Mills Lane	CRK	$ 465	97	97	2	$ 563,101	$ 563,101	0.181
2030	1	0	3020	Homestead Drive	(to) Grange Crescent-to-Frontier Drive	CRK	$ 185	97	97	2	$ 223,996	$ 223,996	0.072
2030	1	0	31124	Homestead Drive	(to) Concession 6 Road-to-Oakley Drive	CRK	$ 745	97	97	2	$ 902,207	$ 902,207	0.29
2030	1	0	4115	Byron Street	(to) Wellington Street-to-Melville Street	CRK	$ 262	97	97	2	$ 317,328	$ 317,328	0.102
2030	1	0	4120	Byron Street	(to) Melville Street-to-Nelson Street	CRK	$ 550	97	97	2	$ 665,766	$ 665,766	0.214
2030	1	0	5270	Oak Drive	(to) 87- Lakeshore Road-to-Chautauqua Amphitheatre	CRK	$ 1,020	97	97	2	$ 1,235,090	$ 1,235,090	0.397
2030	1	0	9040	Haynes Court	(to) Haynes Court-to-North End	CRK	$ 550	97	97	2	$ 665,766	$ 665,766	0.214
2030	1	0	9090	Chestnut Avenue	(to) Tulip Tree Road-to-Chestnut Avenue	CRK	$ 496	97	97	2	$ 600,434	$ 600,434	0.193
2030	1	0	977	Westwood Court	(to) Townline Road-to-East End	CRK	$ 979	97	97	2	$ 1,185,313	$ 1,185,313	0.381
2030	1	0	2095	Queenston Street	(to) Walnut Street-to-Highlander Street	CRK	$ 483	97	97	2	$ 584,879	$ 584,879	0.188
2030	1	0	11050	Norton Street	(to) Jordan Street-to-Macdonell Road	CRK	$ 144	97	97	2	$ 174,219	$ 174,219	0.056
2030	1	0	11070	Murray Street	(to) Brock Street-to-Macdonell Road	CRK	$ 360	97	97	2	$ 435,548	$ 435,548	0.14
2030	1	0	28880	Gossen Drive	(to) Pierpoint Drive-to-End	CRK	$ 234	97	97	2	$ 283,106	$ 283,106	0.091
2030	1	0	28969	Kenmir Avenue	(to) Hickory Avenue-to-End	CRK	$ 36	97	97	2	$ 43,555	$ 43,555	0.014
2030	1	0	29005	Cannery Drive	(to) Dominion Crescent-to-Dominion Crescent	CRK	$ 419	97	97	2	$ 507,102	$ 507,102	0.163
2030	1	0	29006	Cannery Drive	(to) Dominion Crescent-to-Concession 3 Road	CRK	$ 653	97	97	2	$ 790,209	$ 790,209	0.254
2030	1	0	30072	Paradise Grove	(to) Annmarie Drive-to-Concession 4 Road	CRK	$ 491	97	97	2	$ 594,212	$ 594,212	0.191
2030	1	0	30295	Cottage Street	(to) Shaw's Lane-to-King Street	CRK	$ 437	97	97	2	$ 528,880	$ 528,880	0.17
2030	1	0	3065	Grange Crescent	(to) Homestead Drive-to-Autumn Place	CRK	$ 756	97	97	2	$ 914,651	$ 914,651	0.294
2030	1	0	31122	Oakley Drive	(to) Homestead Drive-to-Line 1 Road	CRK	$ 964	97	97	2	$ 1,166,647	$ 1,166,647	0.375
2030	1	0	5560	Colonel Cohoe Street	(to) Niven Road-to-Garrison Village Drive	CRK	$ 522	97	97	2	$ 631,545	$ 631,545	0.203
2030	1	0	740	Concession 3 Road	(to) 81- York Road-to-Line 9 Road	CRK	$ 2,113	97	97	2	$ 2,557,290	$ 2,557,290	0.822
2030	1	0	9080	Hickory Avenue	(to) Tanbark Road-to-Dyck Lane (P)	CRK	$ 802	97	97	2	$ 970,650	$ 970,650	0.312

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	520	Line 9 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	CRK	$ 874	97	97	2	$ 1,057,760	$ 1,057,760	0.34
2030	1	0	10080	Old Mill Lane	(to) David Secord Drive-to-Goring Way	CRK	$ 265	97	97	2	$ 320,439	$ 320,439	0.103
2030	1	0	10150	Glockner Lane	(to) Goring Way-to-West End Cul De Sac	CRK	$ 368	97	97	2	$ 444,881	$ 444,881	0.143
2030	1	0	29003	Cannery Drive	(to) Angela Crescent-to-Angela Crescent	CRK	$ 229	97	97	2	$ 276,885	$ 276,885	0.089
2030	1	0	30191	Millpond Road	(to) Line 9 Road-to-Willow Lane	CRK	$ 211	97	97	2	$ 255,107	$ 255,107	0.082
2030	1	0	11100	Brock Street	(to) Norton Street-to-Kirby Street	CRK	$ 206	97	97	2	$ 248,885	$ 248,885	0.08
2030	1	0	28876	Pierpoint Drive	(to) Copper Beach Boulevard-to-End	CRK	$ 139	97	97	2	$ 167,997	$ 167,997	0.054
2030	1	0	29004	Cannery Drive	(to) Angela Crescent-to-Dominion Crescent	CRK	$ 206	97	97	2	$ 248,885	$ 248,885	0.08
2030	1	0	30034	Rampart Street	(to) Colonel Cohoe Street-to-Moseby Street	CRK	$ 188	97	97	2	$ 227,107	$ 227,107	0.073
2030	1	0	3015	Homestead Drive	(to) Plantation Drive-to-Grange Crescent	CRK	$ 242	97	97	2	$ 292,439	$ 292,439	0.094
2030	1	0	3075	Grange Crescent	(to) Autumn Place-to-Homestead Drive	CRK	$ 224	97	97	2	$ 270,662	$ 270,662	0.087
2030	1	0	31123	Homestead Drive	(to) Oakley Drive-to-Dead End	CRK	$ 103	97	97	2	$ 124,442	$ 124,442	0.04
2030	1	0	515	Line 9 Road	(to) Regional Road 100 - Four Mile Creek Road-to-0.1km West of 100- Four	CRK	$ 260	97	97	2	$ 314,217	$ 314,217	0.101
2030	1	0	4865	Regent Street	(to) 0.05km South of John Street West-to-John Street West	CRK	$ 116	97	97	2	$ 139,997	$ 139,997	0.045
2030	1	0	3025	Homestead Drive	(to) Frontier Drive-to-West End Cul De Sac	CRK	$ 129	97	97	2	$ 155,553	$ 155,553	0.05
2030	1	0	5080	Mississagua Street	(to) 87- Mary Street-to-William Street	CRK	$ 416	92.95	92.95	2	$ 215,854	$ 215,854	0.162
2030	1	0	5085	Mississagua Street	(to) William Street-to-Centre Street	CRK	$ 380	92.95	92.95	2	$ 197,200	$ 197,200	0.148
2030	1	0	5090	Mississagua Street	(to) Centre Street-to-Gage Street	CRK	$ 380	92.95	92.95	2	$ 197,200	$ 197,200	0.148
2030	1	0	5095	Mississagua Street	(to) Gage Street-to-Johnson Street	CRK	$ 380	92.95	92.95	2	$ 197,200	$ 197,200	0.148
2030	1	0	5100	Mississagua Street	(to) Johnson Street-to-Queen Street	CRK	$ 396	92.95	92.95	2	$ 194,223	$ 194,223	0.154
2030	1	0	30088	Anne Street	(to) Anne Street-to-End	CRK	$ 159	97	97	2	$ 155,705	$ 155,705	0.062
2030	1	0	70	Church Road	(to) 86- Stewart Road-to-McNab Road	SST	$ 27,562	69.4	90		$ 881,098	$ 1,142,635	0.928
2030	1	0	580	Queenston Road	(to) Concession 5 Road-to-Semi-Urban Section (St. David's)	CRK	$ 2,418	78.91	78.91	2	$ 1,065,442	$ 1,065,442	0.941
2030	1	0	570	Queenston Road	(to) Concession 7 Road-to-Concession 6 Road	CRK	$ 2,226	78.91	78.91	2	$ 980,523	$ 980,523	0.866
2030	1	0	4130	Queen Street	(to) Palatine Place-to-Newark Street	CRK	$ 511	92.95	92.95	2	$ 204,700	$ 204,700	0.199
2030	1	0	4140	Queen Street	(to) Nassau Street-to-Dorchester Street	CRK	$ 375	92.95	92.95	2	$ 150,182	$ 150,182	0.146
2030	1	0	4150	Queen Street	(to) Butler Street-to-Mississagua Street	CRK	$ 393	92.95	92.95	2	$ 157,383	$ 157,383	0.153
2030	1	0	24118	Steele Road	(to) 0.35km West of Four Mile Creek Road-to-End	SST	$ 4,054	77.27	90		$ 199,110	$ 231,913	0.273
2030	1	0	4135	Queen Street	(to) Newark Street-to-Nassau Street	CRK	$ 383	92.95	92.95	2	$ 153,268	$ 153,268	0.149
2030	1	0	4145	Queen Street	(to) Dorchester Street-to-Butler Street	CRK	$ 401	92.95	92.95	2	$ 160,469	$ 160,469	0.156
2030	1	0	1060	McNab Road	(to) Church Road-to-87- Lakeshore Road	SST	$ 32,255	77.27	90		$ 1,489,270	$ 1,734,623	1.051
2030	1	0	4470	John Street West	(to) 55- Mississauga Street-to-Simcoe Street	CRK	$ 388	92.95	92.95	2	$ 145,417	$ 145,417	0.151
2030	1	0	660	Concession 1 Road	(to) Line 3 Road-to-Line 2 Road	SST	$ 26,071	77.27	90		$ 1,184,615	$ 1,379,777	0.836
2030	1	0	665	Concession 1 Road	(to) Line 2 Road-to-Line 1 Road	SST	$ 26,133	77.27	90		$ 1,187,449	$ 1,383,078	0.838
2030	1	0	850	Concession 6 Road	(to) Niagara Falls Boundary-to-Warner Road	CRK	$ 938	97	97	2	$ 689,884	$ 689,884	0.365
2030	1	0	915	Concession 6 Road	(to) Line 2 Road-to-Line 1 Road	SST	$ 26,195	65.81	90		$ 567,869	$ 776,602	0.84
2030	1	0	165	Scott Street	(to) Stewart Road-to-McNab Road	SST	$ 27,131	77.27	90		$ 998,987	$ 1,163,567	0.945
2030	1	0	185	Line 2 Road	(to) Concession 7 Road-to-Concession 6 Road	SST	$ 30,499	77.27	90		$ 1,108,281	$ 1,290,866	0.978
2030	1	0	655	Concession 1 Road	(to) Line 4 Road-to-Line 3 Road	SST	$ 25,884	77.27	90		$ 940,565	$ 1,095,521	0.83
2030	1	0	85	Line 1 Road	(to) Townline Road-to-0.2km East of Townline Road	SST	$ 6,268	77.27	90		$ 227,776	$ 265,301	0.201
2030	1	0	4820	King Street	(to) John Street-to-Mary Street	CRK	$ 396	81.54	81.54	2	$ 126,778	$ 126,778	0.154
2030	1	0	4305	Gage Street	(to) Simcoe Street-to-Gate Street	CRK	$ 386	78.91	78.91	2	$ 118,457	$ 118,457	0.15
2030	1	0	330	Line 5 Road	(to) Concession 6 Road-to-Concession 5 Road	SST	$ 28,809	77.27	90		$ 1,025,415	$ 1,194,350	0.97
2030	1	0	480	Line 8 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST	$ 14,820	77.27	90		$ 527,508	$ 614,413	0.499
2030	1	0	485	Line 8 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 31,601	77.27	90		$ 1,124,785	$ 1,310,090	1.064
2030	1	0	530	Line 9 Road	(to) Concession 1 Road-to-Concession 2 Road	SST	$ 31,571	77.27	90		$ 1,123,728	$ 1,308,859	1.063
2030	1	0	1000	Townline Road	(to) Line 3 Road-to-Scott Street	SST	$ 16,731	77.27	90		$ 589,270	$ 686,350	0.52
2030	1	0	225	Line 2 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 33,687	77.27	90		$ 1,186,472	$ 1,381,940	1.047
2030	1	0	995	Townline Road	(to) 83- Carleton Street-to-Line 3 Road	SST	$ 19,048	77.27	90		$ 670,861	$ 781,384	0.592
2030	1	0	375	Line 6 Road	(to) Concession 5 Road-to-Regional Road 100 - Four Mile Creek Road	SST	$ 40,371	77.27	90		$ 1,413,381	$ 1,646,231	1.337

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	400	Eastchester Avenue	(to) House 165 Entrance-to-Regional Road 88 - Stewart Road	CRK	$ 200	73.82	73.82	2	$ 60,834	$ 60,834	0.078
2030	1	0	75	Church Road	(to) McNab Road-to-Irvine Road	SST	$ 29,033	77.27	90		$ 1,000,044	$ 1,164,798	0.946
2030	1	0	180	Line 2 Road	(to) Townline Road-to-Concession 7 Road	SST	$ 32,620	77.27	90		$ 1,105,757	$ 1,287,927	1.046
2030	1	0	230	Line 2 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 34,771	77.27	90		$ 1,178,699	$ 1,372,886	1.115
2030	1	0	490	Line 8 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 33,399	77.27	90		$ 1,132,185	$ 1,318,709	1.071
2030	1	0	620	Concession 1 Road	(to) Arnold Road-to-Line 8 Road (West)	SST	$ 5,146	77.27	90		$ 174,426	$ 203,162	0.165
2030	1	0	625	Concession 1 Road	(to) Line 8 Road (West)-to-Line 7 Road	SST	$ 26,008	77.27	90		$ 881,645	$ 1,026,894	0.834
2030	1	0	640	Concession 1 Road	(to) Line 6 Road (West)-to-Line 5 Road	SST	$ 26,102	77.27	90		$ 884,817	$ 1,030,588	0.837
2030	1	0	650	Concession 1 Road	(to) Larkin Road-to-Line 4 Road	SST	$ 13,347	77.27	90		$ 452,451	$ 526,991	0.428
2030	1	0	815	Concession 4 Road	(to) East and West Line-to-Hunter Road	SST	$ 24,355	77.27	90		$ 825,618	$ 961,636	0.781
2030	1	0	810	Concession 4 Road	(to) Regional Road 55 - Niagara Stone Road-to-East and West Line	SST	$ 13,912	77.27	90		$ 462,766	$ 539,006	0.385
2030	1	0	155	Line 1 Road	(to) Concession 1 Road-to-Niagara River Parkway	SST	$ 34,041	77.27	90		$ 1,118,442	$ 1,302,702	1.058
2030	1	0	385	Line 6 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 33,430	77.27	90		$ 1,098,357	$ 1,279,308	1.039
2030	1	0	5110	Butler Street	(to) John Street West-to-Mary Street	CRK	$ 411	73.82	73.82	2	$ 118,204	$ 118,204	0.16
2030	1	0	280	Line 3 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 36,946	77.27	90		$ 1,196,796	$ 1,393,965	1.114
2030	1	0	4920	Victoria Street	(to) John Street West-to-Mary Street	SST	$ 4,544	71.08	90		$ 108,837	$ 137,807	0.153
2030	1	0	4530	Anne Street	(to) Gate Street-to-Victoria Street	CRK	$ 380	94.47	94.47	2	$ 144,859	$ 144,859	0.148
2030	1	0	4780	Davy Street	(to) Castlereagh Street-to-Platoff Street	SST	$ 4,522	77.26	90		$ 115,080	$ 134,056	0.145
2030	1	0	4540	Anne Street	(to) 88m East of Victoria St.-to-King Street	CRK	$ 540	97	97	2	$ 252,388	$ 252,388	0.21
2030	1	0	345	Line 5 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 30,413	77.27	90		$ 746,846	$ 869,887	1.024
2030	1	0	475	Line 8 Road	(to) Tanbark Road-to-Regional Road 100 - Four Mile Creek Road	SST	$ 16,721	77.27	90		$ 410,620	$ 478,268	0.563
2030	1	0	845	Concession 5 Road	(to) Line 6 Road-to-Line 5 Road	SST	$ 25,364	77.27	90		$ 622,858	$ 725,472	0.854
2030	1	0	ORAB	Line 4 Road	(to) Niagara River Parkway-to-Concession 1 Road	SST	$ 31,541	77.27	90		$ 774,561	$ 902,168	1.062
2030	1	0	4965	Gate Street	(to) Anne Street-to-John Street East	CRK	$ 378	97	97	2	$ 169,122	$ 169,122	0.147
2030	1	0	835	Concession 5 Road	(to) Line 8 Road-to-Line 7 Road	SST	$ 25,688	77.27	90		$ 620,708	$ 722,967	0.837
2030	1	0	425	Line 7 Road	(to) Concession 6 Road-to-Concession 5 Road	SST	$ 30,936	77.27	90		$ 741,727	$ 863,924	0.992
2030	1	0	440	Line 7 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 32,744	77.27	90		$ 785,094	$ 914,436	1.05
2030	1	0	445	Line 7 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 33,836	77.27	90		$ 811,264	$ 944,917	1.085
2030	1	0	960	Concession 7 Road	(to) Regional Road 55 - Niagara Stone Road-to-Line 3 Road	SST	$ 23,545	77.27	90		$ 564,520	$ 657,523	0.755
2030	1	0	1160	Warner Road	(to) Tanbark Road-to-Regional Road 100 - Four Mile Creek Road	CRK	$ 1,180	97	97	2	$ 520,220	$ 520,220	0.459
2030	1	0	310	Line 4 Road	(to) 0.1km East of 100- Four Mile Creek Road-to-Concession 3 Road	SST	$ 30,856	77.27	90		$ 728,794	$ 848,861	0.959
2030	1	0	315	Line 4 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 33,494	77.27	90		$ 791,110	$ 921,443	1.041
2030	1	0	320	Larkin Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 35,811	77.27	90		$ 845,828	$ 985,175	1.113
2030	1	0	463	Line 8 Road	(to) Concession 6 Road-to-0.55km East of Concession 6 Road	CRK	$ 1,414	97	97	2	$ 611,643	$ 611,643	0.55
2030	1	0	9127	Lakeshore Road	(to) Townline Road-to-Lakeshore Road	CRK	$ 144	97	97	2	$ 62,032	$ 62,032	0.056
2030	1	0	4220	Johnson Street	(to) Nassau Street-to-Dorchester Street	CRK	$ 375	97	97	2	$ 160,475	$ 160,475	0.146
2030	1	0	4215	Johnson Street	(to) Newark Street-to-Nassau Street	CRK	$ 378	97	97	2	$ 161,574	$ 161,574	0.147
2030	1	0	1175	Johanna Drive	(to) Regional Road 100 - Four Mile Creek Road-to-West End Cul De Sac	CRK	$ 229	97	97	2	$ 97,062	$ 97,062	0.089
2030	1	0	4110	Byron Street	(to) King Street-to-Wellington Street	CRK	$ 794	97	97	2	$ 318,477	$ 318,477	0.309
2030	1	0	1155	Warner Road	(to) 0.3km West of Tanbark Road-to-Tanbark Road	CRK	$ 774	97	97	2	$ 302,502	$ 302,502	0.301
2030	1	0	27449	Tulip Tree Road	(to) Turlip Tree Road-to-Hickory Avenue	CRK	$ 242	97	97	2	$ 92,860	$ 92,860	0.094
2030	1	0	4360	Centre Street	(to) Butler Street-to-Mississagua Street	CRK	$ 398	97	97	2	$ 150,467	$ 150,467	0.155
2030	1	0	4420	William Street	(to) Gate Street-to-Victoria Street	CRK	$ 380	97	97	2	$ 143,672	$ 143,672	0.148
2030	1	0	3090	Henry Street	(to) Cherry Street-to-Andres Street	CRK	$ 681	84.1	84.1	2	$ 714,789	$ 714,789	0.265
2030	1	0	4460	John Street West	(to) Dorchester Street-to-Butler Street	CRK	$ 378	84.1	84.1	2	$ 396,506	$ 396,506	0.147
2030	1	0	4545	Christopher Street	(to) Charlotte Street-to-East End Cul de sac	CRK	$ 293	84.1	84.1	2	$ 307,494	$ 307,494	0.114
2030	1	0	5180	Nassau Street	(to) 0.1km North of William Street-to-Hampton Court	CRK	$ 265	84.1	84.1	2	$ 277,824	$ 277,824	0.103
2030	1	0	5430	Sentry Circle	(to) Garrison Village Drive-to-West End Cul De Sac	CRK	$ 306	84.1	84.1	2	$ 320,981	$ 320,981	0.119
2030	1	0	5470	Upper Canada Drive	(to) Confederation Drive-to-Colonel Butler Crescent	CRK	$ 224	84.1	84.1	2	$ 234,667	$ 234,667	0.087
2030	1	0	5185	Nassau Street	(to) Hampton Court-to-Johnson Street	CRK	$ 625	84.1	84.1	2	$ 655,448	$ 655,448	0.243

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2030	1	0	695	Concession 2 Road	(to) Line 8 Road-to-Line 7 Road	R1	$ 115,997	70.83	95.83		$ 1,096,276	$ 1,483,215	0.844
2030	1	0	700	Concession 2 Road	(to) Line 7 Road-to-Line 6 Road	R1	$ 115,860	70.83	95.83		$ 875,679	$ 1,184,757	0.843
2030	1	0	3235	Loretta Drive	(to) Bianca Drive-to-Concession 4 Road	R1	$ 50,151	70.84	95.84		$ 259,012	$ 350,419	0.114
2030	1	0	5385	Village Drive, NOTL	(to) Niven Road-to-Garrison Village Drive	R1	$ 34,528	70.84	95.84		$ 177,219	$ 239,761	0.078
2030	1	0	3050	Hearth Court	(to) Frontier Drive-to-South End Cul De Sac	R1	$ 71,269	46.33	71.33		$ 239,235	$ 368,327	0.161
2030	1	0	5460	Upper Canada Drive	(to) Garrison Village Drive-to-Southgate Circle	R1	$ 125,275	46.33	71.33		$ 420,518	$ 647,433	0.283
2030	1	0	10195	Four Mile Creek Road	(to) Pleasant Lane-to-East and West Line	R1	$ 284,448	46.17	71.17		$ 914,183	$ 1,409,192	0.605
2030	1	0	4185	Picton Street	(to) Davy Street-to-Wellington Street	R1	$ 83,972	70.84	95.84		$ 405,912	$ 549,161	0.152
2030	1	0	5395	Garrison Village Drive	(to) Colonel Butler Crescent-to-Westgate Drive	R1	$ 71,883	70.84	95.84		$ 348,171	$ 471,043	0.152
2030	1	0	5400	Garrison Village Drive	(to) Westgate Drive-to-Tottenham Court	R1	$ 36,887	53.83	78.83		$ 135,766	$ 198,819	0.078
2030	1	0	5410	Garrison Village Drive	(to) Upper Canada Drive-to-Village Drive, NOTL	R1	$ 42,562	53.83	78.83		$ 156,652	$ 229,406	0.09
2030	1	0	5415	Garrison Village Drive	(to) Village Road-to-Lower Canada Drive	R1	$ 26,483	53.83	78.83		$ 97,473	$ 142,741	0.056
2030	1	0	210	Line 2 Road	(to) Hope Avenue-to-Annmarie Drive	R1	$ 48,666	70.84	95.84		$ 233,700	$ 316,175	0.1
2030	1	0	215	Line 2 Road	(to) Annmarie Drive-to-Concession 4 Road	R1	$ 95,385	70.84	95.84		$ 458,054	$ 619,704	0.196
2030	1	0	4450	Mary Street	(to) Victoria Street-to-Regent Street	RMrural	$ 80,656	26.08	100		$ 52,372	$ 200,813	0.148
2030	1	0	5405	Garrison Village Drive	(to) Tottenham Court-to-Upper Canada Drive	R1	$ 46,818	46.17	71.17		$ 147,797	$ 227,826	0.099
2030	1	0	5420	Garrison Village Drive	(to) Lower Canada Drive-to-Samuel Street	R1	$ 38,306	46.17	71.17		$ 120,925	$ 186,403	0.081
2030	1	0	920	Concession 6 Road	(to) Line 1 Road-to-East and West Line	BS	$ 484,068	20	95		$ 240,512	$ 1,142,430	0.879
2030	1	0	4180	Picton Street	(to) King Street-to-Davy Street	R1	$ 82,782	70.84	95.84		$ 387,740	$ 524,576	0.156
2030	1	0	4995	Gate Street	(to) Johnson Street-to-Queen Street	R1	$ 78,842	46.33	71.33		$ 244,433	$ 376,331	0.155
2030	1	0	1110A	Niven Road	(to) 350m South of 87 Lakeshore Road-to-670m South of 87- Lakeshore Roa	BS	$ 176,225	21.92	95		$ 95,964	$ 415,901	0.32
2030	1	0	9000	Young Crescent	(to) Niagara-on-the-Green Blvd.-to-Niagara-on-the-Green Blvd.	MICRO	$ 19,214	61.71	61.71	3	$ 813,455	$ 813,455	0.411
2030	1	0	1210	Robertson Road	(to) Niagara-on-the-Green Blvd.-to-Cole Crescent	MICRO	$ 10,238	66.91	66.91	3	$ 469,971	$ 469,971	0.219
2030	1	0	5065	Simcoe Street	(to) Queen Street-to-Prideaux Street	MICRO	$ 7,246	66.91	66.91	3	$ 332,628	$ 332,628	0.155
2030	1	0	9010	Wright Crescent	(to) Young Crescent-to-Griffiths Gate	MICRO	$ 15,755	66.91	66.91	3	$ 723,198	$ 723,198	0.337
2030	1	0	565	Queenston Road	(to) 0.5km East of Townline Road-to-Concession 7 Road	SD	$ 8,954	61.71	61.71	2	$ 369,903	$ 369,903	0.546
2030	1	0	4395	William Street	(to) Nassau Street-to-Dorchester Street	MICRO	$ 6,966	72	72	3	$ 344,076	$ 344,076	0.149
2030	1	0	4930	Victoria Street	(to) William Street-to-Centre Street	CRKsd	$ 2,305	66.91	66.91	2	$ 103,791	$ 103,791	0.155
2030	1	0	5070	Simcoe Street	(to) Prideaux Street-to-Front Street	MICRO	$ 6,732	72	72	3	$ 332,531	$ 332,531	0.144
2030	1	0	4485	John Street West	(to) Victoria Street-to-Regent Street	SD	$ 2,444	87.88	87.88	2	$ 137,976	$ 137,976	0.149
2030	1	0	5205	Palatine Place	(to) Orchard Drive-to-Johnson Street	CRKsd	$ 1,071	79.27	79.27	2	$ 57,119	$ 57,119	0.072
							$ 3,524,918						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2031	1	0	5400	Garrison Village Drive	(to) Westgate Drive-to-Tottenham Court	CRK	$ 200	78.83	78.83	2	$ 198,819	$ 198,819	0.078
2031	1	0	5410	Garrison Village Drive	(to) Upper Canada Drive-to-Village Drive, NOTL	CRK	$ 231	78.83	78.83	2	$ 229,406	$ 229,406	0.09
2031	1	0	5415	Garrison Village Drive	(to) Village Road-to-Lower Canada Drive	CRK	$ 144	78.83	78.83	2	$ 142,741	$ 142,741	0.056
2031	1	0	4995	Gate Street	(to) Johnson Street-to-Queen Street	CRK	$ 398	71.33	71.33	2	$ 376,331	$ 376,331	0.155
2031	1	0	5460	Upper Canada Drive	(to) Garrison Village Drive-to-Southgate Circle	CRK	$ 727	71.33	71.33	2	$ 647,433	$ 647,433	0.283
2031	1	0	3050	Hearth Court	(to) Frontier Drive-to-South End Cul De Sac	CRK	$ 414	71.33	71.33	2	$ 368,327	$ 368,327	0.161
2031	1	0	675	Concession 2 Road	(to) 81- York Road-to-0.3km North of 81- York Road	CRK	$ 771	92.95	92.95	2	$ 600,055	$ 600,055	0.3
2031	1	0	45	East and West Line	(to) Concession 3 Road-to-Concession 2 Road	CRK	$ 2,693	92.95	92.95	2	$ 1,955,309	$ 1,955,309	1.048
2031	1	0	4195	Queen's Parade	(to) 0.15km East of Wellington Street-to-0.40km East of Wellington Street	CRK	$ 643	92.95	92.95	2	$ 466,438	$ 466,438	0.25
2031	1	0	1085	Read Road	(to) Church Road-to-87- Lakeshore Road	CRK	$ 2,986	92.95	92.95	2	$ 2,123,998	$ 2,123,998	1.162
2031	1	0	5	East and West Line	(to) 87- Lakeshore Road-to-Townline Road	CRK	$ 650	92.95	92.95	2	$ 456,434	$ 456,434	0.253
2031	1	0	40	East and West Line	(to) Regional Road 55 - Niagara Stone Road-to-Concession 3 Road	CRK	$ 1,778	92.95	92.95	2	$ 1,222,221	$ 1,222,221	0.692
2031	1	0	1080	Read Road	(to) Scott Street-to-Church Road	CRK	$ 2,727	92.95	92.95	2	$ 1,821,612	$ 1,821,612	1.061
2031	1	0	935	Concession 7 Road	(to) Queenston Road-to-Line 8 Road	CRK	$ 2,082	92.95	92.95	2	$ 1,137,674	$ 1,137,674	0.81
2031	1	0	940	Concession 7 Road	(to) Line 8 Road-to-Line 7 Road	CRK	$ 2,169	92.95	92.95	2	$ 1,185,428	$ 1,185,428	0.844
2031	1	0	945	Concession 7 Road	(to) Line 7 Road-to-Line 6 Road	CRK	$ 2,172	92.95	92.95	2	$ 1,169,355	$ 1,169,355	0.845
2031	1	0	3140	Elden Street	(to) Penner Street-to-North End Cul De Sac	CRK	$ 439	97	97	2	$ 531,991	$ 531,991	0.171
2031	1	0	355	Browns Point Circle	(to) Niagara River Parkway-to-West End Cul De Sac	CRK	$ 568	97	97	2	$ 687,544	$ 687,544	0.221
2031	1	0	545	Queenston Road	(to) Coon Road-to-Regional Road 90- Airport Road	CRK	$ 2,218	92.95	92.95	2	$ 1,176,414	$ 1,176,414	0.863
2031	1	0	4425	William Street	(to) Victoria Street-to-Regent Street	SST	$ 3,688	62.02	90		$ 92,482	$ 134,204	0.149
2031	1	0	5190	Nassau Street	(to) Johnson Street-to-Queen Street	CRK	$ 391	79.27	79.27	2	$ 120,585	$ 120,585	0.152
2031	1	0	5195	Newark Street	(to) Johnson Street-to-Raiana Drive	CRK	$ 391	79.27	79.27	2	$ 120,585	$ 120,585	0.152
2031	1	0	4520	Anne Street	(to) 55- Mississauga Street-to-Simcoe Street	CRK	$ 383	83.76	83.76	2	$ 131,507	$ 131,507	0.149
2031	1	0	5045	Simcoe Street	(to) William Street-to-Centre Street	CRK	$ 391	83.76	83.76	2	$ 133,032	$ 133,032	0.152
2031	1	0	4535	Anne Street	(to) Victoria Street-to-88m East of Victoria St.	CRK	$ 226	83.76	83.76	2	$ 76,368	$ 76,368	0.088
2031	1	0	4415	William Street	(to) Simcoe Street-to-Gate Street	CRK	$ 373	83.76	83.76	2	$ 121,547	$ 121,547	0.145
2031	1	0	90	Line 1 Road	(to) 0.2km East of Townline Road-to-Concession 7 Road	SST	$ 24,918	77.27	90		$ 886,931	$ 1,033,051	0.839
2031	1	0	1055	McNab Road	(to) Scott Street-to-Church Road	SST	$ 31,735	73.27	90		$ 812,628	$ 998,178	1.051
2031	1	0	285	Line 3 Road	(to) Concession 1 Road-to-Niagara River Parkway	SST	$ 26,499	77.27	90		$ 858,385	$ 999,801	0.799
2031	1	0	805	Concession 4 Road	(to) Line 1 Road-to-Regional Road 55 - Niagara Stone Road	CRK	$ 1,326	97	97	2	$ 734,043	$ 734,043	0.516
2031	1	0	855	Concession 6 Road	(to) Warner Road-to-Highway 405 Overpass	SST	$ 13,437	77.27	90		$ 362,856	$ 422,636	0.445
2031	1	0	860	Concession 6 Road	(to) Highway 405 Overpass-to-81- York Road	SST	$ 13,739	77.27	90		$ 334,636	$ 389,767	0.455
2031	1	0	235	Line 2 Road	(to) Concession 1 Road-to-Niagara River Parkway	SST	$ 31,725	77.27	90		$ 749,313	$ 872,761	0.986
2031	1	0	250	Line 3 Road	(to) 0.1km West of 55- Niagara Stone Road-to-Regional Road 55 - Niagara S	CRK	$ 257	97	97	2	$ 108,591	$ 108,591	0.1
2031	1	0	10195	Four Mile Creek Road	(to) Pleasant Lane-to-East and West Line	CRK	$ 1,555	71.17	71.17	2	$ 1,409,192	$ 1,409,192	0.605
2031	1	0	5405	Garrison Village Drive	(to) Tottenham Court-to-Upper Canada Drive	CRK	$ 254	71.17	71.17	2	$ 227,826	$ 227,826	0.099
2031	1	0	5420	Garrison Village Drive	(to) Lower Canada Drive-to-Samuel Street	CRK	$ 208	71.17	71.17	2	$ 186,403	$ 186,403	0.081
2031	1	0	720	Concession 2 Road	(to) Line 4 Road-to-Line 3 Road	R1	$ 113,527	70.83	95.83		$ 1,070,297	$ 1,448,067	0.824
2031	1	0	300	Line 4 Road	(to) 1.0km West of 100- Four Mile Creek Road-to-Regional Road 100 - Four	GRR2	$ 88,452	65.7	85.7		$ 742,543	$ 968,584	1.08
2031	1	0	1145	Warner Road	(to) West End Cul De Sac-to-Concession 5 Road	GRR2	$ 23,260	65.7	85.7		$ 176,118	$ 229,731	0.284
2031	1	0	470	Line 8 Road	(to) Tanbark Road-to-0.2km West of Tanbark Road	GRR2	$ 16,380	65.7	85.7		$ 124,027	$ 161,783	0.2
2031	1	0	840	Concession 5 Road	(to) Line 7 Road-to-0.4km North of Line 7 Road	GRR2	$ 32,760	65.7	85.7		$ 248,054	$ 323,565	0.4
2031	1	0	1050	McNab Road	(to) 83- Carleton Street-to-Scott Street	GRR2	$ 99,520	65.7	85.7		$ 680,287	$ 887,376	1.097
2031	1	0	4840	King Street	(to) Gage Street-to-Johnson Street	R1	$ 23,312	70.84	95.84		$ 141,295	$ 191,159	0.147
2031	1	0	5220	Orchard Drive	(to) Lakeview Street-to-Palatine Place	R1	$ 13,286	69.47	94.47		$ 77,172	$ 104,944	0.111
2031	1	0	245	Line 3 Road	(to) Concession 7 Road-to-0.1km West of 55- Niagara Stone Road	GRR2	$ 70,963	65.7	85.7		$ 436,575	$ 569,474	0.704
2031	1	0	325	Line 5 Road	(to) Concession 7 Road-to-Concession 6 Road	GRR2	$ 94,752	65.7	85.7		$ 582,927	$ 760,378	0.94
2031	1	0	4065	Ricardo Street	(to) Wellington Street-to-Melville Street	R1	$ 13,571	67.92	92.92		$ 68,572	$ 93,812	0.1
2031	1	0	4255	Johnson Street	(to) Regent Street-to-King Street	R1	$ 65,988	70.84	95.84		$ 347,766	$ 470,496	0.15
2031	1	0	4020	Delater Street	(to) King Street-to-Ball Street	R1	$ 35,036	69.47	94.47		$ 181,585	$ 246,931	0.246

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2031	1	0	4040	Front Street	(to) Gate Street-to-Victoria Street	R1	$ 65,138	69.47	94.47		$ 331,986	$ 451,457	0.149
2031	1	0	3105	Cherry Street	(to) Andres Street-to-Henry Street	R1	$ 46,191	69.47	94.47		$ 233,950	$ 318,141	0.105
2031	1	0	3115	Andres Street	(to) Henry Street-to-Line 2 Road	R1	$ 88,423	69.47	94.47		$ 447,847	$ 609,012	0.201
2031	1	0	3180	Raiana Drive	(to) Hope Avenue-to-South End Cul De Sac	R1	$ 85,784	69.47	94.47		$ 434,479	$ 590,833	0.195
2031	1	0	4245	Johnson Street	(to) Gate Street-to-Victoria Street	R1	$ 65,108	69.47	94.47		$ 329,758	$ 448,427	0.148
2031	1	0	4625	Harmony Drive	(to) Charlotte Street-to-Lucia Court	R1	$ 121,857	69.47	94.47		$ 617,182	$ 839,286	0.277
2031	1	0	4900	Regent Street	(to) Queen Street-to-Prideaux Street	R1	$ 66,867	69.47	94.47		$ 338,670	$ 460,547	0.152
2031	1	0	5025	Simcoe Street	(to) Anderson Lane-to-Anne Street	R1	$ 102,941	69.47	94.47		$ 521,374	$ 709,000	0.234
2031	1	0	3040	Frontier Drive	(to) Hearth Court-to-Bordeaux Drive	R1	$ 50,021	69.47	94.47		$ 251,775	$ 342,380	0.113
2031	1	0	5490	Loyalist Court	(to) Colonel Butler Crescent-to-West End Cul De Sac	R1	$ 66,843	69.47	94.47		$ 336,443	$ 457,517	0.151
2031	1	0	5495	Colonel Butler Crescent	(to) Garrison Village Drive-to-Northgate Circle	R1	$ 47,808	69.47	94.47		$ 240,634	$ 327,231	0.108
2031	1	0	5510	Colonel Butler Crescent	(to) Upper Canada Drive-to-McFarland Gate	R1	$ 32,315	69.47	94.47		$ 162,651	$ 221,184	0.073
2031	1	0	10190	Four Mile Creek Road	(to) Penner Street-to-Pleasant Lane	R1	$ 133,996	70.84	95.84		$ 660,757	$ 893,943	0.285
2031	1	0	4045	Front Street	(to) Victoria Street-to-Regent Street	R1	$ 25,883	67.92	92.92		$ 116,566	$ 159,471	0.148
2031	1	0	4620	Melville Street	(to) Lockhart Street-to-Riverbeach Drive	R1	$ 32,045	69.47	94.47		$ 148,971	$ 202,581	0.063
2031	1	0	100	Line 1 Road	(to) 0.2km West of Concession 6 Road-to-Concession 6 Road	BS	$ 120,506	22.85	95		$ 68,890	$ 286,414	0.201
2031	1	0	615	Concession 1 Road	(to) Line 9 Road-to-Arnold Road	BS	$ 371,725	22.85	95		$ 211,012	$ 877,293	0.675
2031	1	0	3195	Diana Drive	(to) Annmarie Drive-to-North End Cul De Sac	MICRO	$ 7,761	69.47	69.47	3	$ 369,864	$ 369,864	0.166
2031	1	0	3205	Bianca Drive	(to) Diana Drive-to-Loretta Drive	MICRO	$ 8,368	69.47	69.47	3	$ 398,829	$ 398,829	0.179
2031	1	0	3215	Loretta Drive	(to) Bianca Drive-to-Fisher Drive	MICRO	$ 13,371	69.47	69.47	3	$ 637,235	$ 637,235	0.286
2031	1	0	4400	William Street	(to) Dorchester Street-to-Butler Street	MICRO	$ 7,246	69.47	69.47	3	$ 345,355	$ 345,355	0.155
2031	1	0	9050	Wright Crescent	(to) Haynes Court-to-Niagara-on-the-Green Boulevard	MICRO	$ 25,666	69.47	69.47	3	$ 1,223,224	$ 1,223,224	0.549
2031	1	0	1100	Hunter Road	(to) Concession 4 Road-to-Regional Road 55 - Niagara Stone Road	BS	$ 634,410	25.67	95		$ 404,572	$ 1,497,246	1.152
2031	1	0	410	Eastchester Avenue	(to) 0.06km West of 55- Niagara Stone Road-to-Regional Road 55 - Niagara	BS	$ 36,147	5	95		$ 3,520	$ 66,887	0.06
2031	1	0	4190	Queen's Parade	(to) Wellington Street-to-150m East of Wellington Ave	R1	$ 88,671	43.8	68.8		$ 249,455	$ 391,839	0.15
2031	1	0	4850	King Street	(to) Queen Street-to-Byron Street	R1	$ 93,810	51.19	76.19		$ 305,584	$ 454,825	0.153
2031	1	0	4855	King Street	(to) Byron Street-to-Ricardo Street	R1	$ 91,970	46.17	71.17		$ 270,212	$ 416,526	0.15
2031	1	0	4785	Davy Street	(to) Platoff Street-to-Queens Parade- Picton	MICRO	$ 7,321	69.47	69.47	3	$ 340,898	$ 340,898	0.153
2031	1	0	5145	Dorchester Street	(to) Mary Street-to-William Street	CRKsd	$ 2,349	69.47	69.47	2	$ 109,848	$ 109,848	0.158
2031	1	0	4925	Victoria Street	(to) Mary Street-to-William Street	CRKsd	$ 2,320	69.47	69.47	2	$ 108,458	$ 108,458	0.156
2031	1	0	2020	Highlander Street	(to) Niagara River Parkway-to-Queenston Street	SD	$ 3,395	83.76	83.76	2	$ 216,514	$ 216,514	0.207
2031	1	0	2030	Dumfries Street	(to) Niagara River Parkway-to-Queenston Street	SD	$ 3,411	83.76	83.76	2	$ 217,560	$ 217,560	0.208
2031	1	0	4260	Platoff Street	(to) King Street-to-Davy Street	CRKsd	$ 2,349	76.92	76.92	2	$ 123,773	$ 123,773	0.158
2031	1	0	4055	Ricardo Street	(to) King Street-to-Ball Street	SD	$ 4,018	56.54	56.54	2	$ 138,631	$ 138,631	0.245
2031	1	0	1090	Read Road	(to) 87- Lakeshore Road-to-Northrup Crescent	SD	$ 8,938	69.47	69.47	2	$ 396,610	$ 396,610	0.545
2031	1	0	4980	Gate Street	(to) William Street-to-Centre Street	SD	$ 2,509	59.1	59.1	2	$ 90,493	$ 90,493	0.153
2031	1	0	5175	Nassau Street	(to) William Street-to-0.1km North of William Street	SD	$ 1,656	64.32	64.32	2	$ 65,014	$ 65,014	0.101
2031	1	0	1185	Niagara-on-the-Green Boulevard	(to) Stevens Drive-to-Robertson Road	MICRO	$ 4,054	62.14	62.14	3	$ 140,947	$ 140,947	0.063
2031	1	0	5170	Nassau Street	(to) 87- Lakeshore Road-to-William Street	SD	$ 3,772	69.47	69.47	2	$ 159,905	$ 159,905	0.23
2031	1	0	1190	Niagara-on-the-Green Boulevard	(to) Robertson Road-to-Cole Crescent	MICRO	$ 4,183	62.14	62.14	3	$ 141,188	$ 141,188	0.065
2031	1	0	550	Queenston Road	(to) Regional Road 90- Airport Road-to-Martin Road	SD	$ 3,083	93.09	93.09	2	$ 268,345	$ 268,345	0.188
2031	1	0	305	Line 4 Road	(to) Regional Road 100 - Four Mile Creek Road-to-0.1km East of 100- Four M	BS	$ 48,610	22.85	95		$ 22,698	$ 94,367	0.101
2031	1	0	5200	Palatine Place	(to) 0.02km South of Landsdowne Avenue-to-Orchard Drive	SD	$ 2,903	76.92	76.92	2	$ 136,255	$ 136,255	0.177
2031	1	0	5320	Chautauqua Amphitheatre	(to) William Street-to-William Street	SD	$ 6,478	76.92	76.92	2	$ 304,071	$ 304,071	0.395
2031	1	0	1195	Niagara-on-the-Green Boulevard	(to) Cole Crescent-to-South End Cul De Sac	MICRO	$ 6,049	64.32	64.32	3	$ 211,343	$ 211,343	0.094
2031	1	0	5050	Simcoe Street	(to) Centre Street-to-Gage Street	SD	$ 2,394	83.76	83.76	2	$ 126,701	$ 126,701	0.146
2031	1	0	4800	King Street	(to) Cottage Street-to-South End	SD	$ 2,657	83.76	83.76	2	$ 136,995	$ 136,995	0.162
2031	1	0	4280	Lakeview Street	(to) Niagara Boulevard-to-Orchard Drive	SD	$ 1,525	83.76	83.76	2	$ 77,958	$ 77,958	0.093
2031	1	0	4310	Gage Street	(to) Gate Street-to-Victoria Street	SD	$ 2,394	83.76	83.76	2	$ 122,385	$ 122,385	0.146
2031	1	0	5315	Froebel Avenue	(to) Chautauqua Amphitheatre-to-North End	SD	$ 968	83.76	83.76	2	$ 49,457	$ 49,457	0.059

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
							$ 3,524,520						

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2032	1	0	4850	King Street	(to) Queen Street-to-Byron Street	CRK	$ 393	76.19	76.19	2	$ 454,825	$ 454,825	0.153
2032	1	0	4080	Ricardo Street	(to) Nelson Street-to-Collingwood Street	CRK	$ 414	92.95	92.95	2	$ 509,379	$ 509,379	0.161
2032	1	0	4070	Ricardo Street	(to) Melville Street-to-0.12km East of Melville Street	CRK	$ 308	92.95	92.95	2	$ 357,739	$ 357,739	0.12
2032	1	0	4620	Melville Street	(to) Lockhart Street-to-Riverbeach Drive	CRK	$ 162	94.47	94.47	2	$ 202,581	$ 202,581	0.063
2032	1	0	3040	Frontier Drive	(to) Hearth Court-to-Bordeaux Drive	CRK	$ 290	94.47	94.47	2	$ 342,380	$ 342,380	0.113
2032	1	0	4245	Johnson Street	(to) Gate Street-to-Victoria Street	CRK	$ 380	94.47	94.47	2	$ 448,427	$ 448,427	0.148
2032	1	0	3180	Raiana Drive	(to) Hope Avenue-to-South End Cul De Sac	CRK	$ 501	94.47	94.47	2	$ 590,833	$ 590,833	0.195
2032	1	0	5025	Simcoe Street	(to) Anderson Lane-to-Anne Street	CRK	$ 601	94.47	94.47	2	$ 709,000	$ 709,000	0.234
2032	1	0	5490	Loyalist Court	(to) Colonel Butler Crescent-to-West End Cul De Sac	CRK	$ 388	94.47	94.47	2	$ 457,517	$ 457,517	0.151
2032	1	0	4040	Front Street	(to) Gate Street-to-Victoria Street	CRK	$ 383	94.47	94.47	2	$ 451,457	$ 451,457	0.149
2032	1	0	4625	Harmony Drive	(to) Charlotte Street-to-Lucia Court	CRK	$ 712	94.47	94.47	2	$ 839,286	$ 839,286	0.277
2032	1	0	3105	Cherry Street	(to) Andres Street-to-Henry Street	CRK	$ 270	94.47	94.47	2	$ 318,141	$ 318,141	0.105
2032	1	0	3115	Andres Street	(to) Henry Street-to-Line 2 Road	CRK	$ 517	94.47	94.47	2	$ 609,012	$ 609,012	0.201
2032	1	0	4900	Regent Street	(to) Queen Street-to-Prideaux Street	CRK	$ 391	94.47	94.47	2	$ 460,547	$ 460,547	0.152
2032	1	0	780	Tanbark Road	(to) Stoneridge Crescent-to-200m N of Stoneridge Crescent	SST	$ 6,237	77.27	90		$ 495,652	$ 577,310	0.2
2032	1	0	5495	Colonel Butler Crescent	(to) Garrison Village Drive-to-Northgate Circle	CRK	$ 278	94.47	94.47	2	$ 327,231	$ 327,231	0.108
2032	1	0	5510	Colonel Butler Crescent	(to) Upper Canada Drive-to-McFarland Gate	CRK	$ 188	94.47	94.47	2	$ 221,184	$ 221,184	0.073
2032	1	0	10200	Four Mile Creek Road	(to) East and West Line-to-Hunter Road	CRK	$ 2,621	87.88	87.88	2	$ 1,374,429	$ 1,374,429	1.02
2032	1	0	10210	Four Mile Creek Road	(to) Hunter Road-to-Wall Road	CRK	$ 1,987	87.88	87.88	2	$ 1,041,602	$ 1,041,602	0.773
2032	1	0	560	Queenston Road	(to) Townline Road-to-0.5km East of Townline Road	CRK	$ 1,285	87.88	87.88	2	$ 673,740	$ 673,740	0.5
2032	1	0	10220	Four Mile Creek Road	(to) Wall Road-to-Lakeshore Road	CRK	$ 1,527	87.88	87.88	2	$ 794,595	$ 794,595	0.594
2032	1	0	955	Concession 7 Road	(to) Line 5 Road-to-Regional Road 55 - Niagara Stone Road	CRK	$ 2,164	92.95	92.95	2	$ 1,191,326	$ 1,191,326	0.842
2032	1	0	4655	Coach Drive	(to) The Promenade (South)-to-Settlers Court	CRK	$ 439	97	97	2	$ 531,991	$ 531,991	0.171
2032	1	0	4550	Weatherstone Court	(to) Charlotte Street-to-East End Cul de sac	CRK	$ 460	97	97	2	$ 556,879	$ 556,879	0.179
2032	1	0	4645	The Promenade	(to) Coach Drive (South)-to-Coach Drive (North)	CRK	$ 1,375	97	97	2	$ 1,664,416	$ 1,664,416	0.535
2032	1	0	5435	Lower Canada Drive	(to) Garrison Village Drive-to-Confederation Drive (West)	CRK	$ 311	97	97	2	$ 376,438	$ 376,438	0.121
2032	1	0	5450	Confederation Drive	(to) Navy Hall Circle-to-Lower Canada Drive	CRK	$ 1,357	97	97	2	$ 1,642,639	$ 1,642,639	0.528
2032	1	0	4660	Coach Drive	(to) Settlers Court-to-The Promenade (North)	CRK	$ 332	97	97	2	$ 401,327	$ 401,327	0.129
2032	1	0	4665	Settlers Court	(to) Coach Drive-to-South End Cul De Sac	CRK	$ 463	97	97	2	$ 559,991	$ 559,991	0.18
2032	1	0	540	Queenston Road	(to) 0.4km East of 55- Niagara Stone Road-to-Coon Road	CRK	$ 964	92.95	92.95	2	$ 511,188	$ 511,188	0.375
2032	1	0	26309	Counsell Street	(to) Regional Road 81- York Road-to-North End Cul De Sac	CRK	$ 460	72	72	2	$ 156,273	$ 156,273	0.179
2032	1	0	905	Concession 6 Road	(to) Line 3 Road-to-Regional Road 55 - Niagara Stone Road	SST	$ 3,304	77.27	90		$ 175,957	$ 204,945	0.071
2032	1	0	4045	Front Street	(to) Victoria Street-to-Regent Street	CRK	$ 380	92.92	92.92	2	$ 159,471	$ 159,471	0.148
2032	1	0	27369	Lampman Court	(to) 89- Glendale Avenue-to-East End Cul de sac	CRK	$ 941	92.95	92.95	2	$ 389,389	$ 389,389	0.366
2032	1	0	5140	Dorchester Street	(to) John Street West-to-Mary Street	CRK	$ 416	72	72	2	$ 127,023	$ 127,023	0.162
2032	1	0	4915	Victoria Street	(to) Anne Street-to-John Street West	CRK	$ 383	72	72	2	$ 111,150	$ 111,150	0.149
2032	1	0	170	Scott Street	(to) McNab Road-to-Irvine Road	SST	$ 29,537	62.02	90		$ 559,951	$ 812,570	0.918
2032	1	0	390	Line 6 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 35,264	62.02	90		$ 668,525	$ 970,127	1.096
2032	1	0	4065	Ricardo Street	(to) Wellington Street-to-Melville Street	CRK	$ 257	92.92	92.92	2	$ 93,812	$ 93,812	0.1
2032	1	0	4790	Ball Street	(to) Ricardo Street-to-Delater Street	SST	$ 1,441	77.26	90		$ 60,499	$ 70,475	0.071
2032	1	0	1015	Townline Road	(to) Line 1 Road-to-East and West Line	SST	$ 27,473	77.27	90		$ 1,048,220	$ 1,220,911	0.925
2032	1	0	1010	Townline Road	(to) Line 2 Road-to-Line 1 Road	SST	$ 24,767	77.27	90		$ 914,501	$ 1,065,163	0.807
2032	1	0	430	Line 7 Road	(to) Concession 5 Road-to-Regional Road 100 - Four Mile Creek Road	SST	$ 46,060	69.4	90		$ 991,885	$ 1,286,306	1.477
2032	1	0	915	Concession 6 Road	(to) Line 2 Road-to-Line 1 Road	CRK	$ 2,159	89.73	89.73	2	$ 774,272	$ 774,272	0.84
2032	1	0	645	Concession 1 Road	(to) Line 5 Road-to-Larkin Road	SST	$ 13,129	77.27	90		$ 445,051	$ 518,372	0.421
2032	1	0	4920	Victoria Street	(to) John Street West-to-Mary Street	CRK	$ 393	89.73	89.73	2	$ 137,394	$ 137,394	0.153
2032	1	0	145	Line 1 Road	(to) Concession 3 Road-to-Concession 2 Road	SST	$ 33,752	77.27	90		$ 1,108,928	$ 1,291,621	1.049
2032	1	0	175	Scott Street	(to) Irvine Road-to-Townline Road	SST	$ 29,279	77.27	90		$ 961,988	$ 1,120,472	0.91
2032	1	0	5130	Butler Street	(to) Johnson Street-to-South End	SST	$ 1,312	77.26	90		$ 40,979	$ 47,737	0.053
2032	1	0	930	Concession 7 Road	(to) 81- York Road-to-Queenston Road	CRK	$ 2,231	97	97	2	$ 1,272,257	$ 1,272,257	0.868

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2032	1	0	4570	Flynn Street	(to) Rye Street-to-Green Street	SST	$ 6,715	77.26	90		$ 205,672	$ 239,586	0.266
2032	1	0	4575	Flynn Street	(to) Green Street-to-Charlotte Street	SST	$ 3,893	77.26	90		$ 110,568	$ 128,801	0.143
2032	1	0	4300	Gage Street	(to) Mississagua Street-to-Simcoe Street	SST	$ 4,468	77.26	90		$ 118,300	$ 137,807	0.153
2032	1	0	4020	Delater Street	(to) King Street-to-Ball Street	CRK	$ 632	94.47	94.47	2	$ 246,931	$ 246,931	0.246
2032	1	0	4290	Gage Street	(to) Dorchester Street-to-Butler Street	SST	$ 4,574	77.26	90		$ 119,073	$ 138,708	0.154
2032	1	0	4295	Gage Street	(to) Butler Street-to-Mississagua Street	SST	$ 4,604	77.26	90		$ 119,846	$ 139,609	0.155
2032	1	0	4515	Anne Street	(to) 55- Mississauga Street-to-Start of Culdesac	SST	$ 2,406	77.26	90		$ 62,629	$ 72,957	0.081
2032	1	0	4285	Gage Street	(to) Dorchester Street-to-0.1km West of Dorchester Street	SST	$ 2,748	77.26	90		$ 70,982	$ 82,687	0.091
2032	1	0	5115	Butler Street	(to) Mary Street-to-William Street	SST	$ 4,865	77.26	90		$ 123,810	$ 144,226	0.156
2032	1	0	5220	Orchard Drive	(to) Lakeview Street-to-Palatine Place	CRK	$ 285	94.47	94.47	2	$ 104,944	$ 104,944	0.111
2032	1	0	4870	Regent Street	(to) John Street West-to-Mary Street	SST	$ 5,074	77.26	90		$ 125,601	$ 146,312	0.153
2032	1	0	460	Line 8 Road	(to) Concession 7 Road-to-0.3km West of Concession 7 Road	SST	$ 8,910	77.27	90		$ 218,802	$ 254,849	0.3
2032	1	0	4205	Johnson Street	(to) Niagara Boulevard-to-Palatine Place	SST	$ 2,363	77.26	90		$ 55,123	$ 64,213	0.062
2032	1	0	4855	King Street	(to) Byron Street-to-Ricardo Street	CRK	$ 386	71.17	71.17	2	$ 416,526	$ 416,526	0.15
2032	1	0	1045	Coon Road	(to) Regional Road 81- York Road-to-Queenston Road	CRK	$ 475	97	97	2	$ 199,279	$ 199,279	0.185
2032	1	0	4595	Niagara Street	(to) 0.13km South of Charlotte Street-to-East and West Line	R1	$ 46,278	70.83	95.83		$ 450,693	$ 609,769	0.317
2032	1	0	35	East and West Line	(to) Concession 4 Road-to-Regional Road 55 - Niagara Stone Road	R1	$ 62,040	70.83	95.83		$ 414,017	$ 560,147	0.384
2032	1	0	5215	Orchard Drive	(to) Lansdowne Avenue-to-Lakeview Street	R1	$ 10,414	66.91	91.91		$ 58,257	$ 80,024	0.087
2032	1	0	240	Line 3 Road	(to) Townline Road-to-Concession 7 Road	GRR2	$ 105,134	65.7	85.7		$ 646,800	$ 843,695	1.043
2032	1	0	4060	Ricardo Street	(to) Ball Street-to-Wellington Street	R1	$ 8,559	65.02	90.02		$ 41,645	$ 57,658	0.064
2032	1	0	410	Eastchester Avenue	(to) 0.06km West of 55- Niagara Stone Road-to-Regional Road 55 - Niagara	CRK	$ 154	95	95	2	$ 66,887	$ 66,887	0.06
2032	1	0	4695	Charlotte Street	(to) The Promenade (North)-to-Paffard Street	R1	$ 60,329	70.84	95.84		$ 313,541	$ 424,192	0.138
2032	1	0	3245	Casselman Boulevard	(to) Loretta Drive-to-Line 1 Road	R1	$ 56,309	70.84	95.84		$ 290,820	$ 393,453	0.128
2032	1	0	4580	Niagara Street	(to) Rye Street-to-Green Street	R1	$ 122,737	70.84	95.84		$ 633,898	$ 857,605	0.279
2032	1	0	4700	Charlotte Street	(to) Paffard Street-to-Weatherstone Court	R1	$ 9,238	70.84	95.84		$ 47,713	$ 64,551	0.021
2032	1	0	4705	Charlotte Street	(to) Weatherstone Court-to-Christopher Street	R1	$ 45,312	70.84	95.84		$ 234,019	$ 316,606	0.103
2032	1	0	4710	Charlotte Street	(to) Christopher Street-to-John Street East	R1	$ 79,185	70.84	95.84		$ 408,966	$ 553,294	0.18
2032	1	0	800	Concession 4 Road	(to) Loretta Drive-to-Line 1 Road	R1	$ 62,996	70.84	95.84		$ 301,513	$ 407,919	0.128
2032	1	0	4050	Front Street	(to) Regent Street-to-King Street	R1	$ 26,232	67.92	92.92		$ 118,141	$ 161,626	0.15
2032	1	0	585	Queenston Road	(to) Semi-Urban Section (St. David's)-to-Regional Road 81- York Road	R1	$ 51,228	70.84	95.84		$ 238,644	$ 322,863	0.302
2032	1	0	1095	Hunter Road	(to) Four Mile Creek Road-to-Concession 4 Road	BS	$ 686,408	34.13	95		$ 666,082	$ 1,854,022	1.415
2032	1	0	1140	Warner Road	(to) Concession 6 Road-to-East End Cul de sac	BS	$ 316,965	25.63	95		$ 199,015	$ 737,667	0.742
2032	1	0	510	Martin Road	(to) Queenston Road-to-Townline Road	BS	$ 291,224	25.63	95		$ 177,326	$ 657,277	0.733
2032	1	0	4190	Queen's Parade	(to) Wellington Street-to-150m East of Wellington Ave	R1	$ 88,671	68.8	93.8		$ 391,839	$ 534,222	0.15
2032	1	0	1120	Lakeshore Road	(to) Niven Road-to-87- Lakeshore Road	BS	$ 204,773	15	95		$ 62,721	$ 397,235	0.443
2032	1	0	635	Concession 1 Road	(to) Line 6 Road (East)-to-Line 6 Road (West)	BS	$ 151,443	34.13	95		$ 128,406	$ 357,416	0.275
2032	1	0	1513	Old Lakeshore Road	(to) Lakeshore Road-to-Niven Road	BS	$ 185,359	20	95		$ 75,700	$ 359,574	0.401
2032	1	0	5165	Dorchester Street	(to) Johnson Street-to-Queen Street	R2	$ 36,100	66.91	100		$ 101,783	$ 152,119	0.152
2032	1	0	820	Concession 5 Road	(to) Warner Road-to-Regional Road 81- York Road	BS	$ 205,028	22.54	95		$ 94,436	$ 398,023	0.426
2032	1	0	290	Line 4 Road	(to) Concession 7 Road-to-0.1km East of Concession 7 Road	BS	$ 56,096	20.85	95		$ 22,817	$ 103,963	0.101
2032	1	0	4315	Gage Street	(to) Victoria Street-to-Regent Street	SD	$ 2,460	81.56	81.56	2	$ 122,435	$ 122,435	0.15
2032	1	0	4365	Centre Street	(to) Mississagua Street-to-Simcoe Street	SD	$ 2,509	81.56	81.56	2	$ 124,884	$ 124,884	0.153
2032	1	0	5035	Simcoe Street	(to) John Street West-to-Mary Street	SD	$ 2,526	81.56	81.56	2	$ 125,700	$ 125,700	0.154
2032	1	0	5120	Butler Street	(to) William Street-to-Centre Street	SD	$ 2,444	81.56	81.56	2	$ 121,619	$ 121,619	0.149
2032	1	0	1180	Niagara-on-the-Green Boulevard	(to) 89- Glendale Avenue-to-Stevens Drive	MICRO	$ 10,626	59.32	59.32	3	$ 310,819	$ 310,819	0.138
2032	1	0	300	Line 4 Road	(to) 1.0km West of 100- Four Mile Creek Road-to-Regional Road 100 - Four	GRR	$ 44,226	85.7	85.7	3	$ 968,584	$ 968,584	1.08
2032	1	0	2005	Brittain Street	(to) Niagara River Parkway-to-North End	BS	$ 46,566	20	95		$ 16,557	$ 78,648	0.082
2032	1	0	610	Glenwood Crescent	(to) Melrose Drive-to-North End	BS	$ 46,717	22.17	95		$ 18,416	$ 78,912	0.083
2032	1	0	255	Line 3 Road	(to) Concession 6 Road-to-West End Cul De Sac	SD	$ 1,361	91.48	91.48	2	$ 90,465	$ 90,465	0.083
2032	1	0	398	Eastchester Avenue	(to) House 153-to-House 165 Entrance	BS	$ 51,782	25.63	95		$ 23,598	$ 87,468	0.092

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement		Cost	Start Cond	End Cond	Yrs Hold		Start Value		End Value	Length (km)
2032	1	0	2040	Partition Street	(to) Niagara River Parkway-to-Queenston Street	SD	$	3,395	91.48	91.48	2	$	214,373	$	214,373	0.207
2032	1	0	470	Line 8 Road	(to) Tanbark Road-to-0.2km West of Tanbark Road	GRR	$	8,190	85.7	85.7	3	$	161,783	$	161,783	0.2
							$	**3,524,048**								

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2033	1	0	4185	Picton Street	(to) Davy Street-to-Wellington Street	CRK	$ 391	92.95	92.95	2	$ 532,602	$ 532,602	0.152
2033	1	0	4180	Picton Street	(to) King Street-to-Davy Street	CRK	$ 401	92.95	92.95	2	$ 508,758	$ 508,758	0.156
2033	1	0	4075	Ricardo Street	(to) 0.12km East of Melville Street-to-Nelson Street	CRK	$ 239	92.95	92.95	2	$ 294,238	$ 294,238	0.093
2033	1	0	4085	Ricardo Street	(to) Collingwood Street-to-0.12km East of Collingwood Street	CRK	$ 301	92.95	92.95	2	$ 370,170	$ 370,170	0.117
2033	1	0	210	Line 2 Road	(to) Hope Avenue-to-Annmarie Drive	CRK	$ 257	92.95	92.95	2	$ 306,641	$ 306,641	0.1
2033	1	0	215	Line 2 Road	(to) Annmarie Drive-to-Concession 4 Road	CRK	$ 504	92.95	92.95	2	$ 601,017	$ 601,017	0.196
2033	1	0	5395	Garrison Village Drive	(to) Colonel Butler Crescent-to-Westgate Drive	CRK	$ 391	92.95	92.95	2	$ 456,839	$ 456,839	0.152
2033	1	0	5385	Village Drive, NOTL	(to) Niven Road-to-Garrison Village Drive	CRK	$ 200	92.95	92.95	2	$ 232,531	$ 232,531	0.078
2033	1	0	11020	Garrison Village Drive	(to) Jordan Street-to-Regional Road 55 - Niagara Stone Road	CRK	$ 434	92.95	92.95	2	$ 503,817	$ 503,817	0.169
2033	1	0	3080	Henry Street	(to) Line 1 Road-to-Pine Street	CRK	$ 393	92.95	92.95	2	$ 456,118	$ 456,118	0.153
2033	1	0	3235	Loretta Drive	(to) Bianca Drive-to-Concession 4 Road	CRK	$ 293	92.95	92.95	2	$ 339,852	$ 339,852	0.114
2033	1	0	695	Concession 2 Road	(to) Line 8 Road-to-Line 7 Road	CRK	$ 2,169	92.95	92.95	2	$ 1,438,639	$ 1,438,639	0.844
2033	1	0	10020	Bunny Glen Drive	(to) Apricot Glen Drive-to-Red Haven Drive	CRK	$ 249	97	97	2	$ 301,773	$ 301,773	0.097
2033	1	0	10030	Bunny Glen Drive	(to) Red Haven Drive-to-Creekside Drive	CRK	$ 537	97	97	2	$ 650,211	$ 650,211	0.209
2033	1	0	4640	The Promenade	(to) Charlotte Street-to-Coach Drive (South)	CRK	$ 239	97	97	2	$ 289,329	$ 289,329	0.093
2033	1	0	4650	The Promenade	(to) Coach Drive (North)-to-Charlotte Street	CRK	$ 496	97	97	2	$ 600,434	$ 600,434	0.193
2033	1	0	5440	Lower Canada Drive	(to) Confederation Drive (West)-to-Confederation Drive (East)	CRK	$ 578	97	97	2	$ 699,988	$ 699,988	0.225
2033	1	0	5545	Navy Hall Circle	(to) Confederation Drive-to-East End Cul de sac	CRK	$ 465	97	97	2	$ 563,101	$ 563,101	0.181
2033	1	0	3035	Frontier Drive	(to) Cherry Street-to-Hearth Court	CRK	$ 401	97	97	2	$ 485,325	$ 485,325	0.156
2033	1	0	4565	James Street	(to) Charlotte Street-to-West End	CRK	$ 563	97	97	2	$ 681,321	$ 681,321	0.219
2033	1	0	10010	Apricot Glen Drive	(to) Tanbark Road-to-Bunny Glen Drive	CRK	$ 301	97	97	2	$ 363,993	$ 363,993	0.117
2033	1	0	700	Concession 2 Road	(to) Line 7 Road-to-Line 6 Road	CRK	$ 2,167	92.95	92.95	2	$ 1,149,151	$ 1,149,151	0.843
2033	1	0	4485	John Street West	(to) Victoria Street-to-Regent Street	CRK	$ 383	85.18	85.18	2	$ 133,737	$ 133,737	0.149
2033	1	0	4050	Front Street	(to) Regent Street-to-King Street	CRK	$ 386	92.92	92.92	2	$ 161,626	$ 161,626	0.15
2033	1	0	140	Line 1 Road	(to) Concession 4 Road-to-Concession 3 Road	SST	$ 32,248	77.27	90		$ 1,513,359	$ 1,762,681	1.068
2033	1	0	5205	Palatine Place	(to) Orchard Drive-to-Johnson Street	CRK	$ 185	76.92	76.92	2	$ 55,425	$ 55,425	0.072
2033	1	0	4060	Ricardo Street	(to) Ball Street-to-Wellington Street	CRK	$ 164	90.02	90.02	2	$ 57,658	$ 57,658	0.064
2033	1	0	65	Church Road	(to) Read Road-to-86- Stewart Road	SST	$ 27,383	77.27	90		$ 974,673	$ 1,135,247	0.922
2033	1	0	80	Church Road	(to) Irvine Road-to-Townline Road	SST	$ 27,749	77.27	90		$ 971,502	$ 1,131,554	0.919
2033	1	0	95	Line 1 Road	(to) Concession 7 Road-to-0.2km West of Concession 6 Road	SST	$ 27,063	77.27	90		$ 931,838	$ 1,085,356	0.804
2033	1	0	150	Line 1 Road	(to) Concession 2 Road-to-Concession 1 Road	SST	$ 35,843	77.27	90		$ 1,177,642	$ 1,371,655	1.114
2033	1	0	335	Line 5 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 5 Road	SST	$ 38,224	77.27	90		$ 1,255,869	$ 1,462,770	1.188
2033	1	0	370	Line 6 Road	(to) Concession 6 Road-to-Concession 5 Road	SST	$ 31,338	77.27	90		$ 1,029,644	$ 1,199,274	0.974
2033	1	0	495	Line 8 Road	(to) Concession 1 Road-to-Niagara River Parkway	SST	$ 29,215	77.27	90		$ 959,873	$ 1,118,010	0.908
2033	1	0	270	Line 3 Road	(to) Concession 4 Road-to-Concession 3 Road	CRK	$ 2,747	97	97	2	$ 1,441,695	$ 1,441,695	1.069
2033	1	0	275	Line 3 Road	(to) Concession 3 Road-to-Concession 2 Road	CRK	$ 2,675	97	97	2	$ 1,403,933	$ 1,403,933	1.041
2033	1	0	830	Concession 5 Road	(to) 0.2km North of Queenston Road-to-Line 8 Road	SST	$ 21,636	77.27	90		$ 522,818	$ 608,951	0.705
2033	1	0	1030	Irvine Road	(to) Scott Street-to-Church Road	SST	$ 34,753	77.27	90		$ 826,952	$ 963,190	1.097
2033	1	0	340	Line 5 Road	(to) Regional Road 100 - Four Mile Creek Road-to-Concession 3 Road	SST	$ 32,718	77.27	90		$ 756,526	$ 881,161	0.972
2033	1	0	1070	Read Road	(to) 83- Carleton Street-to-Seaway Haulage Road	CRK	$ 1,259	97	97	2	$ 519,269	$ 519,269	0.49
2033	1	0	680	Concession 2 Road	(to) 0.3km North of 81- York Road-to-Line 9 Road	R1	$ 93,100	70.83	95.83		$ 865,842	$ 1,171,448	0.605
2033	1	0	60	East and West Line	(to) Concession 1 Road-to-Niagara River Parkway	R1	$ 138,141	70.83	95.83		$ 1,193,287	$ 1,614,467	0.868
2033	1	0	50	East and West Line	(to) Concession 2 Road-to-Niagara Street	R1	$ 74,880	70.83	95.83		$ 641,208	$ 867,527	0.451
2033	1	0	685	Concession 2 Road	(to) Line 9 Road-to-Arnold Road	R1	$ 89,112	70.83	95.83		$ 698,050	$ 944,432	0.672
2033	1	0	690	Concession 2 Road	(to) Arnold Road-to-Line 8 Road	R1	$ 21,403	70.83	95.83		$ 163,086	$ 220,649	0.157
2033	1	0	710	Concession 2 Road	(to) Line 5 Road-to-Larkin Road	R1	$ 57,460	70.83	95.83		$ 436,281	$ 590,270	0.42
2033	1	0	4510	John Street East	(to) Charlotte Street-to-Niagara River Parkway	R1	$ 171,955	70.83	95.83		$ 1,220,487	$ 1,651,267	1.132
2033	1	0	405	Eastchester Avenue	(to) Stewart Road-to-0.06km West of 55- Niagara Stone Road	GRR2	$ 73,361	65.7	85.7		$ 538,897	$ 702,945	0.869
2033	1	0	55	East and West Line	(to) Niagara Street-to-Concession 1 Road	R1	$ 110,079	70.83	95.83		$ 740,951	$ 1,002,475	0.663
2033	1	0	4430	Mary Street	(to) Nassau Street-to-87- Mary Street	R1	$ 20,547	70.84	95.84		$ 126,381	$ 170,981	0.127

Town of Niagara-on-the-Lake

10 Year Program from Performance Model 20231106

Year	Fund	Proj	Asset ID	Street Name	Description	Improvement	Cost	Start Cond	End Cond	Yrs Hold	Start Value	End Value	Length (km)
2033	1	0	1165	Sheppard Crescent	(to) 81- York Road-to-End	R1	$ 66,194	69.47	94.47		$ 362,300	$ 492,680	0.148
2033	1	0	5210	Palatine Place	(to) Johnson Street-to-Niagara Boulevard	R1	$ 8,303	69.47	94.47		$ 45,191	$ 61,454	0.065
2033	1	0	5550	Samuel Street	(to) Niven Road-to-Garrison Village Drive	R1	$ 60,200	69.47	94.47		$ 323,074	$ 439,337	0.145
2033	1	0	4765	Rye Street	(to) Flynn Street-to-Paffard Street	R1	$ 85,256	69.47	94.47		$ 454,531	$ 618,102	0.204
2033	1	0	4930	Victoria Street	(to) William Street-to-Centre Street	R1	$ 20,411	64.32	89.32		$ 99,774	$ 138,554	0.155
2033	1	0	5125	Butler Street	(to) Centre Street-to-Gage Street	R1	$ 19,414	69.47	94.47		$ 102,895	$ 139,924	0.148
2033	1	0	4805	King Street	(to) Cottage Street-to-Paffard Street	R1	$ 39,989	69.47	94.47		$ 210,521	$ 286,281	0.295
2033	1	0	4690	Charlotte Street	(to) James Street-to-The Promenade (North)	R1	$ 32,788	70.84	95.84		$ 170,403	$ 230,539	0.075
2033	1	0	3225	Loretta Drive	(to) Fisher Drive-to-Casselman Boulevard	R1	$ 44,872	70.84	95.84		$ 231,747	$ 313,533	0.102
2033	1	0	4480	John Street West	(to) Gate Street-to-Victoria Street	R1	$ 21,461	70.84	95.84		$ 111,222	$ 150,474	0.149
2033	1	0	5075	Anderson Lane	(to) 55- Mississauga Street-to-Simcoe Street	R1	$ 113,939	70.84	95.84		$ 588,457	$ 796,128	0.259
2033	1	0	3210	Bianca Drive	(to) Loretta Drive-to-Loretta Drive	R1	$ 75,226	65.01	90.01		$ 356,543	$ 493,654	0.171
2033	1	0	3145	Field Road	(to) Regional Road 100 - Four Mile Creek Road-to-Elden Street	R1	$ 86,122	69.47	94.47		$ 438,934	$ 596,893	0.197
2033	1	0	4035	Front Street	(to) Simcoe Street-to-Gate Street	R1	$ 63,389	69.47	94.47		$ 323,074	$ 439,337	0.145
2033	1	0	10040	Bunny Glen Drive	(to) Creekside Drive-to-South End Cul De Sac	R1	$ 54,110	69.47	94.47		$ 274,056	$ 372,679	0.123
2033	1	0	10060	Creekside Drive	(to) Red Haven Drive-to-Four Mile Creek Road	R1	$ 101,181	69.47	94.47		$ 512,461	$ 696,880	0.23
2033	1	0	11000	Frontier Drive	(to) Bordeaux Drive-to-Pinot Trail (P)	R1	$ 32,554	69.47	94.47		$ 164,879	$ 224,213	0.074
2033	1	0	3110	Andres Street	(to) Cherry Street-to-Henry Street	R1	$ 80,065	69.47	94.47		$ 405,513	$ 551,444	0.182
2033	1	0	3160	Hope Avenue	(to) Line 2 Road-to-Raiana Drive	R1	$ 76,546	69.47	94.47		$ 387,688	$ 527,205	0.174
2033	1	0	3230	Loretta Drive	(to) Casselman Boulevard-to-Bianca Drive	R1	$ 37,833	69.47	94.47		$ 191,616	$ 260,573	0.086
2033	1	0	3240	Fisher Drive	(to) Loretta Drive-to-Loretta Drive	R1	$ 101,181	69.47	94.47		$ 512,461	$ 696,880	0.23
2033	1	0	4250	Johnson Street	(to) Victoria Street-to-Regent Street	R1	$ 65,108	69.47	94.47		$ 329,758	$ 448,427	0.148
2033	1	0	4275	Market Street	(to) King Street-to-West End	R1	$ 25,075	69.47	94.47		$ 127,002	$ 172,705	0.057
2033	1	0	4750	Park Court	(to) John Street East-to-John Street East	R1	$ 145,613	69.47	94.47		$ 737,499	$ 1,002,901	0.331
2033	1	0	4910	Victoria Street	(to) Simcoe Street-to-Anne Street	R1	$ 166,729	69.47	94.47		$ 844,448	$ 1,148,338	0.379
2033	1	0	5010	Simcoe Street	(to) South End-to-Victoria Street	R1	$ 28,595	69.47	94.47		$ 144,826	$ 196,944	0.065
2033	1	0	5370	Bay Berry Lane	(to) 87- Lakeshore Road-to-Bay Berry Lane (East)	R1	$ 47,511	69.47	94.47		$ 240,634	$ 327,231	0.108
2033	1	0	5375	Bay Berry Lane	(to) Bay Berry Lane (North)-to-West End Cul De Sac	R1	$ 55,430	69.47	94.47		$ 280,740	$ 381,769	0.126
2033	1	0	9070	Smallwood Crescent	(to) Queenston Road-to-Paxton Lane	R1	$ 223,478	69.47	94.47		$ 1,131,872	$ 1,539,196	0.508
2033	1	0	4770	Cottage Street	(to) King Street-to-Rye Street	R1	$ 12,482	69.47	94.47		$ 62,793	$ 85,390	0.083
2033	1	0	5475	Southgate Circle	(to) Upper Canada Drive-to-North End Cul De Sac	R1	$ 53,563	69.47	94.47		$ 269,599	$ 366,619	0.121
2033	1	0	5480	Tottenham Court	(to) Garrison Village Drive-to-East End Cul de sac	R1	$ 65,072	69.47	94.47		$ 327,530	$ 445,398	0.147
2033	1	0	5485	Northgate Circle	(to) Colonel Butler Crescent-to-South End Cul De Sac	R1	$ 73,925	69.47	94.47		$ 372,092	$ 505,995	0.167
2033	1	0	5505	Colonel Butler Crescent	(to) Loyalist Court-to-Upper Canada Drive	R1	$ 49,579	69.47	94.47		$ 249,547	$ 339,350	0.112
2033	1	0	5390	Garrison Village Drive	(to) 87- Lakeshore Road-to-Colonel Butler Crescent	R1	$ 30,739	70.84	95.84		$ 148,889	$ 201,433	0.065
2033	1	0	290	Line 4 Road	(to) Concession 7 Road-to-0.1km East of Concession 7 Road	CRK	$ 260	95	95	2	$ 103,963	$ 103,963	0.101
2033	1	0	4155	Queen Street	(to) Mississagua Street-to-Simcoe Street	R1	$ 51,068	70.84	95.84		$ 244,673	$ 331,020	0.153
2033	1	0	610	Glenwood Crescent	(to) Melrose Drive-to-North End	CRK	$ 213	95	95	2	$ 78,912	$ 78,912	0.083
2033	1	0	5215	Orchard Drive	(to) Lansdowne Avenue-to-Lakeview Street	CRK	$ 224	91.91	91.91	2	$ 80,024	$ 80,024	0.087
2033	1	0	4860	King Street	(to) Ricardo Street-to-Delater Street	SD	$ 1,066	89.73	89.73	2	$ 63,002	$ 63,002	0.065
							$ 3,524,740						

Appendix H: Potential Substandard Vertical and Horizontal Alignment

Geometric Needs By Asset ID

Current Insp - Rural w/Curve Needs Only

Asset ID	Street Name	From Description	To Description	Length	RDSD	AADT	Limit	Op. Speed	TON	H.Curve	H. SSD	V. Curve	V.SSD
1015	Townline Road	Line 1 Road	East and West Line	0.925	R	1,021	80	75	ADEQ	2	0	0	0
1020	Townline Road	East and West Line	Lakeshore Road	0.246	R	100	80	65	ADEQ	1	0	0	0
10200	Four Mile Creek Road	East and West Line	Hunter Road	1.020	R	1,769	60	60	ADEQ	1	0	0	0
10210	Four Mile Creek Road	Hunter Road	Wall Road	0.773	R	1,500	60	60	ADEQ	2	0	0	0
1055	McNab Road	Scott Street	Church Road	1.051	R	86	70	70	ADEQ	0	0	0	2
1060	McNab Road	Church Road	87- Lakeshore Road	1.051	R	120	70	70	ADEQ	0	0	0	1
1070	Read Road	83- Carleton Street	Seaway Haulage Road	0.490	R	25	60	60	ADEQ	1	0	0	0
1100	Hunter Road	Concession 4 Road	Regional Road 55 - Niagara Stone Road	1.152	R	415	50	50	ADEQ	1	0	0	0
1130	Warner Road	Garner Road	East End Cul de sac	0.689	R	24	50	50	ADEQ	0	0	0	1
1135	Warner Road	Concession 6 Road	West End Cul De Sac	1.134	R	200	70	60	ADEQ	2	0	0	0
1145	Warner Road	West End Cul De Sac	Concession 5 Road	0.284	R	40	50	50	ADEQ	1	0	0	0
165	Scott Street	Stewart Road	McNab Road	0.945	R	643	80	80	ADEQ	0	0	0	2
170	Scott Street	McNab Road	Irvine Road	0.918	R	350	80	80	ADEQ	0	0	0	1
250	Line 3 Road	0.1km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	0.100	R	250	80	55	NOW	2	0	0	0
290	Line 4 Road	Concession 7 Road	0.1km East of Concession 7 Road	0.101	R	140	80	60	NOW	1	0	0	0
410	Eastchester Avenue	0.06km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	0.060	R	175	80	60	NOW	1	0	0	0
5	East and West Line	87- Lakeshore Road	Townline Road	0.253	R	3,250	80	65	ADEQ	1	0	0	0
510	Martin Road	Queenston Road	Townline Road	0.733	R	150	70	70	ADEQ	0	0	0	1
530	Line 9 Road	Concession 1 Road	Concession 2 Road	1.063	R	483	60	60	ADEQ	1	0	0	0
580	Queenston Road	Concession 5 Road	Semi-Urban Section (St. David's)	0.941	R	837	70	70	ADEQ	1	0	0	0
675	Concession 2 Road	81- York Road	0.3km North of 81- York Road	0.300	R	1,582	50	50	ADEQ	2	0	1	0
70	Church Road	86- Stewart Road	McNab Road	0.928	R	615	80	80	ADEQ	0	0	0	1
75	Church Road	McNab Road	Irvine Road	0.946	R	654	60	60	ADEQ	0	0	0	1
825	Concession 5 Road	Queenston Road	0.2km North of Queenston Road	0.201	R	350	80	80	ADEQ	0	0	0	1
850	Concession 6 Road	Niagara Falls Boundary	Warner Road	0.365	R	2,300	80	70	ADEQ	0	0	0	2
865	Concession 6 Road	Regional Road 81- York Road	Queenston Road	0.847	R	2,308	60	60	ADEQ	0	0	1	0
870	Concession 6 Road	Queenston Road	Line 8 Road	0.836	R	1,550	80	80	ADEQ	0	0	0	1
955	Concession 7 Road	Line 5 Road	Regional Road 55 - Niagara Stone Road	0.842	R	1,355	80	75	ADEQ	1	0	0	0
960	Concession 7 Road	Regional Road 55 - Niagara Stone Road	Line 3 Road	0.755	R	200	80	75	ADEQ	1	0	0	0
				19.949									

Appendix I: 'NOW' Surface Width Needs

Asset ID	Street Name	From Desc	To Desc	Length (km)	AADT	RDSD	Surface Width	Width (m)	Lanes
			Now Needs Surface Width						
09040	Garrison Village Drive	Samuel Street	Garrison Village Drive	0.055	600	U	NOW	4.1	1
1040	Irvine Road	Lakeshore Road	North End	0.946	260	R	NOW	4.5	2
1093	Read Road	Northrup Crescent	North End	0.301	30	R	NOW	3.2	2
1135	Warner Road	Concession 6 Road	West End Cul De Sac	1.134	200	R	NOW	5	2
1140	Warner Road	Concession 6 Road	East End Cul de sac	0.742	60	R	NOW	4.5	2
1150	Warner Road	Concession 5 Road	0.3km West of Tanbark Road	0.781	576	R	NOW	5.5	2
165	Scott Street	Stewart Road	McNab Road	0.945	643	R	NOW	5.8	2
2010	Dee Road	Niagara River Parkway	0.2km East of the Niagara River Parkway	0.2	100	S	NOW	4	2
2045	Partition Street	Queenston Street	Front Street South	0.119	100	S	NOW	3.9	2
2060	Clarence Street	Kent Street	Queenston Street	0.267	100	S	NOW	4.5	2
2160	Maple Street	Princess Street	Front Street South	0.063	30	S	NOW	3	2
24264	Palatine Place	Circle Street	End	0.074	20	S	NOW	4	2
24411	Front Street South	Maple Street	Highlander Street	0.103	20	S	NOW	4.3	2
265	Line 3 Road	Regional Road 100 - Four Mile Creek Road	Concession 4 Road	0.489	4366	R	NOW	6.2	2
28613	Eastchester Avenue	West End	House 153	0.058	50	R	NOW	3	2
360	Welland Avenue	Regional Road 88 - Stewart Road	East End	0.2	30	R	NOW	4.5	2
415	Line 7 Road	Concession 7 Road	0.9km West of Concession 7 Road	0.891	20	R	NOW	4.4	2
4335	Lansdowne Avenue	Niagara Boulevard	Orchard Drive	0.121	100	S	NOW	4.6	2
465	Line 8 Road	Concession 5 Road	0.1km West of Concession 5 Road	0.1	10	R	NOW	3.5	2
4790	Ball Street	Ricardo Street	Delater Street	0.071	100	S	NOW	4.1	2
4795	Ball Street	Delater Street	North End	0.051	30	S	NOW	4	2
500	Arnold Road	Concession 2 Road	0.05km East of Concession 2 Road	0.05	30	R	NOW	4	2
505	Arnold Road	Concession 1 Road	0.5km West of Concession 1 Road	0.5	30	R	NOW	4.5	2
510	Martin Road	Queenston Road	Townline Road	0.733	150	R	NOW	4.7	2
5285	Luther Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	0.196	80	S	NOW	4.7	2
5290	Wyckliffe Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	0.259	150	S	NOW	4.5	2
5295	Vincent Avenue	Chautauqua Amphitheatre	Niagara Boulevard	0.322	237	S	NOW	4.4	2
5305	Wilberforce Avenue	Chautauqua Amphitheatre	Niagara Boulevard	0.272	250	S	NOW	4.7	2
5310	Wesley Avenue	Chautauqua Amphitheatre	North End	0.144	100	S	NOW	4.5	2
5421	Garrison Village Drive	Samuel Street	Elizabeth Street	0.042	600	U	NOW	4.1	1
675	Concession 2 Road	81- York Road	0.3km North of 81- York Road	0.3	3000	R	NOW	6.1	2
745	Concession 3 Road	Line 8 Road	0.3km North of Line 8 Road	0.3	30	R	NOW	4.5	2
750	Concession 3 Road	Line 5 Road	0.2km North of Line 5 Road	0.2	30	R	NOW	3	2

Asset ID	Street Name	From Desc	To Desc	Length (km)	AADT	RDSD	Surface Width	Width (m)	Lanes
			Now Needs Surface Width						
755	Concession 3 Road	Line 3 Road	0.5km North of Line 3 Road	0.533	30	R	NOW	4	2
760	Concession 3 Road	Line 1 Road	0.5km South of Line 1 Road	0.5	30	R	NOW	4	2
865	Concession 6 Road	Regional Road 81- York Road	Queenston Road	0.847	3041	R	NOW	6.2	2
990	Townline Road	Martin Road	House 499 Entrance	0.4	20	R	NOW	4	2
ORAA	Line 4 Road	1.0km West of Four Mile Creek Road	Concession 6 Road	0.968	1	R	NOW	4	2
ORAC	Eastchester Avenue	Regional Road 90- Airport Road	0.2km West of 90- Airport Road	0.2	1	R	NOW	4.5	2
ORAJ	Dee Road	Niagara River Parkway	Concession 1 Road	0.83	1	R	NOW	3	2
ORAS	Concession 3 Road	Line 1 Road	East and West Line	0.911	1	R	NOW	4.5	2
ORAX	McNab Road	Queenston Road	Regional Road 55 - Niagara Stone Road	1.422	1	R	NOW	3	2
ORAY	McNab Road	Regional Road 55 - Niagara Stone Road	83- Carleton Street	2.062	1	R	NOW	3	2
ORAZ	Dee Road	Queenston Street	0.2km East of the Niagara River Parkway	0.122	30	S	NOW	3	2
			Total	**19.824**					

Appendix J: Critical Deficiencies by Asset ID

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
01513	Old Lakeshore Road	Lakeshore Road	Niven Road	0.401	50	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
08337	Harvest Drive	0.1 km West of Homestead	West End	0.039	40	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
08388	Plantation Drive	129m West of Homestead Drive	West End	0.020	105	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
08736	Highlander Street	Princess Street	Front Street South	0.047	20	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	ADEQ
09040	Garrison Village Drive	Samuel Street	Garrison Village Drive	0.055	600	ADEQ	ADEQ	ADEQ	ADEQ	NOW	ADEQ	NONE	NOW
09042	Samuel Street	Garrison Village Drive	Garrison Village Drive	0.025	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
09127	Lakeshore Road	Townline Road	Lakeshore Road	0.056	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10	East and West Line	Townline Road	Concession 6 Road	2.027	3,250	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
100	Line 1 Road	0.2km West of Concession 6 Road	Concession 6 Road	0.201	1,000	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
1000	Townline Road	Line 3 Road	Scott Street	0.520	1,456	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SST+	6-10
10010	Apricot Glen Drive	Tanbark Road	Bunny Glen Drive	0.117	600	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
10020	Bunny Glen Drive	Apricot Glen Drive	Red Haven Drive	0.097	600	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
10030	Bunny Glen Drive	Red Haven Drive	Creekside Drive	0.209	600	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
10040	Bunny Glen Drive	Creekside Drive	South End Cul De Sac	0.123	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
1005	Townline Road	Scott Street	Line 2 Road	0.315	1,260	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	DSTrehal	6-10
10050	Red Haven Drive	Bunny Glen Drive	Creekside Drive	0.285	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
10055	Creekside Drive	Bunny Glen Drive	Red Haven Drive	0.079	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10060	Creekside Drive	Red Haven Drive	Four Mile Creek Road	0.230	942	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10070	David Secord Drive	Four Mile Creek Road	Old Mill Lane	0.102	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10075	David Secord Drive	Old Mill Lane	Goring Way	0.083	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10080	Old Mill Lane	David Secord Drive	Goring Way	0.103	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10085	Paxton Lane	Old Mill Lane	Goring Way	0.078	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10090	Paxton Lane	Goring Way	Goring Way	0.311	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1010	Townline Road	Line 2 Road	Line 1 Road	0.807	1,174	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTrehal	1-5
10100	Paxton Lane	Goring Way	North End Cul De Sac	0.158	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10110	Goring Way	Paxton Lane	David Secord Drive	0.099	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10120	Goring Way	David Secord Drive	Glockner Lane	0.088	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10130	Goring Way	Glockner Lane	Paxton Lane	0.160	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10140	Goring Way	David Lowrey Court	East End Cul de sac	0.097	60	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1015	Townline Road	Line 1 Road	East and West Line	0.925	1,021	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTrehal	1-5
10150	Glockner Lane	Goring Way	West End Cul De Sac	0.143	20	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10170	Four Mile Creek Road	Niagara Stone Road	Field Road	0.306	2,643	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10180	Four Mile Creek Road	Field Road	Penner Street	0.196	4,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
10190	Four Mile Creek Road	Penner Street	Pleasant Lane	0.285	3,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
10195	Four Mile Creek Road	Pleasant Lane	East and West Line	0.605	2,500	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
1020	Townline Road	East and West Line	Lakeshore Road	0.246	100	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	REC	NOW
10200	Four Mile Creek Road	East and West Line	Hunter Road	1.020	1,769	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
10210	Four Mile Creek Road	Hunter Road	Wall Road	0.773	1,500	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
10220	Four Mile Creek Road	Wall Road	Lakeshore Road	0.594	1,500	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
1025	Townline Road	Lakeshore Road	North End	0.383	150	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
1030	Irvine Road	Scott Street	Church Road	1.097	75	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1035	Irvine Road	Church Road	Lakeshore Road	1.099	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
1040	Irvine Road	Lakeshore Road	North End	0.946	260	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	REC	NOW
1045	Coon Road	Regional Road 81- York Road	Queenston Road	0.185	200	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
105	Line 1 Road	Concession 6 Road	Homestead Drive	0.527	1,292	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
1050	McNab Road	83- Carleton Street	Scott Street	1.097	128	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
1055	McNab Road	Scott Street	Church Road	1.051	86	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
1060	McNab Road	Church Road	87- Lakeshore Road	1.051	120	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
1065	McNab Road	87- Lakeshore Road	Fire Road 14D	0.850	400	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	REC	1-5
1070	Read Road	83- Carleton Street	Seaway Haulage Road	0.490	25	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	ADEQ
1075	Read Road	Carlton Street	Scott Street	0.273	2,400	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
1080	Read Road	Scott Street	Church Road	1.061	2,400	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
1085	Read Road	Church Road	87- Lakeshore Road	1.162	2,000	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
1090	Read Road	87- Lakeshore Road	Northrup Crescent	0.545	120	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
1093	Read Road	Northrup Crescent	North End	0.301	30	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	REC	ADEQ
1095	Hunter Road	Four Mile Creek Road	Concession 4 Road	1.415	607	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	BS	1-5
110	Line 1 Road	Homestead Drive	Henry Street	0.195	2,000	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
1100	Hunter Road	Concession 4 Road	Regional Road 55 - Niagara Stone Road	1.152	415	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
11000	Frontier Drive	Bordeaux Drive	Pinot Trail (P)	0.074	74	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11010	Frontier Drive	Pinot Trail (P)	West End	0.028	28	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11020	Garrison Village Drive	Jordan Street	Regional Road 55 - Niagara Stone Road	0.169	1,000	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
11030	Garrison Village Drive	Colonel Cohoe Street	Brock Street	0.039	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11040	Brock Street	Norton Street	Blackbird Street	0.072	72	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1105	Wall Road	Four Mile Creek Road	East End Cul de sac	1.186	431	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
11050	Norton Street	Jordan Street	Macdonell Road	0.056	56	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11060	Norton Street	Brock Street	Jordan Street	0.129	129	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11070	Murray Street	Brock Street	Macdonell Road	0.140	140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11080	Brock Street	Kirby Street	Murray Street	0.055	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11090	Kirby Street	Brock Street	Macdonell Road	0.158	158	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1110	Niven Road	87- Lakeshore Road	350m South of 87 Lakeshore Road	0.350	1,002	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11100	Brock Street	Norton Street	Kirby Street	0.080	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1110A	Niven Road	350m South of 87 Lakeshore Road	670m South of 87- Lakeshore Road	0.320	297	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
1110B	Niven Road	670m South of 87- Lakeshore Road	Village Drive, NOTL	0.611	297	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	BS	6-10
11110	Jordan Street	Blackbird Street	Norton Street	0.077	77	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11120	Jordan Street	Garrison Village Drive	Blackbird Street	0.069	69	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11130	Blackbird Street	Brock Street	Jordan Street	0.114	114	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11140	Brock Street	Garrison Village Drive	Blackbird Street	0.045	45	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
1115	Niven Road	Village Road	Regional Road 55 - Niagara Stone Road	0.656	2,000	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11150	Brock Street	Garrison Village Drive	Garrison Village Drive	0.035	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11160	Garrison Village Drive	Garrison Village Drive	Brock Street	0.086	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11170	Garrison Village Drive	Brock Street	Jordan Street	0.126	702	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11180	Macdonell Road	Norton Street	Kirby Street	0.129	129	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11190	Macdonell Road	Kirby Street	Murray Street	0.079	79	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1120	Lakeshore Road	Niven Road	87- Lakeshore Road	0.443	50	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
11200	Evergreen Lane	King Street	West End	0.131	130	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11210	Sorenson Court	Cul De Sac	Cul De Sac	0.072	70	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11220	Sorenson Court	Concession 4 Road	Cul De Sac	0.158	160	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11230	Keith Crescent	Wright Crescent	Wright Crescent	0.406	410	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11240	Durham Way	Wright Crescent	Wright Crescent	0.121	120	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
11250	Stoneridge Crescent	Tanbark Road	Stoneridge Crescent	0.505	510	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
11260	Angels Drive	Warner Road	Tanbark Road	0.345	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
1130	Warner Road	Garner Road	East End Cul de sac	0.689	24	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	BS	ADEQ
1135	Warner Road	Concession 6 Road	West End Cul De Sac	1.134	200	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	BS	NOW
1140	Warner Road	Concession 6 Road	East End Cul de sac	0.742	60	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	BS	NOW
1145	Warner Road	West End Cul De Sac	Concession 5 Road	0.284	40	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
115	Line 1 Road	Henry Street	Four Mile Creek Road	0.221	2,175	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
1150	Warner Road	Concession 5 Road	0.3km West of Tanbark Road	0.781	576	ADEQ	6-10	ADEQ	ADEQ	NOW	NOW	BS	NOW
1155	Warner Road	0.3km West of Tanbark Road	Tanbark Road	0.301	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1160	Warner Road	Tanbark Road	Regional Road 100 - Four Mile Creek Road	0.459	563	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1165	Sheppard Crescent	81- York Road	End	0.148	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
1170	Paxton Lane	Regional Road 81- York Road	0.3km South of 81- York Road	0.320	300	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
1175	Johanna Drive	Regional Road 100 - Four Mile Creek Road	West End Cul De Sac	0.089	20	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1180	Niagara-on-the-Green Boulevard	89- Glendale Avenue	Stevens Drive	0.138	1,741	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
1185	Niagara-on-the-Green Boulevard	Stevens Drive	Robertson Road	0.063	1,338	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
1190	Niagara-on-the-Green Boulevard	Robertson Road	Cole Crescent	0.065	1,200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
1195	Niagara-on-the-Green Boulevard	Cole Crescent	South End Cul De Sac	0.094	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
120	Penner Street	Four Mile Creek Road	Elden Street	0.287	1,400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1200	Stevens Drive	Niagara-on-the-Green Boulevard	Cole Crescent	0.056	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1205	Stevens Drive	Cole Crescent	Cole Crescent	0.189	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1210	Robertson Road	Niagara-on-the-Green Blvd.	Cole Crescent	0.219	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
1215	Cole Crescent	Niagara-on-the-Green Boulevard	Robertson Road	0.252	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1220	Cole Crescent	Robertson Road	Stevens Drive	0.065	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
1225	Cole Crescent	Stevens Drive	Stevens Drive	0.360	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
125	Penner Street	Elden Street	Regional Road 55 - Niagara Stone Road	0.272	2,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
130	Line 1 Road	Regional Road 55 - Niagara Stone Road	Casselman Boulevard	0.293	1,810	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
135	Line 1 Road	Casselman Boulevard	Concession 4 Road	0.202	973	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
140	Line 1 Road	Concession 4 Road	Concession 3 Road	1.068	781	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	DSTrehal	6-10
145	Line 1 Road	Concession 3 Road	Concession 2 Road	1.049	850	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTrehal	1-5
15	East and West Line	Concession 6 Road	0.5km East of Concession Road 6	0.500	3,513	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
150	Line 1 Road	Concession 2 Road	Concession 1 Road	1.114	850	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
155	Line 1 Road	Concession 1 Road	Niagara River Parkway	1.058	170	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
160	Scott Street	Read Road	Stewart Road	0.918	200	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
165	Scott Street	Stewart Road	McNab Road	0.945	643	ADEQ	6-10	ADEQ	6-10	NOW	ADEQ	SST++	NOW
170	Scott Street	McNab Road	Irvine Road	0.918	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
175	Scott Street	Irvine Road	Townline Road	0.910	461	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
180	Line 2 Road	Townline Road	Concession 7 Road	1.046	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
185	Line 2 Road	Concession 7 Road	Concession 6 Road	0.978	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
190	Line 2 Road	Concession 6 Road	0.1km West of 55- Niagara Stone Road	0.547	940	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
195	Line 2 Road	0.1km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	0.100	1,092	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
20	East and West Line	0.5km East of Concession Road 6	Regional Road 100 - Four Mile Creek Road	0.456	3,250	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
200	Line 2 Road	Regional Road 100 - Four Mile Creek Road	West End	0.100	50	ADEQ	1-5	ADEQ	NOW	ADEQ	NOW	RSS	NOW
2005	Brittain Street	Niagara River Parkway	North End	0.082	100	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
2010	Dee Road	Niagara River Parkway	0.2km East of the Niagara River Parkway	0.200	100	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	RSS	NOW
2015	Walnut Street	Queenston Street	Princess Street	0.091	170	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2020	Highlander Street	Niagara River Parkway	Queenston Street	0.207	130	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
2025	Highlander Street	Queenston Street	Princess Street	0.100	150	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2030	Dumfries Street	Niagara River Parkway	Queenston Street	0.208	220	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
2035	Dumfries Street	Queenston Street	Princess Street	0.112	100	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2040	Partition Street	Niagara River Parkway	Queenston Street	0.207	250	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
2045	Partition Street	Queenston Street	Front Street South	0.119	100	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	RSS	NOW
205	Line 2 Road	Regional Road 100 - Four Mile Creek Road	Hope Avenue	0.511	1,405	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2050	Kent Street	Niagara River Parkway	Queenston Street	0.208	170	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2055	Kent Street	Queenston Street	Front Street South	0.104	100	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2060	Clarence Street	Kent Street	Queenston Street	0.267	100	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	RSS	NOW

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
2065	Clarence Street	Queenston Street	Front Street South	0.089	100	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2075	York Street	Niagara River Parkway	Front Street South	0.288	200	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	REC	NOW
2085	Queenston Street	Niagara River Parkway	Dee Road	0.353	400	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
2090	Queenston Street	Dee Road	Walnut Street	0.025	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2095	Queenston Street	Walnut Street	Highlander Street	0.188	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
210	Line 2 Road	Hope Avenue	Annmarie Drive	0.100	1,700	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2100	Queenston Street	Highlander Street	Dumfries Street	0.089	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2105	Queenston Street	Dumfries Street	Partition Street	0.092	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2110	Queenston Street	Partition Street	Kent Street	0.088	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2115	Queenston Street	Kent Street	Clarence Street	0.088	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2120	Princess Street	Walnut Street	North End Cul De Sac	0.146	50	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2125	Princess Street	Walnut Street	Maple Street	0.086	150	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2130	Princess Street	Maple Street (North)	Highlander Street	0.104	150	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2135	Princess Street	Highlander Street	Dumfries Street	0.089	150	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2140	Princess Street	Dumfries Street	Partition Street	0.095	238	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2145	Queenston Street	Partition Street	Kent Street	0.087	180	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
215	Line 2 Road	Annmarie Drive	Concession 4 Road	0.196	1,761	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
2150	Front Street	Kent Street	Clarence Street	0.091	120	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
2155	Front Street	Clarence Street	York Street	0.049	120	ADEQ	1-5	ADEQ	6-10	ADEQ	ADEQ	RSS	1-5
2160	Maple Street	Princess Street	Front Street South	0.063	30	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	RSS	ADEQ
220	Line 2 Road	Concession 4 Road	Concession 3 Road	1.066	1,438	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R2	6-10
225	Line 2 Road	Concession 3 Road	Concession 2 Road	1.047	830	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
230	Line 2 Road	Concession 2 Road	Concession 1 Road	1.115	269	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
235	Line 2 Road	Concession 1 Road	Niagara River Parkway	0.986	261	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
240	Line 3 Road	Townline Road	Concession 7 Road	1.043	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
24118	Steele Road	0.35km West of Four Mile Creek Road	End	0.273	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
24230	Stewart Road	Lakeshore Road	End	0.815	10	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
24264	Palatine Place	Circle Street	End	0.074	20	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	SD	ADEQ
24272	Annmarie Drive	Diana Drive	Paradise Grove	0.118	120	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
24294	Annmarie Drive	0.048 km North of Raiana Drive	Paradise Grove	0.048	90	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
24335	Rampart Street	Moseby Street	Perez Street	0.083	83	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
24411	Front Street South	Maple Street	Highlander Street	0.103	20	ADEQ	6-10	ADEQ	6-10	NOW	ADEQ	RSS	ADEQ
245	Line 3 Road	Concession 7 Road	0.1km West of 55- Niagara Stone Road	0.704	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
25	East and West Line	Regional Road 100 - Four Mile Creek Road	0.4km East of 100- Four Mile Creek Road	0.400	8,187	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
250	Line 3 Road	0.1km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	0.100	250	ADEQ	6-10	NOW	NOW	ADEQ	ADEQ	PR2	NOW
255	Line 3 Road	Concession 6 Road	West End Cul De Sac	0.083	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
25663	Nelson Street	Ricardo Street	End	0.061	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
25771	Mulberry Lane	Niagara Stone Road	Copper Beach Boulevard	0.075	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
25773	Mulberry Lane	Copper Beach Boulevard	End	0.077	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
25775	Copper Beech Boulevard	Mulberry Lane	Pierpoint Drive	0.141	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
260	Line 3 Road	Concession 6 Road	Regional Road 100 - Four Mile Creek Road	1.542	1,379	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
26309	Counsell Street	Regional Road 81- York Road	North End Cul De Sac	0.179	145	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
265	Line 3 Road	Regional Road 100 - Four Mile Creek Road	Concession 4 Road	0.489	1,831	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
270	Line 3 Road	Concession 4 Road	Concession 3 Road	1.069	706	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R2	6-10
27369	Lampman Court	89- Glendale Avenue	East End Cul de sac	0.385	1,200	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
27449	Tulip Tree Road	Turlip Tree Road	Hickory Avenue	0.094	95	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
275	Line 3 Road	Concession 3 Road	Concession 2 Road	1.041	706	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R2	6-10
280	Line 3 Road	Concession 2 Road	Concession 1 Road	1.114	928	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST+	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
285	Line 3 Road	Concession 1 Road	Niagara River Parkway	0.799	815	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28613	Eastchester Avenue	West End	House 153	0.058	50	ADEQ	6-10	ADEQ	NOW	NOW	NOW	NONE	NOW
28876	Pierpoint Drive	Copper Beach Boulevard	End	0.054	55	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28877	Pierpoint Drive	Copper Beach Boulevard	Gossen Drive	0.113	115	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28878	Pierpoint Drive	Gossen Drive	Summerhayes Drive	0.081	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28879	Pierpoint Drive	Summerhayes Drive	Line 2 Road	0.112	115	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28880	Gossen Drive	Pierpoint Drive	End	0.091	90	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28881	Summerhayes Drive	Pierpoint Drive	End	0.092	90	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28967	Hickory Avenue	West End	Kenmir Avenue	0.189	180	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28969	Kenmir Avenue	Hickory Avenue	End	0.014	1	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
28999	Angela Crescent	Cannery Drive	Concession 3 Road	0.086	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
290	Line 4 Road	Concession 7 Road	0.1km East of Concession 7 Road	0.101	140	ADEQ	6-10	NOW	NOW	ADEQ	ADEQ	BS	NOW
29000	Angela Crescent	Cannery Drive	Chiara Way	0.111	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29001	Angela Crescent	Chiara Way	Cannery Drive	0.357	360	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29003	Cannery Drive	Angela Crescent	Angela Crescent	0.089	570	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29004	Cannery Drive	Angela Crescent	Dominion Crescent	0.080	570	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29005	Cannery Drive	Dominion Crescent	Dominion Crescent	0.163	570	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29006	Cannery Drive	Dominion Crescent	Concession 3 Road	0.254	570	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29007	Dominion Crescent	Cannery Drive	Cannery Drive	0.302	302	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29009	Chiara Way	Line 9 Road	Angela Crescent	0.081	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29096	Perez Road	Rampart Street	Garrison Village Drive	0.120	120	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29097	Perez Road	Rampart Street	Niven Road	0.095	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29112	Brock Street	Macdonell Road	Murray Street	0.060	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29113	Brock Street	Macdonell Road	Cooley Lane	0.109	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
29114	Macdonell Road	Cooley Lane	Murray Street	0.146	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29115	Brock Street	25m North of Cooley Crescent	Cooley Lane	0.025	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29116	Macdonell Road	Brock Street	Cooley Lane	0.041	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
295	Line 4 Road	0.1km East of Concession 7 Road	Concession 6 Road	0.884	140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
29771	Kenmir Avenue	Hickory Avenue	Kenmir Avenue	0.306	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30	East and West Line	0.4km East of 100- Four Mile Creek Road	Concession 4 Road	0.638	3,250	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
300	Line 4 Road	1.0km West of 100- Four Mile Creek Road	Regional Road 100 - Four Mile Creek Road	1.080	140	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
30034	Rampart Street	Colonel Cohoe Street	Moseby Street	0.073	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30035	Moseby Street	Rampart Street	Niven Road	0.095	95	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3005	Homestead Drive	Line 1 Road	Harvest Drive	0.097	785	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30052	Shaws Lane	Simcoe Street	37m North of Albion (Private Rd)	0.262	135	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30072	Paradise Grove	Annmarie Drive	Concession 4 Road	0.191	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30073	Paradise Grove	Annmarie Drive	Paradise Grove	0.086	90	ADEQ	1-5	ADEQ	ADEQ	ADEQ	ADEQ	NONE	1-5
30074	Paradise Grove	Paradise Grove	End	0.058	60	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30088	Anne Street	Anne Street	End	0.062	20	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3010	Homestead Drive	Harvest Drive	Plantation Drive	0.104	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30110	Woodbourne Court	South End Cul De Sac	Warner Road	0.081	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3015	Homestead Drive	Plantation Drive	Grange Crescent	0.094	308	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30191	Millpond Road	Line 9 Road	Willow Lane	0.082	260	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30192	Millpond Road	Willow Lane	Mills Lane	0.181	180	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30193	Millpond Road	Millpond Road	Four Mile Creek Road	0.171	171	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3020	Homestead Drive	Grange Crescent	Frontier Drive	0.072	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3025	Homestead Drive	Frontier Drive	West End Cul De Sac	0.050	40	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30295	Cottage Street	Shaw's Lane	King Street	0.170	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
3030	Frontier Drive	Homestead Drive	Cherry Street	0.120	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
30311	Kenmir Avenue	Highland Lane	Tanbark Road	0.235	235	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3035	Frontier Drive	Cherry Street	Hearth Court	0.156	400	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
3040	Frontier Drive	Hearth Court	Bordeaux Drive	0.113	451	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3045	Bordeaux Drive	Frontier Drive	Line 2 Road	0.221	783	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
305	Line 4 Road	Regional Road 100 - Four Mile Creek Road	0.1km East of 100- Four Mile Creek Road	0.101	300	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
3050	Hearth Court	Frontier Drive	South End Cul De Sac	0.161	100	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
3055	Plantation Drive	Homestead Drive	129m West of Homestead Drive	0.129	60	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	SR	NOW
3060	Harvest Drive	Homestead Drive	0.1 km West of Homestead	0.100	60	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SR	6-10
3065	Grange Crescent	Homestead Drive	Autumn Place	0.294	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3070	Autumn Place	Grange Crescent	South End Cul De Sac	0.106	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3075	Grange Crescent	Autumn Place	Homestead Drive	0.087	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3080	Henry Street	Line 1 Road	Pine Street	0.153	1,031	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
3085	Henry Street	Pine Street	Cherry Street	0.316	413	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
3090	Henry Street	Cherry Street	Andres Street	0.265	800	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
3095	Pine Street	Henry Street	East End	0.109	100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
310	Line 4 Road	0.1km East of 100- Four Mile Creek Road	Concession 3 Road	0.959	300	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
3100	Cherry Street	Frontier Drive	Andres Street	0.097	500	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
3105	Cherry Street	Andres Street	Henry Street	0.105	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3110	Andres Street	Cherry Street	Henry Street	0.182	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
31122	Oakley Drive	Homestead Drive	Line 1 Road	0.375	375	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
31123	Homestead Drive	Oakley Drive	Dead End	0.040	40	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
31124	Homestead Drive	Concession 6 Road	Oakley Drive	0.290	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3115	Andres Street	Henry Street	Line 2 Road	0.201	847	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3120	Henegan Road	Regional Road 55 - Niagara Stone Road	Walker Road	0.318	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3125	Walker Road	Henegan Road	West End Cul De Sac	0.273	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3130	Walker Road	Henegan Road	East End	0.102	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3135	Elden Street	Field Road	Penner Street	0.166	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3140	Elden Street	Penner Street	North End Cul De Sac	0.171	200	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	R2	NOW
3145	Field Road	Regional Road 100 - Four Mile Creek Road	Elden Street	0.197	449	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
315	Line 4 Road	Concession 3 Road	Concession 2 Road	1.041	300	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
3150	Field Road	Elden Street	Regional Road 55 - Niagara Stone Road	0.104	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3155	Lorraine Street	Regional Road 100 - Four Mile Creek Road	East End Cul de sac	0.340	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3160	Hope Avenue	Line 2 Road	Raiana Drive	0.174	457	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3165	Annmarie Drive	Line 2 Road	Raiana Drive	0.174	210	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
3170	Annmarie Drive	Raiana Drive	North End	0.039	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3175	Raiana Drive	Annmarie Drive	Hope Avenue	0.099	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
3180	Raiana Drive	Hope Avenue	South End Cul De Sac	0.195	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3185	Diana Drive	Concession 4 Road	Bianca Drive	0.128	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3190	Diana Drive	Bianca Drive	Annmarie Drive	0.048	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3195	Diana Drive	Annmarie Drive	North End Cul De Sac	0.166	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
320	Larkin Road	Concession 2 Road	Concession 1 Road	1.113	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3205	Bianca Drive	Diana Drive	Loretta Drive	0.179	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
3210	Bianca Drive	Loretta Drive	Loretta Drive	0.171	1,000	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
3215	Loretta Drive	Bianca Drive	Fisher Drive	0.286	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
3220	Loretta Drive	Fisher Drive	Fisher Drive	0.537	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3225	Loretta Drive	Fisher Drive	Casselman Boulevard	0.102	1,000	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3230	Loretta Drive	Casselman Boulevard	Bianca Drive	0.086	700	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
3235	Loretta Drive	Bianca Drive	Concession 4 Road	0.114	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3240	Fisher Drive	Loretta Drive	Loretta Drive	0.230	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
3245	Casselman Boulevard	Loretta Drive	Line 1 Road	0.128	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
325	Line 5 Road	Concession 7 Road	Concession 6 Road	0.940	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
330	Line 5 Road	Concession 6 Road	Concession 5 Road	0.970	502	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SST++	6-10
335	Line 5 Road	Regional Road 100 - Four Mile Creek Road	Concession 5 Road	1.188	500	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5
340	Line 5 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	0.972	350	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	DSTreha	NOW
345	Line 5 Road	Concession 3 Road	Concession 2 Road	1.024	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
35	East and West Line	Concession 4 Road	Regional Road 55 - Niagara Stone Road	0.384	3,720	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
350	Line 5 Road	Concession 2 Road	Concession 1 Road	1.113	350	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5
355	Browns Point Circle	Niagara River Parkway	West End Cul De Sac	0.221	50	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	R2	NOW
360	Welland Avenue	Regional Road 88 - Stewart Road	East End	0.200	30	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
365	Line 6 Road	Concession 7 Road	Concession 6 Road	0.922	250	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5
370	Line 6 Road	Concession 6 Road	Concession 5 Road	0.974	500	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5
375	Line 6 Road	Concession 5 Road	Regional Road 100 - Four Mile Creek Road	1.337	500	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
380	Line 6 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	0.823	450	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
385	Line 6 Road	Concession 3 Road	Concession 2 Road	1.039	450	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
390	Line 6 Road	Concession 2 Road	Concession 1 Road	1.096	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
395	Line 6 Road	Concession 1 Road	Niagara River Parkway	1.018	257	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
398	Eastchester Avenue	House 153	House 165 Entrance	0.092	20	ADEQ	6-10	ADEQ	NOW	ADEQ	NOW	BS	ADEQ
40	East and West Line	Regional Road 55 - Niagara Stone Road	Concession 3 Road	0.692	2,586	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
400	Eastchester Avenue	House 165 Entrance	Regional Road 88 - Stewart Road	0.078	30	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	ADEQ
4005	Turntable Way	Wellington Street	West End	0.045	50	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4010	Riverbeach Drive	Wellington Street	Melville Street	0.114	200	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4015	Lockhart Street	Turntable Road	Melville Street	0.103	200	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
4020	Delater Street	King Street	Ball Street	0.246	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4025	Delater Street	Ball Street	Turntable Road	0.060	640	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4030	Delater Street	Turntable Road	Melville Street	0.102	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4035	Front Street	Simcoe Street	Gate Street	0.145	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4040	Front Street	Gate Street	Victoria Street	0.149	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4045	Front Street	Victoria Street	Regent Street	0.148	2,100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
405	Eastchester Avenue	Stewart Road	0.06km West of 55- Niagara Stone Road	0.869	175	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4050	Front Street	Regent Street	King Street	0.150	1,200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4055	Ricardo Street	King Street	Ball Street	0.245	436	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4060	Ricardo Street	Ball Street	Wellington Street	0.064	1,700	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4065	Ricardo Street	Wellington Street	Melville Street	0.100	1,700	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4070	Ricardo Street	Melville Street	0.12km East of Melville Street	0.120	1,700	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4075	Ricardo Street	0.12km East of Melville Street	Nelson Street	0.093	1,700	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4080	Ricardo Street	Nelson Street	Collingwood Street	0.161	1,700	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4085	Ricardo Street	Collingwood Street	0.12km East of Collingwood Street	0.117	1,175	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4090	Prideaux Street	Simcoe Street	Gate Street	0.148	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4095	Prideaux Street	Gate Street	Victoria Street	0.150	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
410	Eastchester Avenue	0.06km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	0.060	175	ADEQ	6-10	NOW	NOW	ADEQ	ADEQ	BS	NOW
4100	Prideaux Street	Victoria Street	Regent Street	0.147	430	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4105	Prideaux Street	Regent Street	King Street	0.150	817	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4110	Byron Street	King Street	Wellington Street	0.309	1,198	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4115	Byron Street	Wellington Street	Melville Street	0.102	650	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4120	Byron Street	Melville Street	Nelson Street	0.214	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
4125	Byron Street	Nelson Street	East End	0.106	100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4130	Queen Street	Palatine Place	Newark Street	0.199	1,147	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4135	Queen Street	Newark Street	Nassau Street	0.149	1,100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4140	Queen Street	Nassau Street	Dorchester Street	0.146	926	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4145	Queen Street	Dorchester Street	Butler Street	0.156	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
415	Line 7 Road	Concession 7 Road	0.9km West of Concession 7 Road	0.891	20	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
4150	Queen Street	Butler Street	Mississagua Street	0.153	1,781	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4155	Queen Street	Mississagua Street	Simcoe Street	0.153	4,007	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4160	Queen Street	Simcoe Street	Gate Street	0.148	4,056	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4165	Queen Street	Gate Street	Victoria Street	0.150	6,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4170	Queen Street	Victoria Street	Regent Street	0.147	6,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4175	Queen Street	Regent Street	King Street	0.152	8,000	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4180	Picton Street	King Street	Davy Street	0.156	1,859	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4185	Picton Street	Davy Street	Wellington Street	0.152	5,740	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4190	Queen's Parade	Wellington Street	150m East of Wellington Ave	0.150	6,890	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4195	Queen's Parade	0.15km East of Wellington Street	0.40km East of Wellington Street	0.250	6,890	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
420	Line 7 Road	Concession 7 Road	Concession 6 Road	0.900	100	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
4200	Queen's Parade	0.40km East of Wellington Street	John Street	0.993	6,890	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
4205	Johnson Street	Niagara Boulevard	Palatine Place	0.062	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
4210	Johnson Street	Palatine Place	Newark Street	0.147	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4215	Johnson Street	Newark Street	Nassau Street	0.147	329	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4220	Johnson Street	Nassau Street	Dorchester Street	0.146	333	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4225	Johnson Street	Dorchester Street	Butler Street	0.154	525	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4230	Johnson Street	Butler Street	Mississagua Street	0.154	525	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4235	Johnson Street	Mississagua Street	Simcoe Street	0.153	1,500	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4240	Johnson Street	Simcoe Street	Gate Street	0.150	870	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4245	Johnson Street	Gate Street	Victoria Street	0.148	950	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
425	Line 7 Road	Concession 6 Road	Concession 5 Road	0.992	322	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4250	Johnson Street	Victoria Street	Regent Street	0.148	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4255	Johnson Street	Regent Street	King Street	0.150	3,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4260	Platoff Street	King Street	Davy Street	0.158	800	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
4265	Platoff Street	Wellington Street	Davy Street	0.153	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4270	Market Street	Regent Street	East End	0.046	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4275	Market Street	King Street	West End	0.057	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4280	Lakeview Street	Niagara Boulevard	Orchard Drive	0.093	50	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4283	Gage Street	Palatine Place	Nassau Street	0.293	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4285	Gage Street	Dorchester Street	0.1km West of Dorchester Street	0.091	40	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
4290	Gage Street	Dorchester Street	Butler Street	0.154	150	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4295	Gage Street	Butler Street	Mississagua Street	0.155	160	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
430	Line 7 Road	Concession 5 Road	Regional Road 100 - Four Mile Creek Road	1.477	350	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4300	Gage Street	Mississagua Street	Simcoe Street	0.153	160	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4305	Gage Street	Simcoe Street	Gate Street	0.150	200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4310	Gage Street	Gate Street	Victoria Street	0.146	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
4315	Gage Street	Victoria Street	Regent Street	0.150	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4320	Gage Street	Regent Street	King Street	0.147	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4325	Castlereagh Street	King Street	Davy Street	0.157	500	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4330	Castlereagh Street	Davy Street	Wellington Street	0.142	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4335	Lansdowne Avenue	Niagara Boulevard	Orchard Drive	0.121	100	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	RSS	NOW

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
4340	Lansdowne Avenue	Orchard Drive	Palatine Place	0.135	100	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
4345	Hampton Court	Nassau Street	West End Cul De Sac	0.149	70	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
435	Line 7 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	0.671	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
4350	Nelles Street	King Street	Davy Street	0.156	200	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
4355	Centre Street	Dorchester Street	Butler Street	0.153	150	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	6-10
4360	Centre Street	Butler Street	Mississagua Street	0.155	143	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4365	Centre Street	Mississagua Street	Simcoe Street	0.153	210	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
4370	Centre Street	Simcoe Street	Gate Street	0.149	320	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4375	Centre Street	Gate Street	Victoria Street	0.147	320	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4380	Centre Street	Victoria Street	Regent Street	0.148	320	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4385	Centre Street	Regent Street	King Street	0.149	317	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4390	William Street	Chautauqua Amphitheatre	Nassau Street	0.277	428	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4395	William Street	Nassau Street	Dorchester Street	0.149	483	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
440	Line 7 Road	Concession 3 Road	Concession 2 Road	1.050	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
4400	William Street	Dorchester Street	Butler Street	0.155	426	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
4405	William Street	Butler Street	Mississagua Street	0.154	486	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4410	William Street	Mississagua Street	Simcoe Street	0.154	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4415	William Street	Simcoe Street	Gate Street	0.145	200	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4420	William Street	Gate Street	Victoria Street	0.148	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4425	William Street	Victoria Street	Regent Street	0.149	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4430	Mary Street	Nassau Street	87- Mary Street	0.127	3,432	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4435	Mary Street	Mississagua Street	Simcoe Street	0.154	3,650	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4440	Mary Street	Simcoe Street	Gate Street	0.143	3,800	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4445	Mary Street	Gate Street	Victoria Street	0.150	3,800	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
445	Line 7 Road	Concession 2 Road	Concession 1 Road	1.085	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
4450	Mary Street	Victoria Street	Regent Street	0.148	3,800	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RM	NOW
4455	Mary Street	Regent Street	King Street	0.150	3,800	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4460	John Street West	Dorchester Street	Butler Street	0.147	338	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4465	John Street West	Butler Street	55- Mississauga Street	0.156	200	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4470	John Street West	55- Mississauga Street	Simcoe Street	0.151	1,488	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4475	John Street West	Simcoe Street	Gate Street	0.144	1,445	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4480	John Street West	Gate Street	Victoria Street	0.149	1,800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4485	John Street West	Victoria Street	Regent Street	0.149	1,800	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4490	John Street West	Regent Street	King Street	0.150	1,800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4495	John Street East	King Street	Park Court	0.137	1,200	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
45	East and West Line	Concession 3 Road	Concession 2 Road	1.048	2,586	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
450	Cross Street	Regional Road 88 - Stewart Road	East End Cul de sac	0.323	50	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	REC	NOW
4500	John Street East	Park Court	Park Court	0.094	1,200	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4505	John Street East	Park Court	Charlotte Street	0.131	1,200	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4510	John Street East	Charlotte Street	Niagara River Parkway	1.132	672	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4515	Anne Street	55- Mississauga Street	Start of Culdesac	0.081	30	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4520	Anne Street	55- Mississauga Street	Simcoe Street	0.149	750	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4525	Anne Street	Simcoe Street	Gate Street	0.148	650	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4530	Anne Street	Gate Street	Victoria Street	0.148	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4535	Anne Street	Victoria Street	88m East of Victoria St.	0.088	600	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4540	Anne Street	88m East of Victoria St.	King Street	0.210	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4545	Christopher Street	Charlotte Street	East End Cul de sac	0.114	100	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
455	Lincoln Avenue	Regional Road 90- Airport Road	East End	0.877	250	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
4550	Weatherstone Court	Charlotte Street	East End Cul de sac	0.179	100	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4551	Shaw's Lane	37m North of Albion (Private Rd)	King St	0.203	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4555	Paffard Street	King Street	Rye Street	0.080	249	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4560	Paffard Street	Rye Street	Charlotte Street	0.292	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4565	James Street	Charlotte Street	West End	0.219	150	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4570	Flynn Street	Rye Street	Green Street	0.266	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4575	Flynn Street	Green Street	Charlotte Street	0.143	80	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4580	Niagara Street	Rye Street	Green Street	0.279	918	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4585	Niagara Street	Green Street	Charlotte Street	0.151	2,000	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	RW	ADEQ
4590	Niagara Street	Charlotte Street	0.13km South of Charlotte Street	0.139	3,079	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4595	Niagara Street	0.13km South of Charlotte Street	East and West Line	0.317	2,098	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
460	Line 8 Road	Concession 7 Road	0.3km West of Concession 7 Road	0.300	10	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4605	Melville Street	Byron Street	Ricardo Street	0.149	800	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4610	Melville Street	Ricardo Street	Delater Street	0.070	650	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4615	Melville Street	Delater Street	Lockhart Street	0.070	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
462	Line 8 Road	Concession 7 Road	0.3km East of Concession 7 Road	0.303	20	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	DSTreha	ADEQ
4620	Melville Street	Lockhart Street	Riverbeach Drive	0.063	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4625	Harmony Drive	Charlotte Street	Lucia Court	0.277	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
463	Line 8 Road	Concession 6 Road	0.55km East of Concession 6 Road	0.550	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4630	Harmony Drive	Lucia Court	East End Cul de sac	0.204	140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4635	Lucia Court	Harmony Drive	North End Cul De Sac	0.169	140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4640	The Promenade	Charlotte Street	Coach Drive (South)	0.093	400	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4645	The Promenade	Coach Drive (South)	Coach Drive (North)	0.535	400	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
465	Line 8 Road	Concession 5 Road	0.1km West of Concession 5 Road	0.100	10	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	BS	ADEQ
4650	The Promenade	Coach Drive (North)	Charlotte Street	0.193	400	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4655	Coach Drive	The Promenade (South)	Settlers Court	0.171	200	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4660	Coach Drive	Settlers Court	The Promenade (North)	0.129	200	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4665	Settlers Court	Coach Drive	South End Cul De Sac	0.180	100	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
4670	Charlotte Street	Niagara Street	Harmony Drive	0.105	1,200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4672	Charlotte Street	Campbell Street	Harmony Drive	0.053	1,200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4673	Campbell Street	Charlotte Street	Green Street	0.142	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4675	Charlotte Street	Harmony Drive	The Promenade (South)	0.157	1,250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4680	Charlotte Street	The Promenade (South)	Flynn Street	0.150	1,250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4685	Charlotte Street	Flynn Street	James Street	0.123	1,250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4690	Charlotte Street	James Street	The Promenade (North)	0.075	1,005	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4695	Charlotte Street	The Promenade (North)	Paffard Street	0.138	1,335	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
470	Line 8 Road	Tanbark Road	0.2km West of Tanbark Road	0.200	70	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST++	ADEQ
4700	Charlotte Street	Paffard Street	Weatherstone Court	0.021	1,300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4705	Charlotte Street	Weatherstone Court	Christopher Street	0.103	1,250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4710	Charlotte Street	Christopher Street	John Street East	0.180	1,131	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4715	Wellington Street	Castlereagh Street	Platoff Street	0.150	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4720	Wellington Street	Platoff Street	Queens Parade- Picton	0.154	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4725	Wellington Street	Queens Parade- Picton	Byron Street	0.152	1,000	ADEQ	1-5	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4730	Wellington Street	Byron Street	Ricardo Street	0.148	1,000	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	SD	1-5
4735	Turntable Road	Delater Street	Lockhart Street	0.067	100	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4740	Turntable Road	Lockhart Street	Riverbeach Drive	0.043	100	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
4745	Green Street	Niagara Street	Flynn Street	0.389	150	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
475	Line 8 Road	Tanbark Road	Regional Road 100 - Four Mile Creek Road	0.563	125	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
4750	Park Court	John Street East	John Street East	0.331	220	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4755	Rye Street	Niagara Street	Cottage Street	0.213	1,232	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4760	Rye Street	Cottage Street	Flynn Street	0.113	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4765	Rye Street	Flynn Street	Paffard Street	0.204	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4770	Cottage Street	King Street	Rye Street	0.083	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4775	Davy Street	Nelles Street	Castlereagh Street	0.077	100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4780	Davy Street	Castlereagh Street	Platoff Street	0.145	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4785	Davy Street	Platoff Street	Queens Parade- Picton	0.153	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
4790	Ball Street	Ricardo Street	Delater Street	0.071	80	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	SD	NOW
4795	Ball Street	Delater Street	North End	0.051	20	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RSS	ADEQ
480	Line 8 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	0.499	725	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
4800	King Street	Cottage Street	South End	0.162	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4805	King Street	Cottage Street	Paffard Street	0.295	1,636	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4810	King Street	Paffard Street	Anne Street	0.147	1,700	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4815	King Street	Anne Street	John Street	0.150	1,954	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4820	King Street	John Street	Mary Street	0.154	2,000	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4825	King Street	Mary Street	Centre Street	0.311	3,398	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4830	King Street	Centre Street	Nelles Street	0.070	4,216	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4835	King Street	Nelles Street	Gage Street	0.079	3,000	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4840	King Street	Gage Street	Johnson Street	0.147	4,000	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
4845	King Street	Johnson Street	Queen Street	0.154	3,783	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
485	Line 8 Road	Concession 3 Road	Concession 2 Road	1.064	725	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
4850	King Street	Queen Street	Byron Street	0.153	2,538	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4855	King Street	Byron Street	Ricardo Street	0.150	1,758	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4860	King Street	Ricardo Street	Delater Street	0.065	600	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4865	Regent Street	0.05km South of John Street West	John Street West	0.045	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4870	Regent Street	John Street West	Mary Street	0.153	250	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4875	Regent Street	Mary Street	William Street	0.156	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4880	Regent Street	William Street	Centre Street	0.156	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4885	Regent Street	Centre Street	Gage Street	0.148	516	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
4890	Regent Street	Gage Street	Johnson Street	0.148	750	ADEQ	1-5	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
4895	Regent Street	Johnson Street	Queen Street	0.155	745	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
490	Line 8 Road	Concession 2 Road	Concession 1 Road	1.071	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4900	Regent Street	Queen Street	Prideaux Street	0.152	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4905	Regent Street	Prideaux Street	Front Street	0.150	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4910	Victoria Street	Simcoe Street	Anne Street	0.379	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
4915	Victoria Street	Anne Street	John Street West	0.149	299	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	ADEQ
4920	Victoria Street	John Street West	Mary Street	0.153	250	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4925	Victoria Street	Mary Street	William Street	0.156	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
4930	Victoria Street	William Street	Centre Street	0.155	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
4935	Victoria Street	Centre Street	Gage Street	0.147	500	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4940	Victoria Street	Gage Street	Johnson Street	0.148	500	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
4945	Victoria Street	Johnson Street	Queen Street	0.154	354	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
495	Line 8 Road	Concession 1 Road	Niagara River Parkway	0.908	340	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTrehal	1-5
4950	Victoria Street	Queen Street	Prideaux Street	0.154	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4955	Victoria Street	Prideaux Street	Front Street	0.149	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
4960	Karsam Court	Simcoe Street	North End Cul De Sac	0.170	150	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
4965	Gate Street	Anne Street	John Street East	0.147	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
4970	Gate Street	John Street	Mary Street	0.153	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4975	Gate Street	Mary Street	William Street	0.158	350	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	SD	NOW
4980	Gate Street	William Street	Centre Street	0.153	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
4985	Gate Street	Centre Street	Gage Street	0.147	400	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4990	Gate Street	Gage Street	Johnson Street	0.149	435	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
4995	Gate Street	Johnson Street	Queen Street	0.155	656	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5	East and West Line	87- Lakeshore Road	Townline Road	0.253	3,250	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
50	East and West Line	Concession 2 Road	Niagara Street	0.451	3,350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
500	Arnold Road	Concession 2 Road	0.05km East of Concession 2 Road	0.050	10	ADEQ	ADEQ	ADEQ	ADEQ	NOW	ADEQ	BS	ADEQ
5000	Gate Street	Queen Street	Prideaux Street	0.154	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5005	Gate Street	Prideaux Street	Front Street	0.148	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5010	Simcoe Street	South End	Victoria Street	0.065	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5015	Simcoe Street	Victoria Street	Karsam Court	0.114	120	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5020	Simcoe Street	Karsam Court	Anderson Lane	0.145	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5025	Simcoe Street	Anderson Lane	Anne Street	0.234	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5030	Simcoe Street	Anne Street	John Street West	0.147	39	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5035	Simcoe Street	John Street West	Mary Street	0.154	314	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
5040	Simcoe Street	Mary Street	William Street	0.160	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5045	Simcoe Street	William Street	Centre Street	0.152	400	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
505	Arnold Road	Concession 1 Road	0.5km West of Concession 1 Road	0.500	30	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
5050	Simcoe Street	Centre Street	Gage Street	0.146	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5055	Simcoe Street	Gage Street	Johnson Street	0.146	450	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5060	Simcoe Street	Johnson Street	Queen Street	0.156	233	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
5065	Simcoe Street	Queen Street	Prideaux Street	0.155	800	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
5070	Simcoe Street	Prideaux Street	Front Street	0.144	600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
5075	Anderson Lane	55- Mississauga Street	Simcoe Street	0.259	1,000	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5080	Mississagua Street	87- Mary Street	William Street	0.162	5,016	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
5085	Mississagua Street	William Street	Centre Street	0.148	3,169	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
5090	Mississagua Street	Centre Street	Gage Street	0.148	8,213	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
5095	Mississagua Street	Gage Street	Johnson Street	0.148	6,500	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
510	Martin Road	Queenston Road	Townline Road	0.733	150	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	BS	NOW
5100	Mississagua Street	Johnson Street	Queen Street	0.154	6,500	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
5105	Butler Street	0.1km South of John Street West	John Street West	0.101	100	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RNS	6-10
5110	Butler Street	John Street West	Mary Street	0.160	150	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5115	Butler Street	Mary Street	William Street	0.156	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
512	Line 9 Road	West End Cul De Sac	Tanbark Road	0.514	30	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	ADEQ
5120	Butler Street	William Street	Centre Street	0.149	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5125	Butler Street	Centre Street	Gage Street	0.148	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5130	Butler Street	Johnson Street	South End	0.053	30	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5135	Butler Street	Johnson Street	Queen Street	0.152	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
5140	Dorchester Street	John Street West	Mary Street	0.162	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
5145	Dorchester Street	Mary Street	William Street	0.158	546	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
515	Line 9 Road	Regional Road 100 - Four Mile Creek Road	0.1km West of 100- Four Mile Creek Road	0.101	5	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5150	Dorchester Street	William Street	Centre Street	0.148	636	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
5155	Dorchester Street	Centre Street	Gage Street	0.148	400	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	RSS	1-5
5160	Dorchester Street	Gate Street	Johnson Street	0.150	300	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	RSS	6-10
5165	Dorchester Street	Johnson Street	Queen Street	0.152	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	R2	6-10
5170	Nassau Street	87- Lakeshore Road	William Street	0.230	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
5175	Nassau Street	William Street	0.1km North of William Street	0.101	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5180	Nassau Street	0.1km North of William Street	Hampton Court	0.103	250	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5185	Nassau Street	Hampton Court	Johnson Street	0.243	250	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5190	Nassau Street	Johnson Street	Queen Street	0.152	100	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5195	Newark Street	Johnson Street	Raiana Drive	0.152	200	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
520	Line 9 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	0.340	150	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5200	Palatine Place	0.02km South of Landsdowne Avenue	Orchard Drive	0.177	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
5205	Palatine Place	Orchard Drive	Johnson Street	0.072	200	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
5210	Palatine Place	Johnson Street	Niagara Boulevard	0.065	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5215	Orchard Drive	Lansdowne Avenue	Lakeview Street	0.087	100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	CRKsd	6-10
5220	Orchard Drive	Lakeview Street	Palatine Place	0.111	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5225	Niagara Boulevard	Vincent Avenue	Wilberforce Avenue	0.124	875	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5230	Niagara Boulevard	Wilberforce Avenue	Lansdowne Avenue	0.187	875	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5235	Niagara Boulevard	Lansdowne Avenue	Lakeview Street	0.182	875	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5240	Niagara Boulevard	Lakeview Street	Johnson Street	0.098	875	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5245	Niagara Boulevard	Johnson Street	Palatine Place	0.089	875	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
525	Line 9 Road	Concession 3 Road	Concession 2 Road	1.066	300	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	DSTreha	1-5
5250	Shakespeare Avenue	87- Lakeshore Road	Addison Avenue	0.371	1,113	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5255	Shakespeare Avenue	Addison Avenue	Luther Avenue	0.084	650	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5260	Shakespeare Avenue	Luther Avenue	Wyckliffe Avenue	0.109	600	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5265	Shakespeare Avenue	Wyckliffe Avenue	Vincent Avenue	0.161	583	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5270	Oak Drive	87- Lakeshore Road	Chautauqua Amphitheatre	0.397	550	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5275	Dixie Avenue	87- Lakeshore Road	Chautauqua Amphitheatre	0.339	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
5280	Addison Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	0.170	100	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	RW	6-10
5285	Luther Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	0.196	80	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RW	NOW
5290	Wyckliffe Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	0.259	150	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RW	NOW
5295	Vincent Avenue	Chautauqua Amphitheatre	Niagara Boulevard	0.322	237	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RW	NOW
530	Line 9 Road	Concession 1 Road	Concession 2 Road	1.063	483	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
5300	Vincent Avenue	Niagara Boulevard	Shakespeare Avenue	0.074	583	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SRR	6-10
5305	Wilberforce Avenue	Chautauqua Amphitheatre	Niagara Boulevard	0.272	250	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RW	NOW
5310	Wesley Avenue	Chautauqua Amphitheatre	North End	0.144	100	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	RW	NOW
5315	Froebel Avenue	Chautauqua Amphitheatre	North End	0.059	20	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
5320	Chautauqua Amphitheatre	William Street	William Street	0.424	300	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
535	Queenston Road	Regional Road 55 - Niagara Stone Road	0.4km East of 55- Niagara Stone Road	0.400	1,916	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	REC	1-5
5370	Bay Berry Lane	87- Lakeshore Road	Bay Berry Lane (East)	0.108	350	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5375	Bay Berry Lane	Bay Berry Lane (North)	West End Cul De Sac	0.126	125	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5380	Bay Berry Lane	Bay Berry Lane (North)	East End Cul de sac	0.237	225	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5385	Village Drive, NOTL	Niven Road	Garrison Village Drive	0.078	1,600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5390	Garrison Village Drive	87- Lakeshore Road	Colonel Butler Crescent	0.065	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5395	Garrison Village Drive	Colonel Butler Crescent	Westgate Drive	0.152	1,500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
540	Queenston Road	0.4km East of 55- Niagara Stone Road	Coon Road	0.375	1,000	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
5400	Garrison Village Drive	Westgate Drive	Tottenham Court	0.078	1,200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5405	Garrison Village Drive	Tottenham Court	Upper Canada Drive	0.099	1,200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5410	Garrison Village Drive	Upper Canada Drive	Village Drive, NOTL	0.090	1,200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5415	Garrison Village Drive	Village Road	Lower Canada Drive	0.056	1,200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5420	Garrison Village Drive	Lower Canada Drive	Samuel Street	0.081	1,200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5421	Garrison Village Drive	Samuel Street	Elizabeth Street	0.042	600	ADEQ	ADEQ	ADEQ	ADEQ	NOW	ADEQ	NONE	NOW
5422	Garrison Village Drive	Elizabeth Street	Colonel Cohoe Street	0.110	1,200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
5425	Westgate Drive	Garrison Village Drive	West End	0.047	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5430	Sentry Circle	Garrison Village Drive	West End Cul De Sac	0.119	100	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5435	Lower Canada Drive	Garrison Village Drive	Confederation Drive (West)	0.121	700	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
5440	Lower Canada Drive	Confederation Drive (West)	Confederation Drive (East)	0.225	567	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
5445	Confederation Drive	Lower Canada Drive	Navy Hall Circle	0.116	400	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
545	Queenston Road	Coon Road	Regional Road 90- Airport Road	0.863	738	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
5450	Confederation Drive	Navy Hall Circle	Lower Canada Drive	0.528	550	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
5455	Confederation Drive	Lower Canada Drive	Upper Canada Drive	0.096	100	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5460	Upper Canada Drive	Garrison Village Drive	Southgate Circle	0.283	500	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5465	Upper Canada Drive	Southgate Circle	Confederation Drive	0.044	60	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5470	Upper Canada Drive	Confederation Drive	Colonel Butler Crescent	0.087	80	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
5475	Southgate Circle	Upper Canada Drive	North End Cul De Sac	0.121	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5480	Tottenham Court	Garrison Village Drive	East End Cul de sac	0.147	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5485	Northgate Circle	Colonel Butler Crescent	South End Cul De Sac	0.167	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5490	Loyalist Court	Colonel Butler Crescent	West End Cul De Sac	0.151	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5495	Colonel Butler Crescent	Garrison Village Drive	Northgate Circle	0.108	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
55	East and West Line	Niagara Street	Concession 1 Road	0.663	1,306	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
550	Queenston Road	Regional Road 90- Airport Road	Martin Road	0.188	997	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
5500	Colonel Butler Crescent	Northgate Circle	Loyalist Court	0.237	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5505	Colonel Butler Crescent	Loyalist Court	Upper Canada Drive	0.112	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5510	Colonel Butler Crescent	Upper Canada Drive	McFarland Gate	0.073	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5515	Colonel Butler Crescent	McFarland Gate	Laura Secord Place	0.117	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5520	Colonel Butler Crescent	Laura Secord Place	Merritt Circle	0.130	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5525	Colonel Butler Crescent	Merritt Circle	25m North of Cooley Crescent	0.067	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5530	Merritt Circle	Colonel Butler Crescent	East End Cul de sac	0.143	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5535	Laura Secord Place	Colonel Butler Crescent	East End Cul de sac	0.153	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5540	McFarland Gate	Colonel Butler Crescent	East End Cul de sac	0.158	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5545	Navy Hall Circle	Confederation Drive	East End Cul de sac	0.181	100	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	R2	1-5
555	Queenston Road	Martin Road	Townline Road	0.671	1,222	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
5550	Samuel Street	Niven Road	Garrison Village Drive	0.145	130	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5555	Elizabeth Street	Niven Road	Garrison Village Drive	0.178	170	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
5560	Colonel Cohoe Street	Niven Road	Garrison Village Drive	0.203	180	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
560	Queenston Road	Townline Road	0.5km East of Townline Road	0.500	1,314	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
565	Queenston Road	0.5km East of Townline Road	Concession 7 Road	0.546	876	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
570	Queenston Road	Concession 7 Road	Concession 6 Road	0.866	879	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
575	Queenston Road	Concession 6 Road	Concession 5 Road	1.031	1,114	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
580	Queenston Road	Concession 5 Road	Semi-Urban Section (St. David's)	0.941	837	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
585	Queenston Road	Semi-Urban Section (St. David's)	Regional Road 81- York Road	0.302	850	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
590	Melrose Drive	Regional Road 61- Townline (Stamford) Road	Mallette Crescent	0.331	550	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	BS	1-5
595	Melrose Drive	Mallette Crescent	Glenwood Crescent	0.371	300	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
60	East and West Line	Concession 1 Road	Niagara River Parkway	0.868	1,719	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
600	Melrose Drive	Glenwood Crescent	End	0.348	200	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	RSS	NOW
605	Mallette Crescent	Melrose Drive	End	0.255	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
610	Glenwood Crescent	Melrose Drive	North End	0.083	30	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	ADEQ
615	Concession 1 Road	Line 9 Road	Arnold Road	0.675	485	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
620	Concession 1 Road	Arnold Road	Line 8 Road (West)	0.165	485	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SST+	6-10
625	Concession 1 Road	Line 8 Road (West)	Line 7 Road	0.834	610	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
630	Concession 1 Road	Line 7 Road	Line 6 Road (East)	0.564	736	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
635	Concession 1 Road	Line 6 Road (East)	Line 6 Road (West)	0.275	735	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	BS	1-5
640	Concession 1 Road	Line 6 Road (West)	Line 5 Road	0.837	735	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
645	Concession 1 Road	Line 5 Road	Larkin Road	0.421	735	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SST++	6-10
65	Church Road	Read Road	86- Stewart Road	0.922	430	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
650	Concession 1 Road	Larkin Road	Line 4 Road	0.428	735	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
655	Concession 1 Road	Line 4 Road	Line 3 Road	0.830	739	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SD	ADEQ
660	Concession 1 Road	Line 3 Road	Line 2 Road	0.836	1,979	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
665	Concession 1 Road	Line 2 Road	Line 1 Road	0.838	1,800	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
670	Concession 1 Road	Line 1 Road	East and West Line	0.900	655	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	DSTrehal	6-10
675	Concession 2 Road	81- York Road	0.3km North of 81- York Road	0.300	1,582	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
680	Concession 2 Road	0.3km North of 81- York Road	Line 9 Road	0.605	2,257	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
685	Concession 2 Road	Line 9 Road	Arnold Road	0.672	1,592	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
690	Concession 2 Road	Arnold Road	Line 8 Road	0.157	1,592	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
695	Concession 2 Road	Line 8 Road	Line 7 Road	0.844	1,400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
70	Church Road	86- Stewart Road	McNab Road	0.928	615	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SD	6-10
700	Concession 2 Road	Line 7 Road	Line 6 Road	0.843	1,761	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
705	Concession 2 Road	Line 6 Road	Line 5 Road	0.835	1,340	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
710	Concession 2 Road	Line 5 Road	Larkin Road	0.420	1,340	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
715	Concession 2 Road	Larkin Road	Line 4 Road	0.437	1,340	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
720	Concession 2 Road	Line 4 Road	Line 3 Road	0.824	1,473	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
725	Concession 2 Road	Line 3 Road	Line 2 Road	0.829	1,572	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
730	Concession 2 Road	Line 2 Road	Line 1 Road	0.834	1,575	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
735	Concession 2 Road	Line 1 Road	East and West Line	0.915	2,255	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
740	Concession 3 Road	81- York Road	Line 9 Road	0.822	773	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
745	Concession 3 Road	Line 8 Road	0.3km North of Line 8 Road	0.300	35	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	BS	ADEQ
75	Church Road	McNab Road	Irvine Road	0.946	654	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
750	Concession 3 Road	Line 5 Road	0.2km North of Line 5 Road	0.200	10	ADEQ	6-10	ADEQ	ADEQ	NOW	ADEQ	BS	ADEQ
755	Concession 3 Road	Line 3 Road	0.5km North of Line 3 Road	0.533	30	ADEQ	ADEQ	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
760	Concession 3 Road	Line 1 Road	0.5km South of Line 1 Road	0.500	30	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
765	Tanbark Road	South End Cul De Sac	Warner Road	0.906	909	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
770	Tanbark Road	Warner Road	Regional Road 81- York Road	0.157	650	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
775	Tanbark Road	Regional Road 81- York Road	Stoneridge Crescent	0.241	250	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
780	Tanbark Road	Stoneridge Crescent	200m N of Stoneridge Crescent	0.200	456	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
782	Tanbark Road	200m N of Stoneridge Crescent	Line 9 Road	0.388	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
785	Concession 4 Road	Line 2 Road	Line 3 Road	0.825	1,303	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
790	Concession 4 Road	Line 2 Road	Diana Drive	0.365	543	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
795	Concession 4 Road	Diana Drive	Loretta Drive	0.349	1,366	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
80	Church Road	Irvine Road	Townline Road	0.919	752	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
800	Concession 4 Road	Loretta Drive	Line 1 Road	0.128	920	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
805	Concession 4 Road	Line 1 Road	Regional Road 55 - Niagara Stone Road	0.516	989	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
810	Concession 4 Road	Regional Road 55 - Niagara Stone Road	East and West Line	0.385	969	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
815	Concession 4 Road	East and West Line	Hunter Road	0.781	406	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
820	Concession 5 Road	Warner Road	Regional Road 81- York Road	0.426	140	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
825	Concession 5 Road	Queenston Road	0.2km North of Queenston Road	0.201	350	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	REC	NOW
830	Concession 5 Road	0.2km North of Queenston Road	Line 8 Road	0.705	350	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	DSTrehal	NOW
835	Concession 5 Road	Line 8 Road	Line 7 Road	0.837	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
840	Concession 5 Road	Line 7 Road	0.4km North of Line 7 Road	0.400	10	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
845	Concession 5 Road	Line 6 Road	Line 5 Road	0.854	80	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10

Critical Deficiencies

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ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
85	Line 1 Road	Townline Road	0.2km East of Townline Road	0.201	1,006	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
850	Concession 6 Road	Niagara Falls Boundary	Warner Road	0.365	2,300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
855	Concession 6 Road	Warner Road	Highway 405 Overpass	0.445	2,300	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
860	Concession 6 Road	Highway 405 Overpass	81- York Road	0.455	2,300	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
865	Concession 6 Road	Regional Road 81- York Road	Queenston Road	0.847	2,308	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
870	Concession 6 Road	Queenston Road	Line 8 Road	0.836	1,550	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	R1	6-10
875	Concession 6 Road	Line 8 Road	Line 7 Road	0.830	1,480	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
880	Concession 6 Road	Line 7 Road	Line 6 Road	0.836	1,471	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
885	Concession 6 Road	Line 6 Road	Line 5 Road	0.833	1,608	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
890	Concession 6 Road	Line 5 Road	Line 4 Road	0.839	1,600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
895	Concession 6 Road	Line 4 Road	0.1km South of Line 3 Road	0.736	1,600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
90	Line 1 Road	0.2km East of Townline Road	Concession 7 Road	0.839	851	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
900	Concession 6 Road	0.1km South of Line 3 Road	Line 3 Road	0.101	1,600	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9000	Young Crescent	Niagara-on-the-Green Blvd.	Niagara-on-the-Green Blvd.	0.411	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
9010	Wright Crescent	Young Crescent	Griffiths Gate	0.337	141	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
9020	Griffiths Gate	Wright Crescent	Glendale Avenue East	0.074	1,077	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9030	Wright Crescent	Griffiths Gate	Haynes Court	0.213	400	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
9040	Haynes Court	Haynes Court	North End	0.214	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
905	Concession 6 Road	Line 3 Road	Regional Road 55 - Niagara Stone Road	0.071	839	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9050	Wright Crescent	Haynes Court	Niagara-on-the-Green Boulevard	0.549	300	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	MICRO	ADEQ
9060	Street B	Homer Road	East End	0.235	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9070	Smallwood Crescent	Queenston Road	Paxton Lane	0.508	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	CRK	ADEQ
9080	Hickory Avenue	Tanbark Road	Dyck Lane (P)	0.312	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9088	Chestnut Avenue	Hickory Avenue	Bend	0.083	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
9090	Chestnut Avenue	Tulip Tree Road	Chestnut Avenue	0.193	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
910	Concession 6 Road	55- Mississauga Street	Cross Culvert	0.386	1,140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
912	Concession 6 Road	Cross Culvert	Line 2 Road	0.273	1,140	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
915	Concession 6 Road	Line 2 Road	Line 1 Road	0.840	650	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	R1	1-5
920	Concession 6 Road	Line 1 Road	East and West Line	0.879	600	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	BS	NOW
925	Wagg Road	East and West Line	North End Cul De Sac	0.902	50	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
930	Concession 7 Road	81- York Road	Queenston Road	0.868	1,573	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
935	Concession 7 Road	Queenston Road	Line 8 Road	0.810	1,000	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
940	Concession 7 Road	Line 8 Road	Line 7 Road	0.844	1,109	ADEQ	ADEQ	ADEQ	NOW	ADEQ	ADEQ	PR2	NOW
945	Concession 7 Road	Line 7 Road	Line 6 Road	0.845	1,441	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
95	Line 1 Road	Concession 7 Road	0.2km West of Concession 6 Road	0.804	1,000	ADEQ	6-10	ADEQ	1-5	ADEQ	ADEQ	DSTrehal	1-5
950	Concession 7 Road	Line 6 Road	Line 5 Road	0.842	1,450	ADEQ	6-10	ADEQ	6-10	ADEQ	ADEQ	R2	6-10
955	Concession 7 Road	Line 5 Road	Regional Road 55 - Niagara Stone Road	0.842	1,355	ADEQ	ADEQ	ADEQ	1-5	ADEQ	ADEQ	PR2	1-5
960	Concession 7 Road	Regional Road 55 - Niagara Stone Road	Line 3 Road	0.755	200	ADEQ	ADEQ	ADEQ	6-10	ADEQ	ADEQ	SST++	6-10
965	Concession 7 Road	Line 3 Road	Line 2 Road	0.842	200	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
970	Concession 7 Road	Line 2 Road	Line 1 Road	0.853	100	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
975	Townline Road	81- York Road	Queenston Road	0.799	541	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
977	Westwood Court	Townline Road	East End	0.381	500	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
980	Townline Road	Queenston Road	0.15 North of Queenston Road	0.150	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	SST	ADEQ
985	Townline Road	0.15 North of Queenston Road	Martin Road	0.135	80	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ
990	Townline Road	Martin Road	House 499 Entrance	0.400	20	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	BS	ADEQ
995	Townline Road	83- Carleton Street	Line 3 Road	0.592	1,134	ADEQ	6-10	ADEQ	ADEQ	ADEQ	ADEQ	SST+	6-10
ORAA	Line 4 Road	1.0km West of Four Mile Creek Road	Concession 6 Road	0.968	1	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAB	Line 4 Road	Niagara River Parkway	Concession 1 Road	1.062	10	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	ADEQ	NONE	ADEQ

Critical Deficiencies

Current Inspection Batch

ID	Street Name	From Description	To Description	Length	AADT	Cap.	Drain	Geo	SA	Width	Type	Imp	Overall TON
ORAC	Eastchester Avenue	Regional Road 90- Airport Road	0.2km West of 90- Airport Road	0.200	1	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAD	Line 8 Road	0.3km West of Concession 7 Road	Townline Road	0.739	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAE	Line 8 Road	Concession 6 Road	0.61km West of Concession 6 Road	0.679	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAF	Line 8 Road	0.55km East of Concession 6 Road	0.1km West of Concession 5 Road	0.361	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAG	Line 8 Road	Concession 5 Road	0.2km West of Tanbark Road	0.869	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAH	Arnold Road	0.05km East of Concession 2 Road	0.5km West of Concession 1 Road	0.518	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAI	Line 9 Road	Tanbark Road	0.1km West of 100- Four Mile Creek Road	0.614	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAJ	Dee Road	Niagara River Parkway	Concession 1 Road	0.830	1	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAK	Concession 1 Road	81- York Road	Line 9 Road	0.851	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAL	Concession 3 Road	0.3km North of Line 8 Road	Line 7 Road	0.538	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAM	Concession 3 Road	Line 7 Road	Line 6 Road	0.832	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAN	Concession 3 Road	Line 6 Road	Line 5 Road	0.850	1	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAO	Concession 3 Road	0.2km North of Line 5 Road	Line 4 Road	0.644	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAP	Concession 3 Road	Line 4 Road	Line 3 Road	0.833	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAQ	Concession 3 Road	0.3km South of Line 2 Road	Line 2 Road	0.300	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAR	Concession 3 Road	Line 2 Road	0.5km South of Line 1 Road	0.341	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAS	Concession 3 Road	Line 1 Road	East and West Line	0.911	1	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAT	Tanbark Road	Line 8 Road	Line 9 Road	0.826	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAV	Concession 5 Road	0.4km North of Line 7 Road	Line 6 Road	0.424	1	ADEQ	6-10	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAW	Townline Road	House 499 Entrance	Line 8 Road	0.156	1	ADEQ	1-5	ADEQ	NOW	ADEQ	ADEQ	NONE	ADEQ
ORAX	McNab Road	Queenston Road	Regional Road 55 - Niagara Stone Road	1.422	1	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAY	McNab Road	Regional Road 55 - Niagara Stone Road	83- Carleton Street	2.062	1	ADEQ	6-10	ADEQ	NOW	NOW	ADEQ	NONE	ADEQ
ORAZ	Dee Road	Queenston Street	0.2km East of the Niagara River Parkway	0.122	30	ADEQ	1-5	ADEQ	NOW	NOW	ADEQ	REC	ADEQ
				261.257									

Appendix K: Needs Sorted by Time of Need and Improvement Category

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
SST++										
40.00	165	Scott Street	Stewart Road	McNab Road	643	0.945	NOW	Rehab	SST++	42,513.74
37.00	480	Line 8 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	725	0.499	6-10	Rehab	SST++	23,164.96
34.00	485	Line 8 Road	Concession 3 Road	Concession 2 Road	725	1.064	6-10	Rehab	SST++	49,393.81
34.00	530	Line 9 Road	Concession 1 Road	Concession 2 Road	483	1.063	6-10	Rehab	SST++	49,347.39
31.00	375	Line 6 Road	Concession 5 Road	Regional Road 100 - Four Mile Creek Road	500	1.337	6-10	Rehab	SST++	63,026.30
29.00	330	Line 5 Road	Concession 6 Road	Concession 5 Road	502	0.970	6-10	Rehab	SST++	45,030.07
22.00	310	Line 4 Road	0.1km East of 100- Four Mile Creek Road	Concession 3 Road	300	0.959	6-10	Rehab	SST++	47,959.05
22.00	645	Concession 1 Road	Line 5 Road	Larkin Road	735	0.421	6-10	Rehab	SST++	20,449.98
20.00	815	Concession 4 Road	East and West Line	Hunter Road	406	0.781	6-10	Rehab	SST++	37,936.90
19.00	225	Line 2 Road	Concession 3 Road	Concession 2 Road	830	1.047	6-10	Rehab	SST++	52,359.89
19.00	960	Concession 7 Road	Regional Road 55 - Niagara Stone Road	Line 3 Road	200	0.755	6-10	Rehab	SST++	36,673.96
18.00	470	Line 8 Road	Tanbark Road	0.2km West of Tanbark Road	70	0.200	ADEQ	Rehab	SST++	8,567.22
18.00	315	Line 4 Road	Concession 3 Road	Concession 2 Road	300	1.041	6-10	Rehab	SST++	52,059.83
15.00	1060	McNab Road	Church Road	87- Lakeshore Road	120	1.051	6-10	Rehab	SST++	50,298.16
15.00	810	Concession 4 Road	Regional Road 55 - Niagara Stone Road	East and West Line	969	0.385	6-10	Rehab	SST++	21,463.04
13.00	845	Concession 5 Road	Line 6 Road	Line 5 Road	80	0.854	6-10	Rehab	SST++	39,645.03
						13.372				639,889.33
SST+										
36.00	1000	Townline Road	Line 3 Road	Scott Street	1,456	0.520	6-10	Rehab	SST+	18,489.90
33.00	995	Townline Road	83- Carleton Street	Line 3 Road	1,134	0.592	6-10	Rehab	SST+	21,050.04
22.00	620	Concession 1 Road	Arnold Road	Line 8 Road (West)	485	0.165	6-10	Rehab	SST+	5,703.64
17.00	280	Line 3 Road	Concession 2 Road	Concession 1 Road	928	1.114	ADEQ	Rehab	SST+	40,713.92
						2.391				85,957.50
SST										
16.00	435	Line 7 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	300	0.671	ADEQ	Rehab	SST	20,925.14
16.00	440	Line 7 Road	Concession 3 Road	Concession 2 Road	300	1.050	ADEQ	Rehab	SST	32,744.25
13.00	475	Line 8 Road	Tanbark Road	Regional Road 100 - Four Mile Creek Road	125	0.563	ADEQ	Rehab	SST	16,721.10
12.00	965	Concession 7 Road	Line 3 Road	Line 2 Road	200	0.842	ADEQ	Rehab	SST	26,257.77
12.00	970	Concession 7 Road	Line 2 Road	Line 1 Road	100	0.853	ADEQ	Rehab	SST	26,600.81
12.00	782	Tanbark Road	200m N of Stoneridge Crescent	Line 9 Road	50	0.388	ADEQ	Rehab	SST	11,523.60
11.00	445	Line 7 Road	Concession 2 Road	Concession 1 Road	50	1.085	ADEQ	Rehab	SST	33,835.73
8.00	925	Wagg Road	East and West Line	North End Cul De Sac	50	0.902	ADEQ	Rehab	SST	27,682.38
7.00	980	Townline Road	Queenston Road	0.15 North of Queenston Road	80	0.150	ADEQ	Rehab	SST	4,529.25
						6.504				200,820.03
R2										
34.00	220	Line 2 Road	Concession 4 Road	Concession 3 Road	1,438	1.066	6-10	Rehab	R2	262,995.40
25.00	4845	King Street	Johnson Street	Queen Street	3,783	0.154	1-5	Rehab	R2	150,367.35
25.00	4455	Mary Street	Regent Street	King Street	3,800	0.150	1-5	Rehab	R2	50,272.85
25.00	4440	Mary Street	Simcoe Street	Gate Street	3,800	0.143	1-5	Rehab	R2	47,926.79
25.00	4445	Mary Street	Gate Street	Victoria Street	3,800	0.150	1-5	Rehab	R2	50,272.85
24.00	950	Concession 7 Road	Line 6 Road	Line 5 Road	1,450	0.842	6-10	Rehab	R2	226,151.31
23.00	4080	Ricardo Street	Nelson Street	Collingwood Street	1,700	0.161	1-5	Rehab	R2	110,096.64
22.00	4505	John Street East	Park Court	Charlotte Street	1,200	0.131	1-5	Rehab	R2	37,863.76
21.00	4070	Ricardo Street	Melville Street	0.12km East of Melville Street	1,700	0.120	1-5	Rehab	R2	68,555.85
20.00	270	Line 3 Road	Concession 4 Road	Concession 3 Road	706	1.069	6-10	Rehab	R2	273,089.65

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
20.00	4075	Ricardo Street	0.12km East of Melville Street	Nelson Street	1,700	0.093	1-5	Rehab	R2	63,596.20
20.00	4435	Mary Street	Mississagua Street	Simcoe Street	3,650	0.154	1-5	Rehab	R2	51,613.45
19.00	275	Line 3 Road	Concession 3 Road	Concession 2 Road	706	1.041	6-10	Rehab	R2	265,936.70
18.00	5165	Dorchester Street	Johnson Street	Queen Street	300	0.152	6-10	Rehab	R2	36,099.60
18.00	4500	John Street East	Park Court	Park Court	1,200	0.094	1-5	Rehab	R2	28,132.72
18.00	4495	John Street East	King Street	Park Court	1,200	0.137	1-5	Rehab	R2	43,107.92
18.00	4085	Ricardo Street	Collingwood Street	0.12km East of Collingwood Street	1,175	0.117	1-5	Rehab	R2	80,008.12
18.00	3080	Henry Street	Line 1 Road	Pine Street	1,031	0.153	1-5	Rehab	R2	87,408.71
17.00	3140	Elden Street	Penner Street	North End Cul De Sac	200	0.171	NOW	Rehab	R2	97,692.10
17.00	5435	Lower Canada Drive	Garrison Village Drive	Confederation Drive (West)	700	0.121	1-5	Rehab	R2	69,127.16
16.00	5440	Lower Canada Drive	Confederation Drive (West)	Confederation Drive (East)	567	0.225	1-5	Rehab	R2	128,542.23
16.00	5450	Confederation Drive	Navy Hall Circle	Lower Canada Drive	550	0.528	1-5	Rehab	R2	301,645.77
16.00	4645	The Promenade	Coach Drive (South)	Coach Drive (North)	400	0.535	1-5	Rehab	R2	312,869.36
14.00	4640	The Promenade	Charlotte Street	Coach Drive (South)	400	0.093	1-5	Rehab	R2	54,386.64
14.00	3035	Frontier Drive	Cherry Street	Hearth Court	400	0.156	1-5	Rehab	R2	89,824.81
13.00	4650	The Promenade	Coach Drive (North)	Charlotte Street	400	0.193	1-5	Rehab	R2	112,866.90
13.00	4655	Coach Drive	The Promenade (South)	Settlers Court	200	0.171	1-5	Rehab	R2	100,001.24
13.00	4660	Coach Drive	Settlers Court	The Promenade (North)	200	0.129	1-5	Rehab	R2	75,439.53
12.00	355	Browns Point Circle	Niagara River Parkway	West End Cul De Sac	50	0.221	NOW	Rehab	R2	126,257.04
12.00	4550	Weatherstone Court	Charlotte Street	East End Cul de sac	100	0.179	1-5	Rehab	R2	103,068.21
11.00	4665	Settlers Court	Coach Drive	South End Cul De Sac	100	0.180	1-5	Rehab	R2	105,264.46
11.00	4565	James Street	Charlotte Street	West End	150	0.219	1-5	Rehab	R2	125,114.44
10.00	5545	Navy Hall Circle	Confederation Drive	East End Cul de sac	100	0.181	1-5	Rehab	R2	103,405.08
						9.229				3,839,000.84
R1										
39.00	870	Concession 6 Road	Queenston Road	Line 8 Road	1,550	0.836	6-10	Rehab	R1	112,010.79
38.00	685	Concession 2 Road	Line 9 Road	Arnold Road	1,592	0.672	6-10	Rehab	R1	89,112.34
31.00	710	Concession 2 Road	Line 5 Road	Larkin Road	1,340	0.420	6-10	Rehab	R1	57,460.10
29.00	715	Concession 2 Road	Larkin Road	Line 4 Road	1,340	0.437	6-10	Rehab	R1	59,152.65
28.00	25	East and West Line	Regional Road 100 - Four Mile Creek Road	0.4km East of 100- Four Mile Creek Road	8,187	0.400	6-10	Rehab	R1	61,727.40
26.00	680	Concession 2 Road	0.3km North of 81- York Road	Line 9 Road	2,257	0.605	6-10	Rehab	R1	93,099.70
25.00	4190	Queen's Parade	Wellington Street	150m East of Wellington Ave	6,890	0.150	6-10	Rehab	R1	88,671.01
25.00	915	Concession 6 Road	Line 2 Road	Line 1 Road	650	0.840	1-5	Rehab	R1	113,436.14
23.00	4920	Victoria Street	John Street West	Mary Street	250	0.153	6-10	Rehab	R1	19,912.89
22.00	5110	Butler Street	John Street West	Mary Street	150	0.160	6-10	Rehab	R1	18,999.79
22.00	4520	Anne Street	55- Mississauga Street	Simcoe Street	750	0.149	6-10	Rehab	R1	21,003.23
21.00	4415	William Street	Simcoe Street	Gate Street	200	0.145	6-10	Rehab	R1	17,400.59
19.00	30	East and West Line	0.4km East of 100- Four Mile Creek Road	Concession 4 Road	3,250	0.638	6-10	Rehab	R1	98,455.20
18.00	5190	Nassau Street	Johnson Street	Queen Street	100	0.152	6-10	Rehab	R1	18,349.65
18.00	4855	King Street	Byron Street	Ricardo Street	1,758	0.150	6-10	Rehab	R1	91,970.41
18.00	4535	Anne Street	Victoria Street	88m East of Victoria St.	600	0.088	6-10	Rehab	R1	12,237.75
17.00	10195	Four Mile Creek Road	Pleasant Lane	East and West Line	2,500	0.605	6-10	Rehab	R1	284,448.05
17.00	4850	King Street	Queen Street	Byron Street	2,538	0.153	6-10	Rehab	R1	93,809.82
17.00	5075	Anderson Lane	55- Mississauga Street	Simcoe Street	1,000	0.259	6-10	Rehab	R1	113,938.64
17.00	5045	Simcoe Street	William Street	Centre Street	400	0.152	6-10	Rehab	R1	21,048.37
17.00	580	Queenston Road	Concession 5 Road	Semi-Urban Section (St. David's)	837	0.941	6-10	Rehab	R1	148,781.56
17.00	4305	Gage Street	Simcoe Street	Gate Street	200	0.150	6-10	Rehab	R1	19,291.86

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
16.00	575	Queenston Road	Concession 6 Road	Concession 5 Road	1,114	1.031	6-10	Rehab	R1	163,011.47
16.00	5420	Garrison Village Drive	Lower Canada Drive	Samuel Street	1,200	0.081	6-10	Rehab	R1	38,305.84
16.00	5405	Garrison Village Drive	Tottenham Court	Upper Canada Drive	1,200	0.099	6-10	Rehab	R1	46,818.24
16.00	4820	King Street	John Street	Mary Street	2,000	0.154	6-10	Rehab	R1	22,477.40
15.00	4995	Gate Street	Johnson Street	Queen Street	656	0.155	6-10	Rehab	R1	78,841.53
15.00	5195	Newark Street	Johnson Street	Raiana Drive	200	0.152	6-10	Rehab	R1	19,560.77
15.00	4510	John Street East	Charlotte Street	Niagara River Parkway	672	1.132	6-10	Rehab	R1	171,954.76
14.00	10020	Bunny Glen Drive	Apricot Glen Drive	Red Haven Drive	600	0.097	6-10	Rehab	R1	42,672.01
14.00	4755	Rye Street	Niagara Street	Cottage Street	1,232	0.213	6-10	Rehab	R1	94,873.73
14.00	5410	Garrison Village Drive	Upper Canada Drive	Village Drive, NOTL	1,200	0.090	6-10	Rehab	R1	42,562.04
14.00	5415	Garrison Village Drive	Village Road	Lower Canada Drive	1,200	0.056	6-10	Rehab	R1	26,483.04
14.00	5400	Garrison Village Drive	Westgate Drive	Tottenham Court	1,200	0.078	6-10	Rehab	R1	36,887.10
14.00	570	Queenston Road	Concession 7 Road	Concession 6 Road	879	0.866	6-10	Rehab	R1	136,923.30
13.00	10010	Apricot Glen Drive	Tanbark Road	Bunny Glen Drive	600	0.117	6-10	Rehab	R1	51,470.35
13.00	5445	Confederation Drive	Lower Canada Drive	Navy Hall Circle	400	0.116	6-10	Rehab	R1	51,030.43
13.00	5460	Upper Canada Drive	Garrison Village Drive	Southgate Circle	500	0.283	6-10	Rehab	R1	125,274.77
12.00	10030	Bunny Glen Drive	Red Haven Drive	Creekside Drive	600	0.209	6-10	Rehab	R1	91,942.77
12.00	3085	Henry Street	Pine Street	Cherry Street	413	0.316	6-10	Rehab	R1	139,013.95
12.00	3090	Henry Street	Cherry Street	Andres Street	800	0.265	6-10	Rehab	R1	116,578.15
11.00	11020	Garrison Village Drive	Jordan Street	Regional Road 55 - Niagara Stone Road	1,000	0.169	6-10	Rehab	R1	76,204.73
11.00	3100	Cherry Street	Frontier Drive	Andres Street	500	0.097	6-10	Rehab	R1	42,672.01
11.00	4460	John Street West	Dorchester Street	Butler Street	338	0.147	6-10	Rehab	R1	64,667.88
10.00	3050	Hearth Court	Frontier Drive	South End Cul De Sac	100	0.161	6-10	Rehab	R1	71,269.39
9.00	5455	Confederation Drive	Lower Canada Drive	Upper Canada Drive	100	0.096	6-10	Rehab	R1	42,496.04
9.00	4960	Karsam Court	Simcoe Street	North End Cul De Sac	150	0.170	6-10	Rehab	R1	74,785.98
9.00	5180	Nassau Street	0.1km North of William Street	Hampton Court	250	0.103	6-10	Rehab	R1	45,311.51
9.00	5185	Nassau Street	Hampton Court	Johnson Street	250	0.243	6-10	Rehab	R1	106,899.96
8.00	5430	Sentry Circle	Garrison Village Drive	West End Cul De Sac	100	0.119	6-10	Rehab	R1	52,677.38
8.00	4545	Christopher Street	Charlotte Street	East End Cul de sac	100	0.114	6-10	Rehab	R1	50,150.61
7.00	5470	Upper Canada Drive	Confederation Drive	Colonel Butler Crescent	80	0.087	6-10	Rehab	R1	38,512.03
6.00	400	Eastchester Avenue	House 165 Entrance	Regional Road 88 - Stewart Road	30	0.078	ADEQ	Rehab	R1	10,531.77
						15.349				3,827,178.88
PR2										
49.00	4200	Queen's Parade	0.40km East of Wellington Street	John Street	6,890	0.993	NOW	Rehab	PR2	270,984.74
47.00	1075	Read Road	Carlton Street	Scott Street	2,400	0.273	NOW	Rehab	PR2	70,384.45
45.00	4195	Queen's Parade	0.15km East of Wellington Street	0.40km East of Wellington Street	6,890	0.250	1-5	Rehab	PR2	68,223.75
42.00	1080	Read Road	Scott Street	Church Road	2,400	1.061	NOW	Rehab	PR2	287,015.88
42.00	5	East and West Line	87- Lakeshore Road	Townline Road	3,250	0.253	1-5	Rehab	PR2	71,730.81
41.00	1085	Read Road	Church Road	87- Lakeshore Road	2,000	1.162	NOW	Rehab	PR2	342,199.70
39.00	805	Concession 4 Road	Line 1 Road	Regional Road 55 - Niagara Stone Road	989	0.516	NOW	Rehab	PR2	128,174.40
38.00	545	Queenston Road	Coon Road	Regional Road 90- Airport Road	738	0.863	1-5	Rehab	PR2	218,984.09
37.00	15	East and West Line	Concession 6 Road	0.5km East of Concession Road 6	3,513	0.500	NOW	Rehab	PR2	141,760.50
36.00	20	East and West Line	0.5km East of Concession Road 6	Regional Road 100 - Four Mile Creek Road	3,250	0.456	NOW	Rehab	PR2	129,285.58
36.00	10	East and West Line	Townline Road	Concession 6 Road	3,250	2.027	NOW	Rehab	PR2	574,697.07
36.00	540	Queenston Road	0.4km East of 55- Niagara Stone Road	Coon Road	1,000	0.375	1-5	Rehab	PR2	98,829.56
35.00	27369	Lampman Court	89- Glendale Avenue	East End Cul de sac	1,200	0.385	NOW	Rehab	PR2	107,641.15
34.00	955	Concession 7 Road	Line 5 Road	Regional Road 55 - Niagara Stone Road	1,355	0.842	1-5	Rehab	PR2	226,524.10

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
33.00	250	Line 3 Road	0.1km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	250	0.100	NOW	Rehab	PR2	26,806.50
32.00	945	Concession 7 Road	Line 7 Road	Line 6 Road	1,441	0.845	1-5	Rehab	PR2	216,224.09
31.00	930	Concession 7 Road	81- York Road	Queenston Road	1,573	0.868	1-5	Rehab	PR2	230,554.25
29.00	940	Concession 7 Road	Line 8 Road	Line 7 Road	1,109	0.844	NOW	Rehab	PR2	229,886.61
28.00	40	East and West Line	Regional Road 55 - Niagara Stone Road	Concession 3 Road	2,586	0.692	NOW	Rehab	PR2	215,367.35
28.00	45	East and West Line	Concession 3 Road	Concession 2 Road	2,586	1.048	NOW	Rehab	PR2	326,163.28
27.00	935	Concession 7 Road	Queenston Road	Line 8 Road	1,000	0.810	1-5	Rehab	PR2	219,060.86
22.00	1045	Coon Road	Regional Road 81- York Road	Queenston Road	200	0.185	NOW	Rehab	PR2	52,713.07
18.00	1070	Read Road	83- Carleton Street	Seaway Haulage Road	25	0.490	ADEQ	Rehab	PR2	126,331.07
						15.838				4,379,542.86
DSTrehab										
54.00	1015	Townline Road	Line 1 Road	East and West Line	1,021	0.925	1-5	Rehab	DSTrehab	177,253.13
48.00	1010	Townline Road	Line 2 Road	Line 1 Road	1,174	0.807	1-5	Rehab	DSTrehab	154,641.38
40.00	1005	Townline Road	Scott Street	Line 2 Road	1,260	0.315	6-10	Rehab	DSTrehab	62,776.35
34.00	95	Line 1 Road	Concession 7 Road	0.2km West of Concession 6 Road	1,000	0.804	1-5	Rehab	DSTrehab	170,500.26
28.00	140	Line 1 Road	Concession 4 Road	Concession 3 Road	781	1.068	6-10	Rehab	DSTrehab	283,788.96
24.00	340	Line 5 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	350	0.972	NOW	Rehab	DSTrehab	198,676.80
24.00	830	Concession 5 Road	0.2km North of Queenston Road	Line 8 Road	350	0.705	NOW	Rehab	DSTrehab	144,102.00
24.00	670	Concession 1 Road	Line 1 Road	East and West Line	655	0.900	6-10	Rehab	DSTrehab	183,960.00
24.00	145	Line 1 Road	Concession 3 Road	Concession 2 Road	850	1.049	1-5	Rehab	DSTrehab	227,816.58
24.00	350	Line 5 Road	Concession 2 Road	Concession 1 Road	350	1.113	1-5	Rehab	DSTrehab	199,060.05
21.00	495	Line 8 Road	Concession 1 Road	Niagara River Parkway	340	0.908	1-5	Rehab	DSTrehab	185,595.20
21.00	370	Line 6 Road	Concession 6 Road	Concession 5 Road	500	0.974	1-5	Rehab	DSTrehab	204,062.74
21.00	335	Line 5 Road	Regional Road 100 - Four Mile Creek Road	Concession 5 Road	500	1.188	1-5	Rehab	DSTrehab	258,003.90
20.00	525	Line 9 Road	Concession 3 Road	Concession 2 Road	300	1.066	1-5	Rehab	DSTrehab	217,890.40
19.00	365	Line 6 Road	Concession 7 Road	Concession 6 Road	250	0.922	1-5	Rehab	DSTrehab	181,389.67
14.00	455	Lincoln Avenue	Regional Road 90- Airport Road	East End	250	0.877	1-5	Rehab	DSTrehab	201,666.15
10.00	512	Line 9 Road	West End Cul De Sac	Tanbark Road	30	0.514	ADEQ	Rehab	DSTrehab	124,760.65
9.00	462	Line 8 Road	Concession 7 Road	0.3km East of Concession 7 Road	20	0.303	ADEQ	Rehab	DSTrehab	67,352.36
						15.410				3,243,296.58
SR										
12.00	3055	Plantation Drive	Homestead Drive	129m West of Homestead Drive	60	0.129	NOW	Maint	SR	0.00
6.00	3060	Harvest Drive	Homestead Drive	0.1 km West of Homestead	60	0.100	6-10	Maint	SR	0.00
						0.229				0.00
SD										
58.00	675	Concession 2 Road	81- York Road	0.3km North of 81- York Road	1,582	0.300	6-10	Maint	SD	4,920.00
35.00	70	Church Road	86- Stewart Road	McNab Road	615	0.928	6-10	Maint	SD	15,219.20
32.00	4975	Gate Street	Mary Street	William Street	350	0.158	NOW	Maint	SD	2,591.20
32.00	665	Concession 1 Road	Line 2 Road	Line 1 Road	1,800	0.838	6-10	Maint	SD	13,743.20
25.00	4595	Niagara Street	0.13km South of Charlotte Street	East and West Line	2,098	0.317	6-10	Maint	SD	5,198.80
25.00	4425	William Street	Victoria Street	Regent Street	200	0.149	6-10	Maint	SD	2,443.60
24.00	5320	Chautauqua Amphitheatre	William Street	William Street	300	0.424	6-10	Maint	SD	6,953.60
24.00	4570	Flynn Street	Rye Street	Green Street	400	0.266	6-10	Maint	SD	4,362.40
24.00	640	Concession 1 Road	Line 6 Road (West)	Line 5 Road	735	0.837	6-10	Maint	SD	13,726.80
24.00	630	Concession 1 Road	Line 7 Road	Line 6 Road (East)	736	0.564	6-10	Maint	SD	9,249.60
22.00	4790	Ball Street	Ricardo Street	Delater Street	80	0.071	NOW	Maint	SD	1,164.40

Total Needs Summary by Improvement Type

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Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
22.00	1145	Warner Road	West End Cul De Sac	Concession 5 Road	40	0.284	ADEQ	Maint	SD	4,657.60
22.00	490	Line 8 Road	Concession 2 Road	Concession 1 Road	400	1.071	6-10	Maint	SD	17,564.40
21.00	300	Line 4 Road	1.0km West of 100- Four Mile Creek Road	Regional Road 100 - Four Mile Creek Road	140	1.080	6-10	Maint	SD	17,712.00
21.00	650	Concession 1 Road	Larkin Road	Line 4 Road	735	0.428	6-10	Maint	SD	7,019.20
21.00	4730	Wellington Street	Byron Street	Ricardo Street	1,000	0.148	1-5	Maint	SD	2,427.20
20.00	655	Concession 1 Road	Line 4 Road	Line 3 Road	739	0.830	ADEQ	Maint	SD	13,612.00
20.00	105	Line 1 Road	Concession 6 Road	Homestead Drive	1,292	0.527	6-10	Maint	SD	8,642.80
20.00	4060	Ricardo Street	Ball Street	Wellington Street	1,700	0.064	6-10	Maint	SD	1,049.60
20.00	4065	Ricardo Street	Wellington Street	Melville Street	1,700	0.100	6-10	Maint	SD	1,640.00
19.00	4980	Gate Street	William Street	Centre Street	400	0.153	6-10	Maint	SD	2,509.20
18.00	24264	Palatine Place	Circle Street	End	20	0.074	ADEQ	Maint	SD	1,213.60
18.00	10210	Four Mile Creek Road	Hunter Road	Wall Road	1,500	0.773	6-10	Maint	SD	12,677.20
18.00	380	Line 6 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	450	0.823	6-10	Maint	SD	13,497.20
17.00	1035	Irvine Road	Church Road	Lakeshore Road	400	1.099	ADEQ	Maint	SD	18,023.60
17.00	4240	Johnson Street	Simcoe Street	Gate Street	870	0.150	6-10	Maint	SD	2,460.00
16.00	5130	Butler Street	Johnson Street	South End	30	0.053	ADEQ	Maint	SD	869.20
16.00	10200	Four Mile Creek Road	East and West Line	Hunter Road	1,769	1.020	6-10	Maint	SD	16,728.00
16.00	4045	Front Street	Victoria Street	Regent Street	2,100	0.148	6-10	Maint	SD	2,427.20
16.00	385	Line 6 Road	Concession 3 Road	Concession 2 Road	450	1.039	6-10	Maint	SD	17,039.60
15.00	5170	Nassau Street	87- Lakeshore Road	William Street	300	0.230	ADEQ	Maint	SD	3,772.00
15.00	390	Line 6 Road	Concession 2 Road	Concession 1 Road	250	1.096	ADEQ	Maint	SD	17,974.40
15.00	5135	Butler Street	Johnson Street	Queen Street	200	0.152	6-10	Maint	SD	2,492.80
14.00	1055	McNab Road	Scott Street	Church Road	86	1.051	ADEQ	Maint	SD	17,236.40
14.00	1050	McNab Road	83- Carleton Street	Scott Street	128	1.097	6-10	Maint	SD	17,990.80
14.00	2030	Dumfries Street	Niagara River Parkway	Queenston Street	220	0.208	6-10	Maint	SD	3,411.20
14.00	5275	Dixie Avenue	87- Lakeshore Road	Chautauqua Amphitheatre	300	0.339	6-10	Maint	SD	5,559.60
14.00	4055	Ricardo Street	King Street	Ball Street	436	0.245	6-10	Maint	SD	4,018.00
14.00	430	Line 7 Road	Concession 5 Road	Regional Road 100 - Four Mile Creek Road	350	1.477	6-10	Maint	SD	24,222.80
13.00	5315	Froebel Avenue	Chautauqua Amphitheatre	North End	20	0.059	ADEQ	Maint	SD	967.60
13.00	4280	Lakeview Street	Niagara Boulevard	Orchard Drive	50	0.093	6-10	Maint	SD	1,525.20
13.00	4225	Johnson Street	Dorchester Street	Butler Street	525	0.154	6-10	Maint	SD	2,525.60
13.00	4575	Flynn Street	Green Street	Charlotte Street	80	0.143	6-10	Maint	SD	2,345.20
13.00	4485	John Street West	Victoria Street	Regent Street	1,800	0.149	6-10	Maint	SD	2,443.60
12.00	170	Scott Street	McNab Road	Irvine Road	350	0.918	ADEQ	Maint	SD	15,055.20
12.00	10220	Four Mile Creek Road	Wall Road	Lakeshore Road	1,500	0.594	6-10	Maint	SD	9,741.60
12.00	565	Queenston Road	0.5km East of Townline Road	Concession 7 Road	876	0.546	6-10	Maint	SD	8,954.40
12.00	4375	Centre Street	Gate Street	Victoria Street	320	0.147	6-10	Maint	SD	2,410.80
12.00	4295	Gage Street	Butler Street	Mississagua Street	160	0.155	6-10	Maint	SD	2,542.00
11.00	5030	Simcoe Street	Anne Street	John Street West	39	0.147	ADEQ	Maint	SD	2,410.80
11.00	4875	Regent Street	Mary Street	William Street	300	0.156	6-10	Maint	SD	2,558.40
11.00	4290	Gage Street	Dorchester Street	Butler Street	150	0.154	6-10	Maint	SD	2,525.60
11.00	4050	Front Street	Regent Street	King Street	1,200	0.150	6-10	Maint	SD	2,460.00
11.00	4370	Centre Street	Simcoe Street	Gate Street	320	0.149	6-10	Maint	SD	2,443.60
11.00	4410	William Street	Mississagua Street	Simcoe Street	200	0.154	6-10	Maint	SD	2,525.60
10.00	4365	Centre Street	Mississagua Street	Simcoe Street	210	0.153	ADEQ	Maint	SD	2,509.20
10.00	2040	Partition Street	Niagara River Parkway	Queenston Street	250	0.207	6-10	Maint	SD	3,394.80
10.00	2020	Highlander Street	Niagara River Parkway	Queenston Street	130	0.207	6-10	Maint	SD	3,394.80
10.00	4880	Regent Street	William Street	Centre Street	400	0.156	6-10	Maint	SD	2,558.40

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Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
10.00	4860	King Street	Ricardo Street	Delater Street	600	0.065	6-10	Maint	SD	1,066.00
10.00	4800	King Street	Cottage Street	South End	200	0.162	6-10	Maint	SD	2,656.80
10.00	5035	Simcoe Street	John Street West	Mary Street	314	0.154	6-10	Maint	SD	2,525.60
10.00	3095	Pine Street	Henry Street	East End	100	0.109	6-10	Maint	SD	1,787.60
9.00	1090	Read Road	87- Lakeshore Road	Northrup Crescent	120	0.545	ADEQ	Maint	SD	8,938.00
9.00	5050	Simcoe Street	Centre Street	Gage Street	450	0.146	ADEQ	Maint	SD	2,394.40
9.00	5055	Simcoe Street	Gage Street	Johnson Street	450	0.146	ADEQ	Maint	SD	2,394.40
9.00	5120	Butler Street	William Street	Centre Street	200	0.149	ADEQ	Maint	SD	2,443.60
9.00	5175	Nassau Street	William Street	0.1km North of William Street	250	0.101	ADEQ	Maint	SD	1,656.40
9.00	4870	Regent Street	John Street West	Mary Street	250	0.153	6-10	Maint	SD	2,509.20
9.00	4315	Gage Street	Victoria Street	Regent Street	200	0.150	6-10	Maint	SD	2,460.00
8.00	4310	Gage Street	Gate Street	Victoria Street	200	0.146	ADEQ	Maint	SD	2,394.40
8.00	5200	Palatine Place	0.02km South of Landsdowne Avenue	Orchard Drive	200	0.177	6-10	Maint	SD	2,902.80
8.00	5115	Butler Street	Mary Street	William Street	200	0.156	6-10	Maint	SD	2,558.40
8.00	560	Queenston Road	Townline Road	0.5km East of Townline Road	1,314	0.500	6-10	Maint	SD	8,200.00
8.00	4300	Gage Street	Mississagua Street	Simcoe Street	160	0.153	6-10	Maint	SD	2,509.20
8.00	4325	Castlereagh Street	King Street	Davy Street	500	0.157	6-10	Maint	SD	2,574.80
8.00	4330	Castlereagh Street	Davy Street	Wellington Street	300	0.142	6-10	Maint	SD	2,328.80
7.00	4205	Johnson Street	Niagara Boulevard	Palatine Place	100	0.062	ADEQ	Maint	SD	1,016.80
7.00	26309	Counsell Street	Regional Road 81- York Road	North End Cul De Sac	145	0.179	6-10	Maint	SD	2,935.60
7.00	4605	Melville Street	Byron Street	Ricardo Street	800	0.149	6-10	Maint	SD	2,443.60
6.00	255	Line 3 Road	Concession 6 Road	West End Cul De Sac	300	0.083	ADEQ	Maint	SD	1,361.20
4.00	4285	Gage Street	Dorchester Street	0.1km West of Dorchester Street	40	0.091	ADEQ	Maint	SD	1,492.40
4.00	550	Queenston Road	Regional Road 90- Airport Road	Martin Road	997	0.188	6-10	Maint	SD	3,083.20
3.00	4125	Byron Street	Nelson Street	East End	100	0.106	6-10	Maint	SD	1,738.40
						29.371				481,684.40
MICRO										
14.00	4355	Centre Street	Dorchester Street	Butler Street	150	0.153	6-10	Maint	MICRO	5,469.75
11.00	1180	Niagara-on-the-Green Boulevard	89- Glendale Avenue	Stevens Drive	1,741	0.138	ADEQ	Maint	MICRO	10,626.00
10.00	1185	Niagara-on-the-Green Boulevard	Stevens Drive	Robertson Road	1,338	0.063	ADEQ	Maint	MICRO	4,054.05
10.00	1190	Niagara-on-the-Green Boulevard	Robertson Road	Cole Crescent	1,200	0.065	ADEQ	Maint	MICRO	4,182.75
10.00	5065	Simcoe Street	Queen Street	Prideaux Street	800	0.155	ADEQ	Maint	MICRO	7,246.25
10.00	3210	Bianca Drive	Loretta Drive	Loretta Drive	1,000	0.171	ADEQ	Maint	MICRO	7,994.25
10.00	9000	Young Crescent	Niagara-on-the-Green Blvd.	Niagara-on-the-Green Blvd.	500	0.411	ADEQ	Maint	MICRO	19,214.25
9.00	1210	Robertson Road	Niagara-on-the-Green Blvd.	Cole Crescent	450	0.219	ADEQ	Maint	MICRO	10,238.25
9.00	5070	Simcoe Street	Prideaux Street	Front Street	600	0.144	ADEQ	Maint	MICRO	6,732.00
8.00	1195	Niagara-on-the-Green Boulevard	Cole Crescent	South End Cul De Sac	500	0.094	ADEQ	Maint	MICRO	6,048.90
8.00	4400	William Street	Dorchester Street	Butler Street	426	0.155	ADEQ	Maint	MICRO	7,246.25
7.00	4395	William Street	Nassau Street	Dorchester Street	483	0.149	ADEQ	Maint	MICRO	6,965.75
7.00	9010	Wright Crescent	Young Crescent	Griffiths Gate	141	0.337	ADEQ	Maint	MICRO	15,754.75
6.00	3215	Loretta Drive	Bianca Drive	Fisher Drive	800	0.286	ADEQ	Maint	MICRO	13,370.50
6.00	3205	Bianca Drive	Diana Drive	Loretta Drive	800	0.179	ADEQ	Maint	MICRO	8,368.25
5.00	3195	Diana Drive	Annmarie Drive	North End Cul De Sac	100	0.166	ADEQ	Maint	MICRO	7,760.50
5.00	9050	Wright Crescent	Haynes Court	Niagara-on-the-Green Boulevard	300	0.549	ADEQ	Maint	MICRO	25,665.75
4.00	4785	Davy Street	Platoff Street	Queens Parade- Picton	200	0.153	ADEQ	Maint	MICRO	7,321.05
						3.587				174,259.25

Total Needs Summary by Improvement Type

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CRKsd										
23.00	4840	King Street	Gage Street	Johnson Street	4,000	0.147	6-10	Maint	CRKsd	2,185.89
17.00	5215	Orchard Drive	Lansdowne Avenue	Lakeview Street	100	0.087	6-10	Maint	CRKsd	1,293.69
13.00	4915	Victoria Street	Anne Street	John Street West	299	0.149	ADEQ	Maint	CRKsd	2,215.63
13.00	4930	Victoria Street	William Street	Centre Street	400	0.155	6-10	Maint	CRKsd	2,304.85
12.00	5140	Dorchester Street	John Street West	Mary Street	300	0.162	6-10	Maint	CRKsd	2,408.94
12.00	4260	Platoff Street	King Street	Davy Street	800	0.158	6-10	Maint	CRKsd	2,349.46
11.00	4925	Victoria Street	Mary Street	William Street	400	0.156	6-10	Maint	CRKsd	2,319.72
10.00	5145	Dorchester Street	Mary Street	William Street	546	0.158	6-10	Maint	CRKsd	2,349.46
9.00	5205	Palatine Place	Orchard Drive	Johnson Street	200	0.072	6-10	Maint	CRKsd	1,070.64
						1.244				18,498.28
CRK										
27.00	720	Concession 2 Road	Line 4 Road	Line 3 Road	1,473	0.824	ADEQ	Maint	CRK	2,117.68
21.00	4430	Mary Street	Nassau Street	87- Mary Street	3,432	0.127	ADEQ	Maint	CRK	326.39
20.00	4530	Anne Street	Gate Street	Victoria Street	600	0.148	ADEQ	Maint	CRK	380.36
17.00	4770	Cottage Street	King Street	Rye Street	800	0.083	ADEQ	Maint	CRK	213.31
17.00	4020	Delater Street	King Street	Ball Street	600	0.246	ADEQ	Maint	CRK	632.22
15.00	5220	Orchard Drive	Lakeview Street	Palatine Place	100	0.111	ADEQ	Maint	CRK	285.27
13.00	5210	Palatine Place	Johnson Street	Niagara Boulevard	200	0.065	ADEQ	Maint	CRK	167.05
13.00	4185	Picton Street	Davy Street	Wellington Street	5,740	0.152	ADEQ	Maint	CRK	390.64
12.00	1115	Niven Road	Village Road	Regional Road 55 - Niagara Stone Road	2,000	0.656	ADEQ	Maint	CRK	1,685.92
12.00	4245	Johnson Street	Gate Street	Victoria Street	950	0.148	ADEQ	Maint	CRK	380.36
11.00	4900	Regent Street	Queen Street	Prideaux Street	600	0.152	ADEQ	Maint	CRK	390.64
10.00	10190	Four Mile Creek Road	Penner Street	Pleasant Lane	3,500	0.285	ADEQ	Maint	CRK	732.45
10.00	5025	Simcoe Street	Anderson Lane	Anne Street	800	0.234	ADEQ	Maint	CRK	601.38
10.00	4180	Picton Street	King Street	Davy Street	1,859	0.156	ADEQ	Maint	CRK	400.92
10.00	4255	Johnson Street	Regent Street	King Street	3,500	0.150	ADEQ	Maint	CRK	385.50
9.00	4275	Market Street	King Street	West End	600	0.057	ADEQ	Maint	CRK	146.49
9.00	4620	Melville Street	Lockhart Street	Riverbeach Drive	300	0.063	ADEQ	Maint	CRK	161.91
9.00	4625	Harmony Drive	Charlotte Street	Lucia Court	400	0.277	ADEQ	Maint	CRK	711.89
8.00	605	Mallette Crescent	Melrose Drive	End	200	0.255	ADEQ	Maint	CRK	655.35
7.00	11260	Angels Drive	Warner Road	Tanbark Road	350	0.345	ADEQ	Maint	CRK	886.65
7.00	5020	Simcoe Street	Karsam Court	Anderson Lane	500	0.145	ADEQ	Maint	CRK	372.65
7.00	5000	Gate Street	Queen Street	Prideaux Street	600	0.154	ADEQ	Maint	CRK	395.78
7.00	4950	Victoria Street	Queen Street	Prideaux Street	500	0.154	ADEQ	Maint	CRK	395.78
7.00	4955	Victoria Street	Prideaux Street	Front Street	200	0.149	ADEQ	Maint	CRK	382.93
7.00	4551	Shaw's Lane	37m North of Albion (Private Rd)	King St	250	0.203	ADEQ	Maint	CRK	521.71
6.00	4945	Victoria Street	Johnson Street	Queen Street	354	0.154	ADEQ	Maint	CRK	395.78
6.00	5010	Simcoe Street	South End	Victoria Street	200	0.065	ADEQ	Maint	CRK	167.05
6.00	5550	Samuel Street	Niven Road	Garrison Village Drive	130	0.145	ADEQ	Maint	CRK	372.65
6.00	5555	Elizabeth Street	Niven Road	Garrison Village Drive	170	0.178	ADEQ	Maint	CRK	457.46
6.00	5370	Bay Berry Lane	87- Lakeshore Road	Bay Berry Lane (East)	350	0.108	ADEQ	Maint	CRK	277.56
6.00	5480	Tottenham Court	Garrison Village Drive	East End Cul de sac	100	0.147	ADEQ	Maint	CRK	377.79
6.00	4610	Melville Street	Ricardo Street	Delater Street	650	0.070	ADEQ	Maint	CRK	179.90
6.00	4250	Johnson Street	Victoria Street	Regent Street	450	0.148	ADEQ	Maint	CRK	380.36
5.00	11000	Frontier Drive	Bordeaux Drive	Pinot Trail (P)	74	0.074	ADEQ	Maint	CRK	190.18
5.00	5375	Bay Berry Lane	Bay Berry Lane (North)	West End Cul De Sac	125	0.126	ADEQ	Maint	CRK	323.82
5.00	4270	Market Street	Regent Street	East End	600	0.046	ADEQ	Maint	CRK	118.22

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5.00	3175	Raiana Drive	Annmarie Drive	Hope Avenue	300	0.099	ADEQ	Maint	CRK	254.43
5.00	4615	Melville Street	Delater Street	Lockhart Street	300	0.070	ADEQ	Maint	CRK	179.90
5.00	9070	Smallwood Crescent	Queenston Road	Paxton Lane	200	0.508	ADEQ	Maint	CRK	1,305.56
4.00	11010	Frontier Drive	Pinot Trail (P)	West End	28	0.028	ADEQ	Maint	CRK	71.96
4.00	10040	Bunny Glen Drive	Creekside Drive	South End Cul De Sac	100	0.123	ADEQ	Maint	CRK	316.11
4.00	11150	Brock Street	Garrison Village Drive	Garrison Village Drive	500	0.035	ADEQ	Maint	CRK	89.95
4.00	11170	Garrison Village Drive	Brock Street	Jordan Street	702	0.126	ADEQ	Maint	CRK	323.82
4.00	5540	McFarland Gate	Colonel Butler Crescent	East End Cul de sac	100	0.158	ADEQ	Maint	CRK	406.06
4.00	4630	Harmony Drive	Lucia Court	East End Cul de sac	140	0.204	ADEQ	Maint	CRK	524.28
4.00	3165	Annmarie Drive	Line 2 Road	Raiana Drive	210	0.174	ADEQ	Maint	CRK	447.18
3.00	11140	Brock Street	Garrison Village Drive	Blackbird Street	45	0.045	ADEQ	Maint	CRK	115.65
3.00	11250	Stoneridge Crescent	Tanbark Road	Stoneridge Crescent	510	0.505	ADEQ	Maint	CRK	1,297.85
3.00	11210	Sorenson Court	Cul De Sac	Cul De Sac	70	0.072	ADEQ	Maint	CRK	185.04
3.00	11220	Sorenson Court	Concession 4 Road	Cul De Sac	160	0.158	ADEQ	Maint	CRK	406.06
3.00	1165	Sheppard Crescent	81- York Road	End	50	0.148	ADEQ	Maint	CRK	380.36
3.00	10050	Red Haven Drive	Bunny Glen Drive	Creekside Drive	300	0.285	ADEQ	Maint	CRK	732.45
3.00	29113	Brock Street	Macdonell Road	Cooley Lane	500	0.109	ADEQ	Maint	CRK	280.13
3.00	5015	Simcoe Street	Victoria Street	Karsam Court	120	0.114	ADEQ	Maint	CRK	292.98
3.00	9030	Wright Crescent	Griffiths Gate	Haynes Court	400	0.213	ADEQ	Maint	CRK	547.41
2.00	4635	Lucia Court	Harmony Drive	North End Cul De Sac	140	0.169	ADEQ	Maint	CRK	434.33
						9.943				25,553.51
SRR										
29.00	5265	Shakespeare Avenue	Wyckliffe Avenue	Vincent Avenue	583	0.161	6-10	Const	SRR	268,392.07
29.00	4380	Centre Street	Victoria Street	Regent Street	320	0.148	6-10	Const	SRR	246,720.65
23.00	5255	Shakespeare Avenue	Addison Avenue	Luther Avenue	650	0.084	6-10	Const	SRR	143,475.73
20.00	4235	Johnson Street	Mississagua Street	Simcoe Street	1,500	0.153	6-10	Const	SRR	267,605.80
19.00	5260	Shakespeare Avenue	Luther Avenue	Wyckliffe Avenue	600	0.109	6-10	Const	SRR	189,753.19
18.00	5250	Shakespeare Avenue	87- Lakeshore Road	Addison Avenue	1,113	0.371	6-10	Const	SRR	670,202.47
17.00	5225	Niagara Boulevard	Vincent Avenue	Wilberforce Avenue	875	0.124	6-10	Const	SRR	225,020.10
17.00	5230	Niagara Boulevard	Wilberforce Avenue	Lansdowne Avenue	875	0.187	6-10	Const	SRR	327,073.75
17.00	4985	Gate Street	Centre Street	Gage Street	400	0.147	6-10	Const	SRR	257,111.45
16.00	4970	Gate Street	John Street	Mary Street	300	0.153	6-10	Const	SRR	263,840.80
16.00	5235	Niagara Boulevard	Lansdowne Avenue	Lakeview Street	875	0.182	6-10	Const	SRR	330,271.44
16.00	5240	Niagara Boulevard	Lakeview Street	Johnson Street	875	0.098	6-10	Const	SRR	175,426.90
16.00	5245	Niagara Boulevard	Johnson Street	Palatine Place	875	0.089	6-10	Const	SRR	159,316.28
15.00	5300	Vincent Avenue	Niagara Boulevard	Shakespeare Avenue	583	0.074	6-10	Const	SRR	133,072.21
14.00	4230	Johnson Street	Butler Street	Mississagua Street	525	0.154	6-10	Const	SRR	273,144.45
13.00	4990	Gate Street	Gage Street	Johnson Street	435	0.149	6-10	Const	SRR	263,053.94
13.00	4935	Victoria Street	Centre Street	Gage Street	500	0.147	6-10	Const	SRR	257,111.45
13.00	4265	Platoff Street	Wellington Street	Davy Street	200	0.153	6-10	Const	SRR	270,115.79
10.00	4320	Gage Street	Regent Street	King Street	300	0.147	6-10	Const	SRR	257,111.45
9.00	4385	Centre Street	Regent Street	King Street	317	0.149	6-10	Const	SRR	263,053.94
8.00	4905	Regent Street	Prideaux Street	Front Street	300	0.150	6-10	Const	SRR	262,358.62
4.00	4775	Davy Street	Nelles Street	Castlereagh Street	100	0.077	6-10	Const	SRR	136,572.23
						3.206				5,639,804.71
RW										
23.00	5295	Vincent Avenue	Chautauqua Amphitheatre	Niagara Boulevard	237	0.322	NOW	Const	RW	116,683.08

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Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
23.00	5305	Wilberforce Avenue	Chautauqua Amphitheatre	Niagara Boulevard	250	0.272	NOW	Const	RW	91,609.37
21.00	5290	Wyckliffe Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	150	0.259	NOW	Const	RW	91,646.18
19.00	5285	Luther Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	80	0.196	NOW	Const	RW	66,012.63
19.00	5310	Wesley Avenue	Chautauqua Amphitheatre	North End	100	0.144	NOW	Const	RW	50,953.86
15.00	5280	Addison Avenue	Shakespeare Avenue	Chautauqua Amphitheatre	100	0.170	6-10	Const	RW	47,112.83
12.00	4585	Niagara Street	Green Street	Charlotte Street	2,000	0.151	ADEQ	Const	RW	180,477.66
						1.514				644,495.61
RSS										
51.00	5090	Mississagua Street	Centre Street	Gage Street	8,213	0.148	NOW	Const	RSS	468,439.31
46.00	5095	Mississagua Street	Gage Street	Johnson Street	6,500	0.148	1-5	Const	RSS	468,439.31
42.00	4825	King Street	Mary Street	Centre Street	3,398	0.311	1-5	Const	RSS	984,355.59
39.00	2060	Clarence Street	Kent Street	Queenston Street	100	0.267	NOW	Const	RSS	828,173.52
38.00	2045	Partition Street	Queenston Street	Front Street South	100	0.119	NOW	Const	RSS	406,775.44
37.00	2050	Kent Street	Niagara River Parkway	Queenston Street	170	0.208	NOW	Const	RSS	645,168.89
36.00	2025	Highlander Street	Queenston Street	Princess Street	150	0.100	NOW	Const	RSS	310,177.35
36.00	2145	Queenston Street	Partition Street	Kent Street	180	0.087	NOW	Const	RSS	297,390.45
35.00	2125	Princess Street	Walnut Street	Maple Street	150	0.086	NOW	Const	RSS	303,045.38
35.00	2160	Maple Street	Princess Street	Front Street South	30	0.063	ADEQ	Const	RSS	195,411.73
34.00	2130	Princess Street	Maple Street (North)	Highlander Street	150	0.104	NOW	Const	RSS	322,584.44
34.00	2135	Princess Street	Highlander Street	Dumfries Street	150	0.089	NOW	Const	RSS	276,057.84
34.00	2010	Dee Road	Niagara River Parkway	0.2km East of the Niagara River Parkway	100	0.200	NOW	Const	RSS	620,354.70
34.00	1170	Paxton Lane	Regional Road 81- York Road	0.3km South of 81- York Road	300	0.320	6-10	Const	RSS	992,567.52
34.00	5100	Mississagua Street	Johnson Street	Queen Street	6,500	0.154	1-5	Const	RSS	487,430.10
34.00	5155	Dorchester Street	Centre Street	Gage Street	400	0.148	1-5	Const	RSS	459,062.48
33.00	2035	Dumfries Street	Queenston Street	Princess Street	100	0.112	NOW	Const	RSS	382,847.47
33.00	2055	Kent Street	Queenston Street	Front Street South	100	0.104	NOW	Const	RSS	355,501.22
33.00	4885	Regent Street	Centre Street	Gage Street	516	0.148	NOW	Const	RSS	459,062.48
33.00	5080	Mississagua Street	87- Mary Street	William Street	5,016	0.162	1-5	Const	RSS	512,751.14
32.00	600	Melrose Drive	Glenwood Crescent	End	200	0.348	NOW	Const	RSS	1,189,561.79
32.00	4745	Green Street	Niagara Street	Flynn Street	150	0.389	1-5	Const	RSS	1,206,589.89
31.00	2140	Princess Street	Dumfries Street	Partition Street	238	0.095	NOW	Const	RSS	324,736.70
31.00	195	Line 2 Road	0.1km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	1,092	0.100	1-5	Const	RSS	310,177.35
31.00	5085	Mississagua Street	William Street	Centre Street	3,169	0.148	1-5	Const	RSS	468,439.31
30.00	2015	Walnut Street	Queenston Street	Princess Street	170	0.091	NOW	Const	RSS	282,261.39
30.00	190	Line 2 Road	Concession 6 Road	0.1km West of 55- Niagara Stone Road	940	0.547	1-5	Const	RSS	1,696,670.10
29.00	2065	Clarence Street	Queenston Street	Front Street South	100	0.089	NOW	Const	RSS	304,227.01
28.00	2150	Front Street	Kent Street	Clarence Street	120	0.091	NOW	Const	RSS	311,063.57
28.00	5150	Dorchester Street	William Street	Centre Street	636	0.148	NOW	Const	RSS	459,062.48
28.00	4335	Lansdowne Avenue	Niagara Boulevard	Orchard Drive	100	0.121	NOW	Const	RSS	375,314.59
28.00	4725	Wellington Street	Queens Parade- Picton	Byron Street	1,000	0.152	1-5	Const	RSS	471,469.57
28.00	4890	Regent Street	Gage Street	Johnson Street	750	0.148	1-5	Const	RSS	459,062.48
27.00	2120	Princess Street	Walnut Street	North End Cul De Sac	50	0.146	NOW	Const	RSS	452,858.93
27.00	5160	Dorchester Street	Gate Street	Johnson Street	300	0.150	6-10	Const	RSS	465,266.03
27.00	4830	King Street	Centre Street	Nelles Street	4,216	0.070	1-5	Const	RSS	221,559.14
26.00	110	Line 1 Road	Homestead Drive	Henry Street	2,000	0.195	6-10	Const	RSS	604,845.83
26.00	2155	Front Street	Clarence Street	York Street	120	0.049	1-5	Const	RSS	167,495.77
26.00	4835	King Street	Nelles Street	Gage Street	3,000	0.079	1-5	Const	RSS	250,045.31

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25.00	2085	Queenston Street	Niagara River Parkway	Dee Road	400	0.353	1-5	Const	RSS	1,206,653.19
24.00	4740	Turntable Road	Lockhart Street	Riverbeach Drive	100	0.043	NOW	Const	RSS	133,376.26
24.00	115	Line 1 Road	Henry Street	Four Mile Creek Road	2,175	0.221	1-5	Const	RSS	685,491.94
22.00	200	Line 2 Road	Regional Road 100 - Four Mile Creek Road	West End	50	0.100	NOW	Const	RSS	310,177.35
22.00	24411	Front Street South	Maple Street	Highlander Street	20	0.103	ADEQ	Const	RSS	362,949.70
22.00	4340	Lansdowne Avenue	Orchard Drive	Palatine Place	100	0.135	6-10	Const	RSS	418,739.42
21.00	4735	Turntable Road	Delater Street	Lockhart Street	100	0.067	1-5	Const	RSS	207,818.82
20.00	4940	Victoria Street	Gage Street	Johnson Street	500	0.148	6-10	Const	RSS	459,062.48
20.00	4350	Nelles Street	King Street	Davy Street	200	0.156	6-10	Const	RSS	483,876.67
20.00	4005	Turntable Way	Wellington Street	West End	50	0.045	1-5	Const	RSS	139,579.81
19.00	5060	Simcoe Street	Johnson Street	Queen Street	233	0.156	6-10	Const	RSS	483,876.67
19.00	4010	Riverbeach Drive	Wellington Street	Melville Street	200	0.114	1-5	Const	RSS	353,602.18
19.00	4465	John Street West	Butler Street	55- Mississauga Street	200	0.156	1-5	Const	RSS	483,876.67
18.00	08736	Highlander Street	Princess Street	Front Street South	20	0.047	ADEQ	Const	RSS	165,617.82
18.00	4015	Lockhart Street	Turntable Road	Melville Street	200	0.103	6-10	Const	RSS	319,482.67
17.00	4795	Ball Street	Delater Street	North End	20	0.051	ADEQ	Const	RSS	158,190.45
						8.232				26,168,675.70
RNS										
17.00	5105	Butler Street	0.1km South of John Street West	John Street West	100	0.101	6-10	Const	RNS	112,643.91
						0.101				112,643.91
RM										
34.00	4450	Mary Street	Victoria Street	Regent Street	3,800	0.148	NOW	Const	RM	80,655.81
						0.148				80,655.81
REC										
41.00	535	Queenston Road	Regional Road 55 - Niagara Stone Road	0.4km East of 55- Niagara Stone Road	1,916	0.400	1-5	Const	REC	733,533.48
40.00	825	Concession 5 Road	Queenston Road	0.2km North of Queenston Road	350	0.201	NOW	Const	REC	213,874.63
39.00	1040	Irvine Road	Lakeshore Road	North End	260	0.946	NOW	Const	REC	892,918.14
38.00	1020	Townline Road	East and West Line	Lakeshore Road	100	0.246	NOW	Const	REC	232,196.47
38.00	1065	McNab Road	87- Lakeshore Road	Fire Road 14D	400	0.850	1-5	Const	REC	850,662.73
31.00	ORAZ	Dee Road	Queenston Street	0.2km East of the Niagara River Parkway	30	0.122	ADEQ	Const	REC	134,553.81
23.00	2075	York Street	Niagara River Parkway	Front Street South	200	0.288	NOW	Const	REC	320,435.74
23.00	1093	Read Road	Northrup Crescent	North End	30	0.301	ADEQ	Const	REC	309,894.25
22.00	450	Cross Street	Regional Road 88 - Stewart Road	East End Cul de sac	50	0.323	NOW	Const	REC	323,251.84
						3.677				4,011,321.09
NONE										
37.00	28613	Eastchester Avenue	West End	House 153	50	0.058	NOW	Const	NONE	0.00
36.00	865	Concession 6 Road	Regional Road 81- York Road	Queenston Road	2,308	0.847	ADEQ	Const	NONE	0.00
32.00	ORAW	Townline Road	House 499 Entrance	Line 8 Road	1	0.156	ADEQ	Const	NONE	0.00
31.00	ORAA	Line 4 Road	1.0km West of Four Mile Creek Road	Concession 6 Road	1	0.968	ADEQ	Const	NONE	0.00
31.00	700	Concession 2 Road	Line 7 Road	Line 6 Road	1,761	0.843	ADEQ	Const	NONE	0.00
30.00	695	Concession 2 Road	Line 8 Road	Line 7 Road	1,400	0.844	ADEQ	Const	NONE	0.00
30.00	660	Concession 1 Road	Line 3 Road	Line 2 Road	1,979	0.836	ADEQ	Const	NONE	0.00
30.00	65	Church Road	Read Road	86- Stewart Road	430	0.922	ADEQ	Const	NONE	0.00
30.00	ORAV	Concession 5 Road	0.4km North of Line 7 Road	Line 6 Road	1	0.424	ADEQ	Const	NONE	0.00
29.00	ORAO	Concession 3 Road	0.2km North of Line 5 Road	Line 4 Road	1	0.644	ADEQ	Const	NONE	0.00
29.00	ORAH	Arnold Road	0.05km East of Concession 2 Road	0.5km West of Concession 1 Road	1	0.518	ADEQ	Const	NONE	0.00

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29.00	ORAJ	Dee Road	Niagara River Parkway	Concession 1 Road	1	0.830	ADEQ	Const	NONE	0.00
29.00	ORAK	Concession 1 Road	81- York Road	Line 9 Road	1	0.851	ADEQ	Const	NONE	0.00
29.00	ORAM	Concession 3 Road	Line 7 Road	Line 6 Road	1	0.832	ADEQ	Const	NONE	0.00
29.00	75	Church Road	McNab Road	Irvine Road	654	0.946	ADEQ	Const	NONE	0.00
29.00	85	Line 1 Road	Townline Road	0.2km East of Townline Road	1,006	0.201	ADEQ	Const	NONE	0.00
28.00	80	Church Road	Irvine Road	Townline Road	752	0.919	ADEQ	Const	NONE	0.00
28.00	ORAX	McNab Road	Queenston Road	Regional Road 55 - Niagara Stone Road	1	1.422	ADEQ	Const	NONE	0.00
27.00	4155	Queen Street	Mississagua Street	Simcoe Street	4,007	0.153	ADEQ	Const	NONE	0.00
27.00	ORAC	Eastchester Avenue	Regional Road 90- Airport Road	0.2km West of 90- Airport Road	1	0.200	ADEQ	Const	NONE	0.00
26.00	ORAP	Concession 3 Road	Line 4 Road	Line 3 Road	1	0.833	ADEQ	Const	NONE	0.00
26.00	ORAQ	Concession 3 Road	0.3km South of Line 2 Road	Line 2 Road	1	0.300	ADEQ	Const	NONE	0.00
26.00	ORAR	Concession 3 Road	Line 2 Road	0.5km South of Line 1 Road	1	0.341	ADEQ	Const	NONE	0.00
26.00	ORAS	Concession 3 Road	Line 1 Road	East and West Line	1	0.911	ADEQ	Const	NONE	0.00
26.00	90	Line 1 Road	0.2km East of Townline Road	Concession 7 Road	851	0.839	ADEQ	Const	NONE	0.00
26.00	690	Concession 2 Road	Arnold Road	Line 8 Road	1,592	0.157	ADEQ	Const	NONE	0.00
25.00	ORAD	Line 8 Road	0.3km West of Concession 7 Road	Townline Road	1	0.739	ADEQ	Const	NONE	0.00
25.00	ORAN	Concession 3 Road	Line 6 Road	Line 5 Road	1	0.850	ADEQ	Const	NONE	0.00
25.00	ORAL	Concession 3 Road	0.3km North of Line 8 Road	Line 7 Road	1	0.538	ADEQ	Const	NONE	0.00
24.00	4805	King Street	Cottage Street	Paffard Street	1,636	0.295	ADEQ	Const	NONE	0.00
24.00	ORAY	McNab Road	Regional Road 55 - Niagara Stone Road	83- Carleton Street	1	2.062	ADEQ	Const	NONE	0.00
24.00	880	Concession 6 Road	Line 7 Road	Line 6 Road	1,471	0.836	ADEQ	Const	NONE	0.00
23.00	850	Concession 6 Road	Niagara Falls Boundary	Warner Road	2,300	0.365	ADEQ	Const	NONE	0.00
23.00	735	Concession 2 Road	Line 1 Road	East and West Line	2,255	0.915	ADEQ	Const	NONE	0.00
22.00	24230	Stewart Road	Lakeshore Road	End	10	0.815	ADEQ	Const	NONE	0.00
22.00	1110	Niven Road	87- Lakeshore Road	350m South of 87 Lakeshore Road	1,002	0.350	ADEQ	Const	NONE	0.00
22.00	ORAT	Tanbark Road	Line 8 Road	Line 9 Road	1	0.826	ADEQ	Const	NONE	0.00
21.00	180	Line 2 Road	Townline Road	Concession 7 Road	600	1.046	ADEQ	Const	NONE	0.00
21.00	ORAI	Line 9 Road	Tanbark Road	0.1km West of 100- Four Mile Creek Road	1	0.614	ADEQ	Const	NONE	0.00
21.00	705	Concession 2 Road	Line 6 Road	Line 5 Road	1,340	0.835	ADEQ	Const	NONE	0.00
20.00	725	Concession 2 Road	Line 3 Road	Line 2 Road	1,572	0.829	ADEQ	Const	NONE	0.00
20.00	730	Concession 2 Road	Line 2 Road	Line 1 Road	1,575	0.834	ADEQ	Const	NONE	0.00
20.00	785	Concession 4 Road	Line 2 Road	Line 3 Road	1,303	0.825	ADEQ	Const	NONE	0.00
19.00	265	Line 3 Road	Regional Road 100 - Four Mile Creek Road	Concession 4 Road	1,831	0.489	ADEQ	Const	NONE	0.00
19.00	625	Concession 1 Road	Line 8 Road (West)	Line 7 Road	610	0.834	ADEQ	Const	NONE	0.00
19.00	405	Eastchester Avenue	Stewart Road	0.06km West of 55- Niagara Stone Road	175	0.869	ADEQ	Const	NONE	0.00
18.00	185	Line 2 Road	Concession 7 Road	Concession 6 Road	600	0.978	ADEQ	Const	NONE	0.00
18.00	4475	John Street West	Simcoe Street	Gate Street	1,445	0.144	ADEQ	Const	NONE	0.00
18.00	4480	John Street West	Gate Street	Victoria Street	1,800	0.149	ADEQ	Const	NONE	0.00
18.00	ORAE	Line 8 Road	Concession 6 Road	0.61km West of Concession 6 Road	1	0.679	ADEQ	Const	NONE	0.00
18.00	ORAF	Line 8 Road	0.55km East of Concession 6 Road	0.1km West of Concession 5 Road	1	0.361	ADEQ	Const	NONE	0.00
18.00	ORAG	Line 8 Road	Concession 5 Road	0.2km West of Tanbark Road	1	0.869	ADEQ	Const	NONE	0.00
17.00	4030	Delater Street	Turntable Road	Melville Street	1,500	0.102	ADEQ	Const	NONE	0.00
15.00	975	Townline Road	81- York Road	Queenston Road	541	0.799	ADEQ	Const	NONE	0.00
14.00	150	Line 1 Road	Concession 2 Road	Concession 1 Road	850	1.114	ADEQ	Const	NONE	0.00
14.00	285	Line 3 Road	Concession 1 Road	Niagara River Parkway	815	0.799	ADEQ	Const	NONE	0.00
14.00	260	Line 3 Road	Concession 6 Road	Regional Road 100 - Four Mile Creek Road	1,379	1.542	ADEQ	Const	NONE	0.00
14.00	215	Line 2 Road	Annmarie Drive	Concession 4 Road	1,761	0.196	ADEQ	Const	NONE	0.00
14.00	295	Line 4 Road	0.1km East of Concession 7 Road	Concession 6 Road	140	0.884	ADEQ	Const	NONE	0.00

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14.00	5385	Village Drive, NOTL	Niven Road	Garrison Village Drive	1,600	0.078	ADEQ	Const	NONE	0.00
14.00	4025	Delater Street	Ball Street	Turntable Road	640	0.060	ADEQ	Const	NONE	0.00
14.00	425	Line 7 Road	Concession 6 Road	Concession 5 Road	322	0.992	ADEQ	Const	NONE	0.00
14.00	4525	Anne Street	Simcoe Street	Gate Street	650	0.148	ADEQ	Const	NONE	0.00
13.00	5395	Garrison Village Drive	Colonel Butler Crescent	Westgate Drive	1,500	0.152	ADEQ	Const	NONE	0.00
13.00	50	East and West Line	Concession 2 Road	Niagara Street	3,350	0.451	ADEQ	Const	NONE	0.00
13.00	4470	John Street West	55- Mississauga Street	Simcoe Street	1,488	0.151	ADEQ	Const	NONE	0.00
13.00	345	Line 5 Road	Concession 3 Road	Concession 2 Road	350	1.024	ADEQ	Const	NONE	0.00
13.00	840	Concession 5 Road	Line 7 Road	0.4km North of Line 7 Road	10	0.400	ADEQ	Const	NONE	0.00
13.00	875	Concession 6 Road	Line 8 Road	Line 7 Road	1,480	0.830	ADEQ	Const	NONE	0.00
12.00	155	Line 1 Road	Concession 1 Road	Niagara River Parkway	170	1.058	ADEQ	Const	NONE	0.00
12.00	210	Line 2 Road	Hope Avenue	Annmarie Drive	1,700	0.100	ADEQ	Const	NONE	0.00
12.00	5040	Simcoe Street	Mary Street	William Street	400	0.160	ADEQ	Const	NONE	0.00
12.00	4700	Charlotte Street	Paffard Street	Weatherstone Court	1,300	0.021	ADEQ	Const	NONE	0.00
12.00	4695	Charlotte Street	The Promenade (North)	Paffard Street	1,335	0.138	ADEQ	Const	NONE	0.00
12.00	35	East and West Line	Concession 4 Road	Regional Road 55 - Niagara Stone Road	3,720	0.384	ADEQ	Const	NONE	0.00
12.00	3235	Loretta Drive	Bianca Drive	Concession 4 Road	1,500	0.114	ADEQ	Const	NONE	0.00
12.00	3115	Andres Street	Henry Street	Line 2 Road	847	0.201	ADEQ	Const	NONE	0.00
12.00	4040	Front Street	Gate Street	Victoria Street	800	0.149	ADEQ	Const	NONE	0.00
12.00	4160	Queen Street	Simcoe Street	Gate Street	4,056	0.148	ADEQ	Const	NONE	0.00
12.00	4540	Anne Street	88m East of Victoria St.	King Street	600	0.210	ADEQ	Const	NONE	0.00
12.00	900	Concession 6 Road	0.1km South of Line 3 Road	Line 3 Road	1,600	0.101	ADEQ	Const	NONE	0.00
12.00	885	Concession 6 Road	Line 6 Road	Line 5 Road	1,608	0.833	ADEQ	Const	NONE	0.00
12.00	890	Concession 6 Road	Line 5 Road	Line 4 Road	1,600	0.839	ADEQ	Const	NONE	0.00
12.00	895	Concession 6 Road	Line 4 Road	0.1km South of Line 3 Road	1,600	0.736	ADEQ	Const	NONE	0.00
11.00	4705	Charlotte Street	Weatherstone Court	Christopher Street	1,250	0.103	ADEQ	Const	NONE	0.00
11.00	4710	Charlotte Street	Christopher Street	John Street East	1,131	0.180	ADEQ	Const	NONE	0.00
11.00	5125	Butler Street	Centre Street	Gage Street	150	0.148	ADEQ	Const	NONE	0.00
11.00	5390	Garrison Village Drive	87- Lakeshore Road	Colonel Butler Crescent	1,500	0.065	ADEQ	Const	NONE	0.00
11.00	4515	Anne Street	55- Mississauga Street	Start of Culdesac	30	0.081	ADEQ	Const	NONE	0.00
11.00	4580	Niagara Street	Rye Street	Green Street	918	0.279	ADEQ	Const	NONE	0.00
11.00	4420	William Street	Gate Street	Victoria Street	200	0.148	ADEQ	Const	NONE	0.00
11.00	3145	Field Road	Regional Road 100 - Four Mile Creek Road	Elden Street	449	0.197	ADEQ	Const	NONE	0.00
11.00	3245	Casselman Boulevard	Loretta Drive	Line 1 Road	1,500	0.128	ADEQ	Const	NONE	0.00
11.00	835	Concession 5 Road	Line 8 Road	Line 7 Road	200	0.837	ADEQ	Const	NONE	0.00
11.00	765	Tanbark Road	South End Cul De Sac	Warner Road	909	0.906	ADEQ	Const	NONE	0.00
11.00	912	Concession 6 Road	Cross Culvert	Line 2 Road	1,140	0.273	ADEQ	Const	NONE	0.00
10.00	1160	Warner Road	Tanbark Road	Regional Road 100 - Four Mile Creek Road	563	0.459	ADEQ	Const	NONE	0.00
10.00	230	Line 2 Road	Concession 2 Road	Concession 1 Road	269	1.115	ADEQ	Const	NONE	0.00
10.00	5495	Colonel Butler Crescent	Garrison Village Drive	Northgate Circle	500	0.108	ADEQ	Const	NONE	0.00
10.00	5510	Colonel Butler Crescent	Upper Canada Drive	McFarland Gate	500	0.073	ADEQ	Const	NONE	0.00
10.00	4690	Charlotte Street	James Street	The Promenade (North)	1,005	0.075	ADEQ	Const	NONE	0.00
10.00	320	Larkin Road	Concession 2 Road	Concession 1 Road	100	1.113	ADEQ	Const	NONE	0.00
10.00	3040	Frontier Drive	Hearth Court	Bordeaux Drive	451	0.113	ADEQ	Const	NONE	0.00
10.00	800	Concession 4 Road	Loretta Drive	Line 1 Road	920	0.128	ADEQ	Const	NONE	0.00
9.00	09040	Garrison Village Drive	Samuel Street	Garrison Village Drive	600	0.055	NOW	Const	NONE	0.00
9.00	1155	Warner Road	0.3km West of Tanbark Road	Tanbark Road	300	0.301	ADEQ	Const	NONE	0.00
9.00	205	Line 2 Road	Regional Road 100 - Four Mile Creek Road	Hope Avenue	1,405	0.511	ADEQ	Const	NONE	0.00

Total Needs Summary by Improvement Type

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Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
9.00	125	Penner Street	Elden Street	Regional Road 55 - Niagara Stone Road	2,500	0.272	ADEQ	Const	NONE	0.00
9.00	130	Line 1 Road	Regional Road 55 - Niagara Stone Road	Casselman Boulevard	1,810	0.293	ADEQ	Const	NONE	0.00
9.00	235	Line 2 Road	Concession 1 Road	Niagara River Parkway	261	0.986	ADEQ	Const	NONE	0.00
9.00	245	Line 3 Road	Concession 7 Road	0.1km West of 55- Niagara Stone Road	100	0.704	ADEQ	Const	NONE	0.00
9.00	4680	Charlotte Street	The Promenade (South)	Flynn Street	1,250	0.150	ADEQ	Const	NONE	0.00
9.00	4685	Charlotte Street	Flynn Street	James Street	1,250	0.123	ADEQ	Const	NONE	0.00
9.00	5500	Colonel Butler Crescent	Northgate Circle	Loyalist Court	500	0.237	ADEQ	Const	NONE	0.00
9.00	5505	Colonel Butler Crescent	Loyalist Court	Upper Canada Drive	500	0.112	ADEQ	Const	NONE	0.00
9.00	3105	Cherry Street	Andres Street	Henry Street	500	0.105	ADEQ	Const	NONE	0.00
9.00	3110	Andres Street	Cherry Street	Henry Street	400	0.182	ADEQ	Const	NONE	0.00
9.00	3185	Diana Drive	Concession 4 Road	Bianca Drive	800	0.128	ADEQ	Const	NONE	0.00
9.00	325	Line 5 Road	Concession 7 Road	Concession 6 Road	80	0.940	ADEQ	Const	NONE	0.00
9.00	3225	Loretta Drive	Fisher Drive	Casselman Boulevard	1,000	0.102	ADEQ	Const	NONE	0.00
9.00	3230	Loretta Drive	Casselman Boulevard	Bianca Drive	700	0.086	ADEQ	Const	NONE	0.00
9.00	4210	Johnson Street	Palatine Place	Newark Street	300	0.147	ADEQ	Const	NONE	0.00
9.00	4215	Johnson Street	Newark Street	Nassau Street	329	0.147	ADEQ	Const	NONE	0.00
9.00	985	Townline Road	0.15 North of Queenston Road	Martin Road	80	0.135	ADEQ	Const	NONE	0.00
8.00	240	Line 3 Road	Townline Road	Concession 7 Road	100	1.043	ADEQ	Const	NONE	0.00
8.00	27449	Tulip Tree Road	Turlip Tree Road	Hickory Avenue	95	0.094	ADEQ	Const	NONE	0.00
8.00	120	Penner Street	Four Mile Creek Road	Elden Street	1,400	0.287	ADEQ	Const	NONE	0.00
8.00	09042	Samuel Street	Garrison Village Drive	Garrison Village Drive	600	0.025	ADEQ	Const	NONE	0.00
8.00	55	East and West Line	Niagara Street	Concession 1 Road	1,306	0.663	ADEQ	Const	NONE	0.00
8.00	585	Queenston Road	Semi-Urban Section (St. David's)	Regional Road 81- York Road	850	0.302	ADEQ	Const	NONE	0.00
8.00	4750	Park Court	John Street East	John Street East	220	0.331	ADEQ	Const	NONE	0.00
8.00	4910	Victoria Street	Simcoe Street	Anne Street	250	0.379	ADEQ	Const	NONE	0.00
8.00	4220	Johnson Street	Nassau Street	Dorchester Street	333	0.146	ADEQ	Const	NONE	0.00
8.00	4035	Front Street	Simcoe Street	Gate Street	800	0.145	ADEQ	Const	NONE	0.00
8.00	3220	Loretta Drive	Fisher Drive	Fisher Drive	800	0.537	ADEQ	Const	NONE	0.00
8.00	3160	Hope Avenue	Line 2 Road	Raiana Drive	457	0.174	ADEQ	Const	NONE	0.00
8.00	4390	William Street	Chautauqua Amphitheatre	Nassau Street	428	0.277	ADEQ	Const	NONE	0.00
8.00	4560	Paffard Street	Rye Street	Charlotte Street	350	0.292	ADEQ	Const	NONE	0.00
7.00	10060	Creekside Drive	Red Haven Drive	Four Mile Creek Road	942	0.230	ADEQ	Const	NONE	0.00
7.00	1030	Irvine Road	Scott Street	Church Road	75	1.097	ADEQ	Const	NONE	0.00
7.00	1200	Stevens Drive	Niagara-on-the-Green Boulevard	Cole Crescent	400	0.056	ADEQ	Const	NONE	0.00
7.00	1205	Stevens Drive	Cole Crescent	Cole Crescent	400	0.189	ADEQ	Const	NONE	0.00
7.00	1215	Cole Crescent	Niagara-on-the-Green Boulevard	Robertson Road	450	0.252	ADEQ	Const	NONE	0.00
7.00	1220	Cole Crescent	Robertson Road	Stevens Drive	400	0.065	ADEQ	Const	NONE	0.00
7.00	1225	Cole Crescent	Stevens Drive	Stevens Drive	350	0.360	ADEQ	Const	NONE	0.00
7.00	175	Scott Street	Irvine Road	Townline Road	461	0.910	ADEQ	Const	NONE	0.00
7.00	24118	Steele Road	0.35km West of Four Mile Creek Road	End	50	0.273	ADEQ	Const	NONE	0.00
7.00	4965	Gate Street	Anne Street	John Street East	200	0.147	ADEQ	Const	NONE	0.00
7.00	4895	Regent Street	Johnson Street	Queen Street	745	0.155	ADEQ	Const	NONE	0.00
7.00	4765	Rye Street	Flynn Street	Paffard Street	200	0.204	ADEQ	Const	NONE	0.00
7.00	4672	Charlotte Street	Campbell Street	Harmony Drive	1,200	0.053	ADEQ	Const	NONE	0.00
7.00	60	East and West Line	Concession 1 Road	Niagara River Parkway	1,719	0.868	ADEQ	Const	NONE	0.00
7.00	5515	Colonel Butler Crescent	McFarland Gate	Laura Secord Place	500	0.117	ADEQ	Const	NONE	0.00
7.00	5520	Colonel Butler Crescent	Laura Secord Place	Merritt Circle	500	0.130	ADEQ	Const	NONE	0.00
7.00	4590	Niagara Street	Charlotte Street	0.13km South of Charlotte Street	3,079	0.139	ADEQ	Const	NONE	0.00

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7.00	4360	Centre Street	Butler Street	Mississagua Street	143	0.155	ADEQ	Const	NONE	0.00
7.00	3180	Raiana Drive	Hope Avenue	South End Cul De Sac	100	0.195	ADEQ	Const	NONE	0.00
7.00	4165	Queen Street	Gate Street	Victoria Street	6,500	0.150	ADEQ	Const	NONE	0.00
7.00	4170	Queen Street	Victoria Street	Regent Street	6,500	0.147	ADEQ	Const	NONE	0.00
7.00	4175	Queen Street	Regent Street	King Street	8,000	0.152	ADEQ	Const	NONE	0.00
6.00	30088	Anne Street	Anne Street	End	20	0.062	ADEQ	Const	NONE	0.00
6.00	135	Line 1 Road	Casselman Boulevard	Concession 4 Road	973	0.202	ADEQ	Const	NONE	0.00
6.00	10180	Four Mile Creek Road	Field Road	Penner Street	4,500	0.196	ADEQ	Const	NONE	0.00
6.00	10055	Creekside Drive	Bunny Glen Drive	Red Haven Drive	600	0.079	ADEQ	Const	NONE	0.00
6.00	5380	Bay Berry Lane	Bay Berry Lane (North)	East End Cul de sac	225	0.237	ADEQ	Const	NONE	0.00
6.00	5485	Northgate Circle	Colonel Butler Crescent	South End Cul De Sac	100	0.167	ADEQ	Const	NONE	0.00
6.00	5490	Loyalist Court	Colonel Butler Crescent	West End Cul De Sac	100	0.151	ADEQ	Const	NONE	0.00
6.00	5475	Southgate Circle	Upper Canada Drive	North End Cul De Sac	100	0.121	ADEQ	Const	NONE	0.00
6.00	4760	Rye Street	Cottage Street	Flynn Street	200	0.113	ADEQ	Const	NONE	0.00
6.00	3135	Elden Street	Field Road	Penner Street	400	0.166	ADEQ	Const	NONE	0.00
6.00	4405	William Street	Butler Street	Mississagua Street	486	0.154	ADEQ	Const	NONE	0.00
6.00	795	Concession 4 Road	Diana Drive	Loretta Drive	1,366	0.349	ADEQ	Const	NONE	0.00
6.00	770	Tanbark Road	Warner Road	Regional Road 81- York Road	650	0.157	ADEQ	Const	NONE	0.00
5.00	09127	Lakeshore Road	Townline Road	Lakeshore Road	50	0.056	ADEQ	Const	NONE	0.00
5.00	1175	Johanna Drive	Regional Road 100 - Four Mile Creek Road	West End Cul De Sac	20	0.089	ADEQ	Const	NONE	0.00
5.00	4675	Charlotte Street	Harmony Drive	The Promenade (South)	1,250	0.157	ADEQ	Const	NONE	0.00
5.00	5465	Upper Canada Drive	Southgate Circle	Confederation Drive	60	0.044	ADEQ	Const	NONE	0.00
5.00	5425	Westgate Drive	Garrison Village Drive	West End	100	0.047	ADEQ	Const	NONE	0.00
5.00	555	Queenston Road	Martin Road	Townline Road	1,222	0.671	ADEQ	Const	NONE	0.00
5.00	4555	Paffard Street	King Street	Rye Street	249	0.080	ADEQ	Const	NONE	0.00
5.00	3150	Field Road	Elden Street	Regional Road 55 - Niagara Stone Road	400	0.104	ADEQ	Const	NONE	0.00
5.00	3155	Lorraine Street	Regional Road 100 - Four Mile Creek Road	East End Cul de sac	1,500	0.340	ADEQ	Const	NONE	0.00
5.00	3190	Diana Drive	Bianca Drive	Annmarie Drive	150	0.048	ADEQ	Const	NONE	0.00
5.00	3240	Fisher Drive	Loretta Drive	Loretta Drive	200	0.230	ADEQ	Const	NONE	0.00
5.00	4145	Queen Street	Dorchester Street	Butler Street	1,500	0.156	ADEQ	Const	NONE	0.00
5.00	4150	Queen Street	Butler Street	Mississagua Street	1,781	0.153	ADEQ	Const	NONE	0.00
5.00	4283	Gage Street	Palatine Place	Nassau Street	300	0.293	ADEQ	Const	NONE	0.00
5.00	9020	Griffiths Gate	Wright Crescent	Glendale Avenue East	1,077	0.074	ADEQ	Const	NONE	0.00
5.00	ORAB	Line 4 Road	Niagara River Parkway	Concession 1 Road	10	1.062	ADEQ	Const	NONE	0.00
4.00	5421	Garrison Village Drive	Samuel Street	Elizabeth Street	600	0.042	NOW	Const	NONE	0.00
4.00	10170	Four Mile Creek Road	Niagara Stone Road	Field Road	2,643	0.306	ADEQ	Const	NONE	0.00
4.00	2115	Queenston Street	Kent Street	Clarence Street	500	0.088	ADEQ	Const	NONE	0.00
4.00	5422	Garrison Village Drive	Elizabeth Street	Colonel Cohoe Street	1,200	0.110	ADEQ	Const	NONE	0.00
4.00	5525	Colonel Butler Crescent	Merritt Circle	25m North of Cooley Crescent	500	0.067	ADEQ	Const	NONE	0.00
4.00	4670	Charlotte Street	Niagara Street	Harmony Drive	1,200	0.105	ADEQ	Const	NONE	0.00
4.00	4815	King Street	Anne Street	John Street	1,954	0.150	ADEQ	Const	NONE	0.00
4.00	5005	Gate Street	Prideaux Street	Front Street	600	0.148	ADEQ	Const	NONE	0.00
4.00	4130	Queen Street	Palatine Place	Newark Street	1,147	0.199	ADEQ	Const	NONE	0.00
4.00	4135	Queen Street	Newark Street	Nassau Street	1,100	0.149	ADEQ	Const	NONE	0.00
4.00	4140	Queen Street	Nassau Street	Dorchester Street	926	0.146	ADEQ	Const	NONE	0.00
4.00	4105	Prideaux Street	Regent Street	King Street	817	0.150	ADEQ	Const	NONE	0.00
4.00	4110	Byron Street	King Street	Wellington Street	1,198	0.309	ADEQ	Const	NONE	0.00
4.00	3120	Henegan Road	Regional Road 55 - Niagara Stone Road	Walker Road	800	0.318	ADEQ	Const	NONE	0.00

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4.00	3045	Bordeaux Drive	Frontier Drive	Line 2 Road	783	0.221	ADEQ	Const	NONE	0.00
4.00	460	Line 8 Road	Concession 7 Road	0.3km West of Concession 7 Road	10	0.300	ADEQ	Const	NONE	0.00
4.00	790	Concession 4 Road	Line 2 Road	Diana Drive	543	0.365	ADEQ	Const	NONE	0.00
4.00	740	Concession 3 Road	81- York Road	Line 9 Road	773	0.822	ADEQ	Const	NONE	0.00
3.00	25771	Mulberry Lane	Niagara Stone Road	Copper Beach Boulevard	400	0.075	ADEQ	Const	NONE	0.00
3.00	28879	Pierpoint Drive	Summerhayes Drive	Line 2 Road	115	0.112	ADEQ	Const	NONE	0.00
3.00	29001	Angela Crescent	Chiara Way	Cannery Drive	360	0.357	ADEQ	Const	NONE	0.00
3.00	29005	Cannery Drive	Dominion Crescent	Dominion Crescent	570	0.163	ADEQ	Const	NONE	0.00
3.00	29006	Cannery Drive	Dominion Crescent	Concession 3 Road	570	0.254	ADEQ	Const	NONE	0.00
3.00	29007	Dominion Crescent	Cannery Drive	Cannery Drive	302	0.302	ADEQ	Const	NONE	0.00
3.00	3010	Homestead Drive	Harvest Drive	Plantation Drive	400	0.104	ADEQ	Const	NONE	0.00
3.00	3005	Homestead Drive	Line 1 Road	Harvest Drive	785	0.097	ADEQ	Const	NONE	0.00
3.00	3015	Homestead Drive	Plantation Drive	Grange Crescent	308	0.094	ADEQ	Const	NONE	0.00
3.00	3020	Homestead Drive	Grange Crescent	Frontier Drive	400	0.072	ADEQ	Const	NONE	0.00
3.00	11090	Kirby Street	Brock Street	Macdonell Road	158	0.158	ADEQ	Const	NONE	0.00
3.00	11230	Keith Crescent	Wright Crescent	Wright Crescent	410	0.406	ADEQ	Const	NONE	0.00
3.00	11160	Garrison Village Drive	Garrison Village Drive	Brock Street	500	0.086	ADEQ	Const	NONE	0.00
3.00	5270	Oak Drive	87- Lakeshore Road	Chautauqua Amphitheatre	550	0.397	ADEQ	Const	NONE	0.00
3.00	4715	Wellington Street	Castlereagh Street	Platoff Street	800	0.150	ADEQ	Const	NONE	0.00
3.00	4720	Wellington Street	Platoff Street	Queens Parade- Picton	800	0.154	ADEQ	Const	NONE	0.00
3.00	4780	Davy Street	Castlereagh Street	Platoff Street	150	0.145	ADEQ	Const	NONE	0.00
3.00	4810	King Street	Paffard Street	Anne Street	1,700	0.147	ADEQ	Const	NONE	0.00
3.00	5530	Merritt Circle	Colonel Butler Crescent	East End Cul de sac	100	0.143	ADEQ	Const	NONE	0.00
3.00	5535	Laura Secord Place	Colonel Butler Crescent	East End Cul de sac	100	0.153	ADEQ	Const	NONE	0.00
3.00	5560	Colonel Cohoe Street	Niven Road	Garrison Village Drive	180	0.203	ADEQ	Const	NONE	0.00
3.00	463	Line 8 Road	Concession 6 Road	0.55km East of Concession 6 Road	250	0.550	ADEQ	Const	NONE	0.00
3.00	4490	John Street West	Regent Street	King Street	1,800	0.150	ADEQ	Const	NONE	0.00
3.00	3065	Grange Crescent	Homestead Drive	Autumn Place	400	0.294	ADEQ	Const	NONE	0.00
3.00	3125	Walker Road	Henegan Road	West End Cul De Sac	400	0.273	ADEQ	Const	NONE	0.00
3.00	4115	Byron Street	Wellington Street	Melville Street	650	0.102	ADEQ	Const	NONE	0.00
3.00	4095	Prideaux Street	Gate Street	Victoria Street	400	0.150	ADEQ	Const	NONE	0.00
3.00	4100	Prideaux Street	Victoria Street	Regent Street	430	0.147	ADEQ	Const	NONE	0.00
3.00	905	Concession 6 Road	Line 3 Road	Regional Road 55 - Niagara Stone Road	839	0.071	ADEQ	Const	NONE	0.00
3.00	9060	Street B	Homer Road	East End	50	0.235	ADEQ	Const	NONE	0.00
3.00	977	Westwood Court	Townline Road	East End	500	0.381	ADEQ	Const	NONE	0.00
3.00	9088	Chestnut Avenue	Hickory Avenue	Bend	200	0.083	ADEQ	Const	NONE	0.00
3.00	9090	Chestnut Avenue	Tulip Tree Road	Chestnut Avenue	200	0.193	ADEQ	Const	NONE	0.00
3.00	910	Concession 6 Road	55- Mississauga Street	Cross Culvert	1,140	0.386	ADEQ	Const	NONE	0.00
3.00	30073	Paradise Grove	Annmarie Drive	Paradise Grove	90	0.086	1-5	Const	NONE	0.00
2.00	29771	Kenmir Avenue	Hickory Avenue	Kenmir Avenue	300	0.306	ADEQ	Const	NONE	0.00
2.00	29009	Chiara Way	Line 9 Road	Angela Crescent	500	0.081	ADEQ	Const	NONE	0.00
2.00	29096	Perez Road	Rampart Street	Garrison Village Drive	120	0.120	ADEQ	Const	NONE	0.00
2.00	29097	Perez Road	Rampart Street	Niven Road	250	0.095	ADEQ	Const	NONE	0.00
2.00	29112	Brock Street	Macdonell Road	Murray Street	500	0.060	ADEQ	Const	NONE	0.00
2.00	29003	Cannery Drive	Angela Crescent	Angela Crescent	570	0.089	ADEQ	Const	NONE	0.00
2.00	29004	Cannery Drive	Angela Crescent	Dominion Crescent	570	0.080	ADEQ	Const	NONE	0.00
2.00	29000	Angela Crescent	Cannery Drive	Chiara Way	500	0.111	ADEQ	Const	NONE	0.00
2.00	29114	Macdonell Road	Cooley Lane	Murray Street	400	0.146	ADEQ	Const	NONE	0.00

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2.00	29115	Brock Street	25m North of Cooley Crescent	Cooley Lane	500	0.025	ADEQ	Const	NONE	0.00
2.00	29116	Macdonell Road	Brock Street	Cooley Lane	400	0.041	ADEQ	Const	NONE	0.00
2.00	30034	Rampart Street	Colonel Cohoe Street	Moseby Street	100	0.073	ADEQ	Const	NONE	0.00
2.00	30035	Moseby Street	Rampart Street	Niven Road	95	0.095	ADEQ	Const	NONE	0.00
2.00	28880	Gossen Drive	Pierpoint Drive	End	90	0.091	ADEQ	Const	NONE	0.00
2.00	28881	Summerhayes Drive	Pierpoint Drive	End	90	0.092	ADEQ	Const	NONE	0.00
2.00	28967	Hickory Avenue	West End	Kenmir Avenue	180	0.189	ADEQ	Const	NONE	0.00
2.00	28877	Pierpoint Drive	Copper Beach Boulevard	Gossen Drive	115	0.113	ADEQ	Const	NONE	0.00
2.00	28999	Angela Crescent	Cannery Drive	Concession 3 Road	500	0.086	ADEQ	Const	NONE	0.00
2.00	25775	Copper Beech Boulevard	Mulberry Lane	Pierpoint Drive	300	0.141	ADEQ	Const	NONE	0.00
2.00	25663	Nelson Street	Ricardo Street	End	100	0.061	ADEQ	Const	NONE	0.00
2.00	24272	Annmarie Drive	Diana Drive	Paradise Grove	120	0.118	ADEQ	Const	NONE	0.00
2.00	2090	Queenston Street	Dee Road	Walnut Street	400	0.025	ADEQ	Const	NONE	0.00
2.00	2095	Queenston Street	Walnut Street	Highlander Street	450	0.188	ADEQ	Const	NONE	0.00
2.00	11130	Blackbird Street	Brock Street	Jordan Street	114	0.114	ADEQ	Const	NONE	0.00
2.00	11180	Macdonell Road	Norton Street	Kirby Street	129	0.129	ADEQ	Const	NONE	0.00
2.00	11240	Durham Way	Wright Crescent	Wright Crescent	120	0.121	ADEQ	Const	NONE	0.00
2.00	11200	Evergreen Lane	King Street	West End	130	0.131	ADEQ	Const	NONE	0.00
2.00	2100	Queenston Street	Highlander Street	Dumfries Street	400	0.089	ADEQ	Const	NONE	0.00
2.00	2105	Queenston Street	Dumfries Street	Partition Street	400	0.092	ADEQ	Const	NONE	0.00
2.00	2110	Queenston Street	Partition Street	Kent Street	400	0.088	ADEQ	Const	NONE	0.00
2.00	11110	Jordan Street	Blackbird Street	Norton Street	77	0.077	ADEQ	Const	NONE	0.00
2.00	11100	Brock Street	Norton Street	Kirby Street	500	0.080	ADEQ	Const	NONE	0.00
2.00	11060	Norton Street	Brock Street	Jordan Street	129	0.129	ADEQ	Const	NONE	0.00
2.00	11070	Murray Street	Brock Street	Macdonell Road	140	0.140	ADEQ	Const	NONE	0.00
2.00	11080	Brock Street	Kirby Street	Murray Street	500	0.055	ADEQ	Const	NONE	0.00
2.00	11030	Garrison Village Drive	Colonel Cohoe Street	Brock Street	500	0.039	ADEQ	Const	NONE	0.00
2.00	08388	Plantation Drive	129m West of Homestead Drive	West End	105	0.020	ADEQ	Const	NONE	0.00
2.00	10100	Paxton Lane	Goring Way	North End Cul De Sac	100	0.158	ADEQ	Const	NONE	0.00
2.00	10110	Goring Way	Paxton Lane	David Secord Drive	150	0.099	ADEQ	Const	NONE	0.00
2.00	10120	Goring Way	David Secord Drive	Glockner Lane	150	0.088	ADEQ	Const	NONE	0.00
2.00	10130	Goring Way	Glockner Lane	Paxton Lane	150	0.160	ADEQ	Const	NONE	0.00
2.00	10070	David Secord Drive	Four Mile Creek Road	Old Mill Lane	400	0.102	ADEQ	Const	NONE	0.00
2.00	10075	David Secord Drive	Old Mill Lane	Goring Way	400	0.083	ADEQ	Const	NONE	0.00
2.00	10080	Old Mill Lane	David Secord Drive	Goring Way	200	0.103	ADEQ	Const	NONE	0.00
2.00	10085	Paxton Lane	Old Mill Lane	Goring Way	200	0.078	ADEQ	Const	NONE	0.00
2.00	10090	Paxton Lane	Goring Way	Goring Way	150	0.311	ADEQ	Const	NONE	0.00
2.00	4673	Campbell Street	Charlotte Street	Green Street	100	0.142	ADEQ	Const	NONE	0.00
2.00	4865	Regent Street	0.05km South of John Street West	John Street West	150	0.045	ADEQ	Const	NONE	0.00
2.00	520	Line 9 Road	Regional Road 100 - Four Mile Creek Road	Concession 3 Road	150	0.340	ADEQ	Const	NONE	0.00
2.00	4120	Byron Street	Melville Street	Nelson Street	200	0.214	ADEQ	Const	NONE	0.00
2.00	4090	Prideaux Street	Simcoe Street	Gate Street	400	0.148	ADEQ	Const	NONE	0.00
2.00	3130	Walker Road	Henegan Road	East End	250	0.102	ADEQ	Const	NONE	0.00
2.00	3170	Annmarie Drive	Raiana Drive	North End	50	0.039	ADEQ	Const	NONE	0.00
2.00	3070	Autumn Place	Grange Crescent	South End Cul De Sac	100	0.106	ADEQ	Const	NONE	0.00
2.00	3075	Grange Crescent	Autumn Place	Homestead Drive	400	0.087	ADEQ	Const	NONE	0.00
2.00	3030	Frontier Drive	Homestead Drive	Cherry Street	400	0.120	ADEQ	Const	NONE	0.00
2.00	30311	Kenmir Avenue	Highland Lane	Tanbark Road	235	0.235	ADEQ	Const	NONE	0.00

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
2.00	4345	Hampton Court	Nassau Street	West End Cul De Sac	70	0.149	ADEQ	Const	NONE	0.00
2.00	9080	Hickory Avenue	Tanbark Road	Dyck Lane (P)	50	0.312	ADEQ	Const	NONE	0.00
2.00	9040	Haynes Court	Haynes Court	North End	100	0.214	ADEQ	Const	NONE	0.00
2.00	775	Tanbark Road	Regional Road 81- York Road	Stoneridge Crescent	250	0.241	ADEQ	Const	NONE	0.00
2.00	780	Tanbark Road	Stoneridge Crescent	200m N of Stoneridge Crescent	456	0.200	ADEQ	Const	NONE	0.00
1.00	08337	Harvest Drive	0.1 km West of Homestead	West End	40	0.039	ADEQ	Const	NONE	0.00
1.00	10140	Goring Way	David Lowrey Court	East End Cul de sac	60	0.097	ADEQ	Const	NONE	0.00
1.00	10150	Glockner Lane	Goring Way	West End Cul De Sac	20	0.143	ADEQ	Const	NONE	0.00
1.00	11040	Brock Street	Norton Street	Blackbird Street	72	0.072	ADEQ	Const	NONE	0.00
1.00	11120	Jordan Street	Garrison Village Drive	Blackbird Street	69	0.069	ADEQ	Const	NONE	0.00
1.00	11050	Norton Street	Jordan Street	Macdonell Road	56	0.056	ADEQ	Const	NONE	0.00
1.00	11190	Macdonell Road	Kirby Street	Murray Street	79	0.079	ADEQ	Const	NONE	0.00
1.00	24335	Rampart Street	Moseby Street	Perez Street	83	0.083	ADEQ	Const	NONE	0.00
1.00	25773	Mulberry Lane	Copper Beach Boulevard	End	80	0.077	ADEQ	Const	NONE	0.00
1.00	28878	Pierpoint Drive	Gossen Drive	Summerhayes Drive	80	0.081	ADEQ	Const	NONE	0.00
1.00	28969	Kenmir Avenue	Hickory Avenue	End	1	0.014	ADEQ	Const	NONE	0.00
1.00	28876	Pierpoint Drive	Copper Beach Boulevard	End	55	0.054	ADEQ	Const	NONE	0.00
1.00	30110	Woodbourne Court	South End Cul De Sac	Warner Road	80	0.081	ADEQ	Const	NONE	0.00
1.00	3025	Homestead Drive	Frontier Drive	West End Cul De Sac	40	0.050	ADEQ	Const	NONE	0.00
0.00	30074	Paradise Grove	Paradise Grove	End	60	0.058	ADEQ	Const	NONE	0.00
0.00	30052	Shaws Lane	Simcoe Street	37m North of Albion (Private Rd)	135	0.262	ADEQ	Const	NONE	0.00
0.00	30072	Paradise Grove	Annmarie Drive	Concession 4 Road	250	0.191	ADEQ	Const	NONE	0.00
0.00	30191	Millpond Road	Line 9 Road	Willow Lane	260	0.082	ADEQ	Const	NONE	0.00
0.00	30192	Millpond Road	Willow Lane	Mills Lane	180	0.181	ADEQ	Const	NONE	0.00
0.00	30193	Millpond Road	Millpond Road	Four Mile Creek Road	171	0.171	ADEQ	Const	NONE	0.00
0.00	24294	Annmarie Drive	0.048 km North of Raiana Drive	Paradise Grove	90	0.048	ADEQ	Const	NONE	0.00
0.00	515	Line 9 Road	Regional Road 100 - Four Mile Creek Road	0.1km West of 100- Four Mile Creek Road	5	0.101	ADEQ	Const	NONE	0.00
0.00	30295	Cottage Street	Shaw's Lane	King Street	300	0.170	ADEQ	Const	NONE	0.00
0.00	31122	Oakley Drive	Homestead Drive	Line 1 Road	375	0.375	ADEQ	Const	NONE	0.00
0.00	31123	Homestead Drive	Oakley Drive	Dead End	40	0.040	ADEQ	Const	NONE	0.00
0.00	31124	Homestead Drive	Concession 6 Road	Oakley Drive	300	0.290	ADEQ	Const	NONE	0.00
						100.835				0.00
BS										
58.00	860	Concession 6 Road	Highway 405 Overpass	81- York Road	2,300	0.455	NOW	Const	BS	365,192.90
57.00	855	Concession 6 Road	Warner Road	Highway 405 Overpass	2,300	0.445	NOW	Const	BS	384,021.32
39.00	1135	Warner Road	Concession 6 Road	West End Cul De Sac	200	1.134	NOW	Const	BS	563,594.03
37.00	1025	Townline Road	Lakeshore Road	North End	150	0.383	NOW	Const	BS	215,572.51
36.00	100	Line 1 Road	0.2km West of Concession 6 Road	Concession 6 Road	1,000	0.201	NOW	Const	BS	120,505.69
36.00	510	Martin Road	Queenston Road	Townline Road	150	0.733	NOW	Const	BS	291,224.02
35.00	1150	Warner Road	Concession 5 Road	0.3km West of Tanbark Road	576	0.781	NOW	Const	BS	430,099.14
34.00	920	Concession 6 Road	Line 1 Road	East and West Line	600	0.879	NOW	Const	BS	484,068.05
33.00	1105	Wall Road	Four Mile Creek Road	East End Cul de sac	431	1.186	NOW	Const	BS	653,133.91
33.00	615	Concession 1 Road	Line 9 Road	Arnold Road	485	0.675	NOW	Const	BS	371,724.61
32.00	1100	Hunter Road	Concession 4 Road	Regional Road 55 - Niagara Stone Road	415	1.152	NOW	Const	BS	634,410.00
32.00	360	Welland Avenue	Regional Road 88 - Stewart Road	East End	30	0.200	ADEQ	Const	BS	272,536.95
31.00	160	Scott Street	Read Road	Stewart Road	200	0.918	NOW	Const	BS	424,337.70
31.00	635	Concession 1 Road	Line 6 Road (East)	Line 6 Road (West)	735	0.275	1-5	Const	BS	151,443.36

Total Needs Summary by Improvement Type

Current Inspection Batch

Priority#	ID	Street Name	From	To	AADT	Length	TON	Imp. Class	Imp	Imp. Cost
30.00	1140	Warner Road	Concession 6 Road	East End Cul de sac	60	0.742	NOW	Const	BS	316,965.15
30.00	505	Arnold Road	Concession 1 Road	0.5km West of Concession 1 Road	30	0.500	ADEQ	Const	BS	681,342.38
28.00	410	Eastchester Avenue	0.06km West of 55- Niagara Stone Road	Regional Road 55 - Niagara Stone Road	175	0.060	NOW	Const	BS	36,147.41
28.00	415	Line 7 Road	Concession 7 Road	0.9km West of Concession 7 Road	20	0.891	ADEQ	Const	BS	1,214,152.12
28.00	760	Concession 3 Road	Line 1 Road	0.5km South of Line 1 Road	30	0.500	ADEQ	Const	BS	681,342.38
27.00	1130	Warner Road	Garner Road	East End Cul de sac	24	0.689	ADEQ	Const	BS	1,009,483.02
27.00	755	Concession 3 Road	Line 3 Road	0.5km North of Line 3 Road	30	0.533	ADEQ	Const	BS	726,310.98
27.00	590	Melrose Drive	Regional Road 61- Townline (Stamford) Road	Mallette Crescent	550	0.331	1-5	Const	BS	211,882.70
26.00	1120	Lakeshore Road	Niven Road	87- Lakeshore Road	50	0.443	NOW	Const	BS	204,772.98
26.00	305	Line 4 Road	Regional Road 100 - Four Mile Creek Road	0.1km East of 100- Four Mile Creek Road	300	0.101	NOW	Const	BS	48,609.82
26.00	990	Townline Road	Martin Road	House 499 Entrance	20	0.400	ADEQ	Const	BS	586,056.90
25.00	1110A	Niven Road	350m South of 87 Lakeshore Road	670m South of 87- Lakeshore Road	297	0.320	NOW	Const	BS	151,573.72
25.00	01513	Old Lakeshore Road	Lakeshore Road	Niven Road	50	0.401	NOW	Const	BS	185,358.84
25.00	290	Line 4 Road	Concession 7 Road	0.1km East of Concession 7 Road	140	0.101	NOW	Const	BS	56,096.21
25.00	610	Glenwood Crescent	Melrose Drive	North End	30	0.083	ADEQ	Const	BS	46,716.76
24.00	2005	Brittain Street	Niagara River Parkway	North End	100	0.082	NOW	Const	BS	46,565.82
24.00	745	Concession 3 Road	Line 8 Road	0.3km North of Line 8 Road	35	0.300	ADEQ	Const	BS	408,805.43
24.00	1095	Hunter Road	Four Mile Creek Road	Concession 4 Road	607	1.415	1-5	Const	BS	785,902.32
23.00	395	Line 6 Road	Concession 1 Road	Niagara River Parkway	257	1.018	NOW	Const	BS	474,439.20
23.00	398	Eastchester Avenue	House 153	House 165 Entrance	20	0.092	ADEQ	Const	BS	51,782.43
22.00	595	Melrose Drive	Mallette Crescent	Glenwood Crescent	300	0.371	NOW	Const	BS	223,523.80
22.00	420	Line 7 Road	Concession 7 Road	Concession 6 Road	100	0.900	NOW	Const	BS	426,301.08
22.00	750	Concession 3 Road	Line 5 Road	0.2km North of Line 5 Road	10	0.200	ADEQ	Const	BS	272,536.95
21.00	465	Line 8 Road	Concession 5 Road	0.1km West of Concession 5 Road	10	0.100	ADEQ	Const	BS	136,268.48
19.00	820	Concession 5 Road	Warner Road	Regional Road 81- York Road	140	0.426	NOW	Const	BS	205,027.60
19.00	500	Arnold Road	Concession 2 Road	0.05km East of Concession 2 Road	10	0.050	ADEQ	Const	BS	68,134.24
16.00	1110B	Niven Road	670m South of 87- Lakeshore Road	Village Drive, NOTL	297	0.611	6-10	Const	BS	289,411.06
						21.077				14,907,373.97
						261.257				68,480,652.26
						261.257				68,480,652.26

Appendix L: Inventory Manual References

TABLE F-1 ROAD DESIGN STANDARDS

RURAL ROAD STANDARDS

		50-199 AADT 200	200-399 AADT 300	400-999 AADT 400	1000-1999 AADT 500	2000-2999 AADT 600	3000-3999 AADT 700	4000+ AADT 800	4 lanes & Exp 4LN,EXP
Shw	Surface Width (m)	6.0	6.0	6.5	6.5	7.0	7.0	7.5	15.0
DOP	Shoulder Width (m)	1.5	1.5	1.5	2.5	2.5	3.0	3.0	3.0
DA	Hot Mix (mm)		*16	50	50	100	100	100	100
DB	Granular A (mm)	150	150	150	150	150	150	150	150
	Southern Ontario								
DB	*Granular B (mm)*								
	BS	150	150	150	150	150	150	150	150
	RW, REC,NC	300	300	450	450	450	450	450	450
	Northern Ontario								
DB	*Granular B (mm)*								
	BS	250	250	250	250	250	250	250	250
	RW, REC,NC	400	400	550	550	550	550	550	550
	Concrete Surface								
DC	Concrete (mm)	150	150	150	225	225	225	225	225
DB	Granular B (mm)	150	150	150	150	150	150	150	150

* Double Surface Treatment (DST) assumed to equal 16 mm of Hot Mix

Note: Class 100 rural roads are eligible for maintenance subsidy only.

SEMI-URBAN ROAD STANDARDS

		Local Roads		Collector Roads		Arterials
		Residential LR	Comm/Ind LCI	Residential CR	Comm/Ind CCI	All Lanes ART
Shw	Lane Width (m)	3.0	3.25	3.25	3.75	3.75
DOP	Shoulder Width (m)	1.5	1.5	2.5	2.5	3.0
DA	Hot Mix (mm)	50	50	50	100	100
DB	Granular A (mm)	150	150	150	150	150
	Southern Ontario					
DB	*Granular B (mm)*					
	BS	150	150	150	150	150
	RW, REC	250	300	300	450	450
	Northern Ontario					
DB	*Granular B (mm)*					
	BS	250	250	250	250	250
	RW, REC	350	400	400	550	550
	Concrete Surface					
DC	Concrete (mm)	150	150	225	225	225
DB	Granular B (mm)	150	150	150	150	150

URBAN ROAD STANDARDS

		Local Roads		Collector Roads		Arterials	Expressways
		Residential LR	Comm/Ind LCI	Residential CR	Comm/Ind CCI	All Lanes ART	All Lanes EXP
	Through Lane Width (m)	3.0	3.25	3.25	3.75	3.75	3.75
	Parking Lane Width (m)	2.5	2.5	2.5	2.5	3.0	3.0
	Curb Offset each side (m)	.5	.5	.5	.5	.5	.5
	Granular Base						
DOP	Hot Mix (mm)	100	100	100	150	150	150
DA	Granular A (mm)	150	150	150	150	150	150
DB	Granular B (mm)						
	Southern Ontario	300	300	300	300	450	450
	Northern Ontario	400	400	400	400	550	550
	Concrete Base						
DOP	Hot Mix (mm)	50	50	50	50	100	100
DC	Concrete (mm)	150	150	200	200	200	200
DB	Granular B (mm)	150	150	150	150	150	200
	Concrete Surface						
DC	Concrete (mm)	150	150	250	250	250	250
DB	Granular B (mm)	150	150	150	150	150	150

Note: Bench Mark Costs will not exceed the design standards specified in the above tables

Feb 1, 1991

F - 12

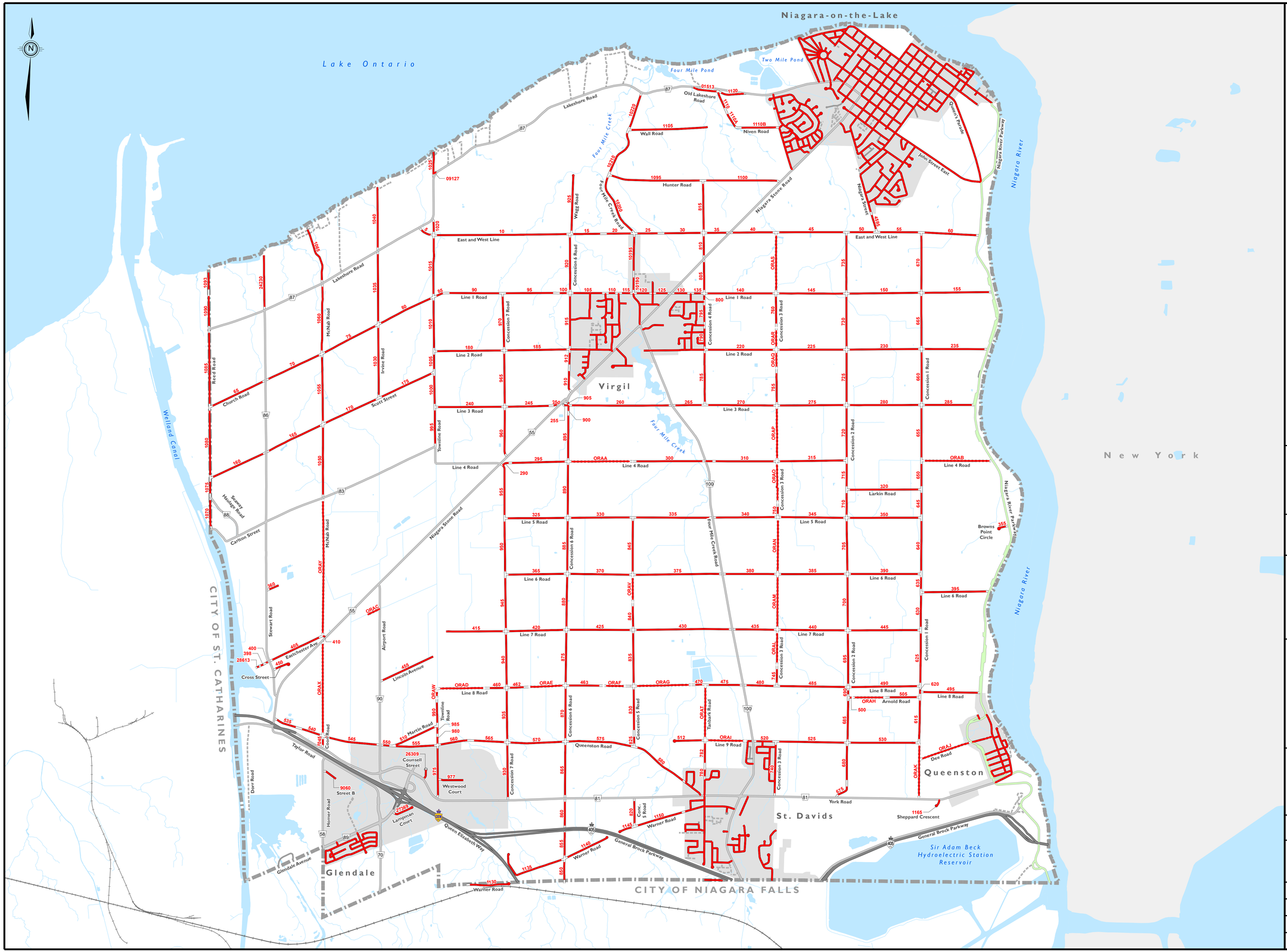
TABLE 93R - MINIMUM TOLERABLE SURFACE WIDTH - RURAL (metres)

	EXISTING CLASS									
	100	200	300	400	500	600	700	800	4LN	EXP
ROADWAY WIDTH	5.0	5.5	5.5	6.0	6.0	6.0	6.5	6.5	13.0	3.5/lane

TABLE 93SU - MINIMUM TOLERABLE SURFACE WIDTH - SEMI-URBAN and URBAN (metres)

	SEMI-URBAN		URBAN	
FUNCTIONAL CLASSIFICATION	2 Way (2W,2M)	1 Way (1W,1M)	2 Way (2W,2M)	1 Way (1W,1M)
2-lane Local Residential	5.0	5.0	5.5	5.5
2-lane Local Comm. & Ind.	5.5	5.5	6.0	6.0
2-lane Collector Residential	5.5	5.5	6.0	6.0
2-lane Collector Comm. & Ind.	6.0	6.0	6.5	6.5
2-lane Arterial	6.0	6.0	6.5	6.5
3-lane Local Comm. & Ind.	9.0	8.7	9.0	8.7
3-lane Collector Residential	9.0	8.7	9.0	8.7
3-lane Collector Comm. & Ind.	9.0	8.7	9.0	8.7
3-lane Arterial	9.0	9.0	9.5	9.5
4-lane Collector Residential	11.0	11.0	11.5	11.5
4-lane Collector Comm. & Ind.	12.0	12.0	12.5	12.5
4-lane Arterial	12.0	12.0	12.5	12.5
5-lane Arterial	15.0	15.0	15.5	15.5
6-lane Arterial	18.0	18.0	18.5	18.5
7-lane Arterial	21.5	21.5	22.0	22.0
8-lane Arterial	24.5	24.5	25.0	25.0
9-lane Arterial	27.5	27.5	28.0	28.0
Expressway	—	—	3.5/ln	3.5/ln

Appendix M: Thematic Maps



LEGEND

- ROAD INVENTORY SECTION

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

- PROVINCIAL HIGHWAY
- REGIONAL ROAD
- MUNICIPAL ROAD NOT INVENTORIED
- NIAGARA PARKS COMMISSION ROAD
- PRIVATE ROAD

OTHER FEATURES

- RAILWAY
- WATERCOURSE
- WATERBODY
- URBAN AREA
- MUNICIPAL BOUNDARY

DATA SOURCES

RAILWAY, WATERBODY & WATERCOURSE INFORMATION OBTAINED FROM LAND INFORMATION ONTARIO AND LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROAD INVENTORY SECTIONS

SUB TITILE:

RURAL AREA

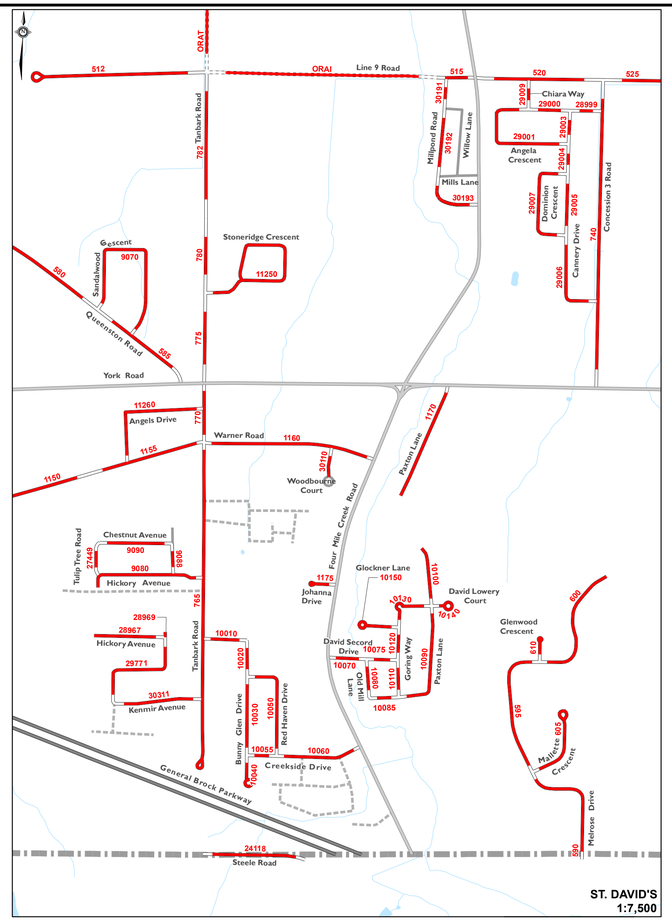
SCALE:

0 0.25 0.5 1 1.5 2

kilometers

1:25,000

PROJECT No: C14-0608		CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No: 1A
APPROVER R. ALBRIGHT	APPROVER ---	
DATE: 2023-12-11		SHEET No: 1 of 8



ST. DAVID'S
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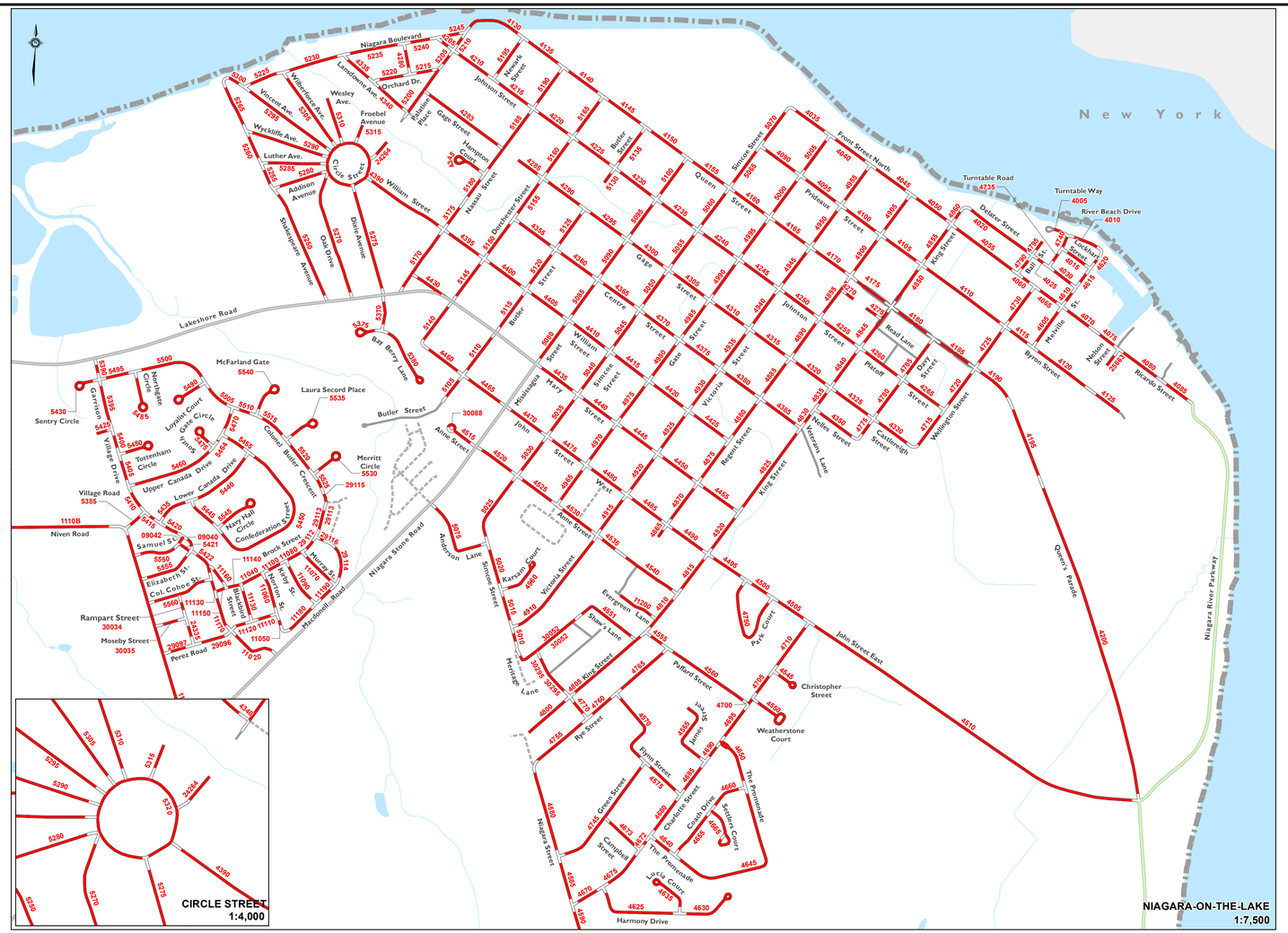

NIAGARA-ON-THE-LAKE
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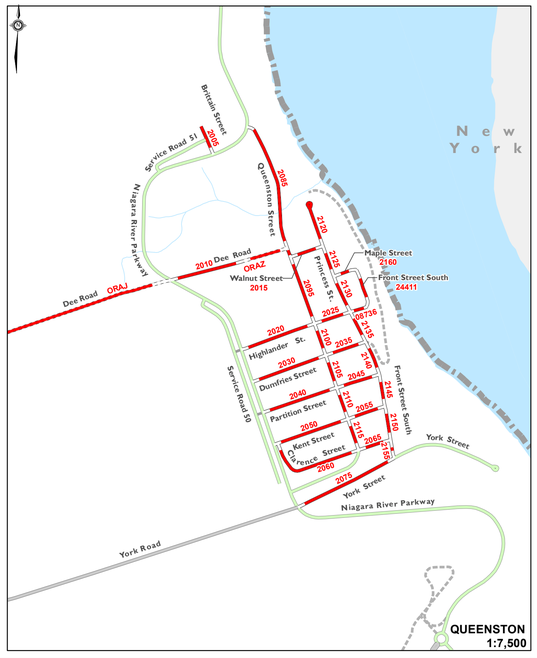
CIRCLE STREET
1:4,000



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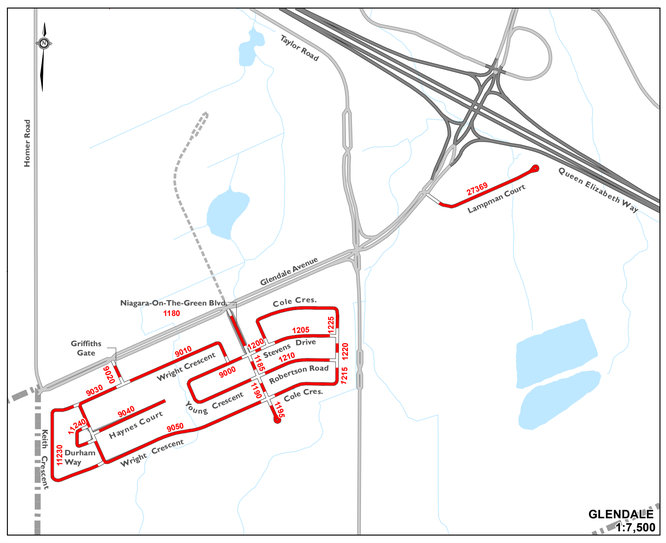

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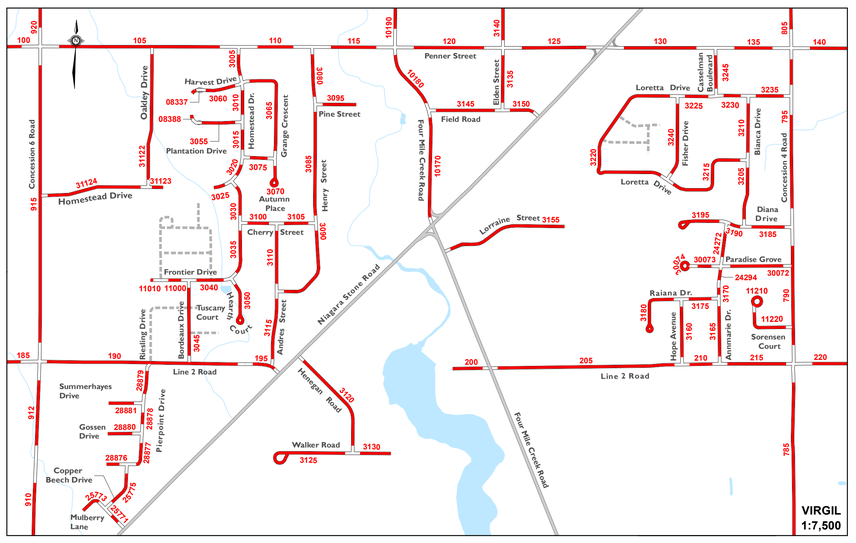

VIRGIL
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LEGEND

ROAD INVENTORY SECTION

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

PROVINCIAL HIGHWAY

REGIONAL ROAD

MUNICIPAL ROAD NOT INVENTORIED

NIAGARA PARKS COMMISSION ROAD

PRIVATE ROAD

OTHER FEATURES

RAILWAY

WATERCOURSE

WATERBODY

MUNICIPAL BOUNDARY

DATA SOURCES

RAILWAYS, WATERBODY & WATERCOURSE INFORMATION OBTAINED FROM LAND INFORMATION ONTARIO AND LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROAD INVENTORY SECTIONS

SUB TITILE:

URBAN DETAILS

SCALE:

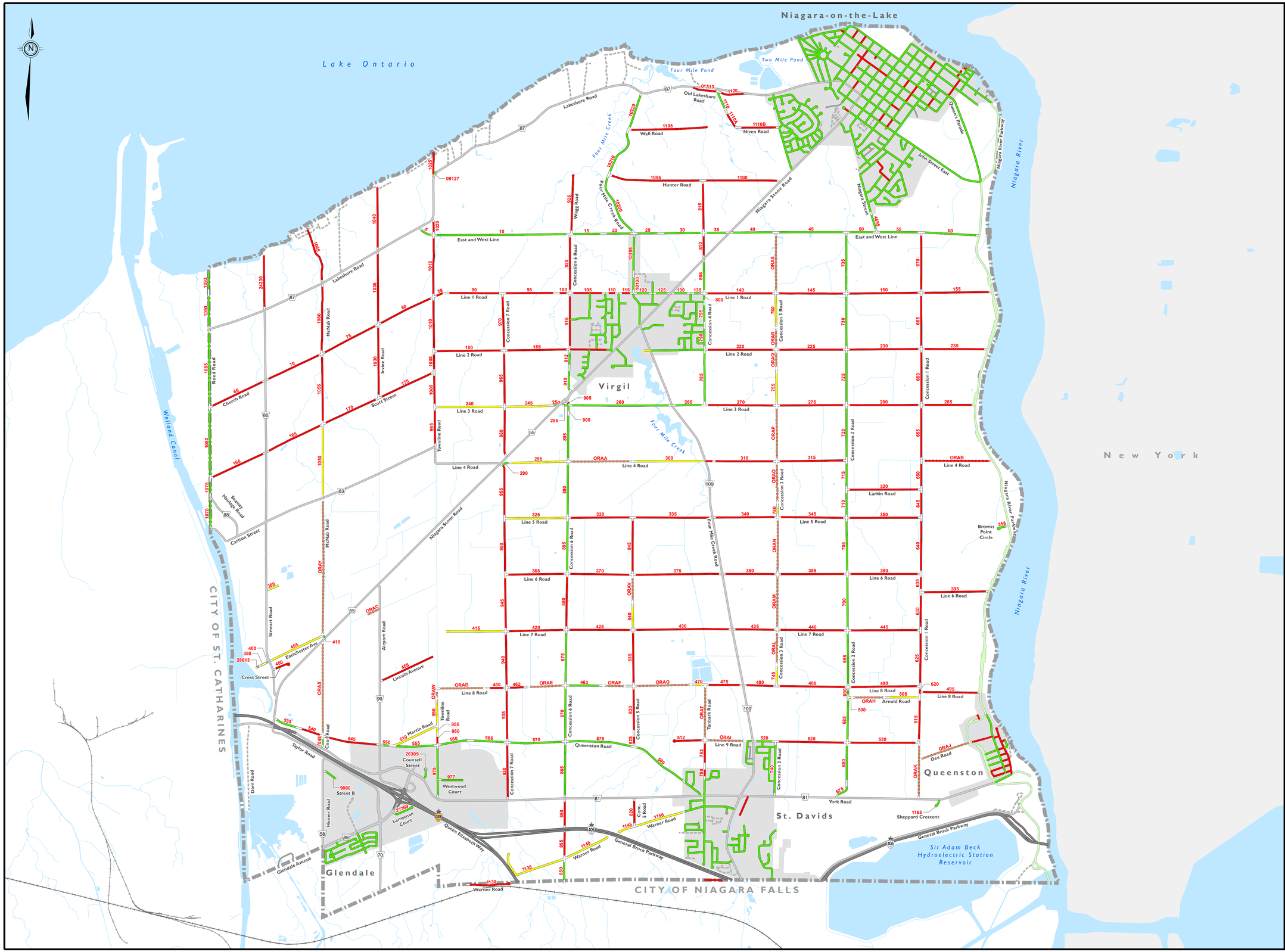
0 0.05 0.1 0.2 0.3 0.4 0.5

kilometers

1:7,500

UNLESS OTHERWISE NOTED

PROJECT No: C14-0608		CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No: 1B
APPROVER R. ALBRIGHT	APPROVER ---	
DATE: 2023-12-11		SHEET No: 2 of 8



LEGEND

SURFACE TYPE

- HIGH CLASS BITUMINOUS (ASPHALT)
- LOW CLASS BITUMINOUS (SURFACE TREATMENT)
- GRAVEL
- EARTH

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

- PROVINCIAL HIGHWAY
- REGIONAL ROAD
- MUNICIPAL ROAD NOT INVENTORIED
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- WATERBODY
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DATA SOURCES

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CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROAD SURFACE TYPE

SUB TITILE:

RURAL AREA

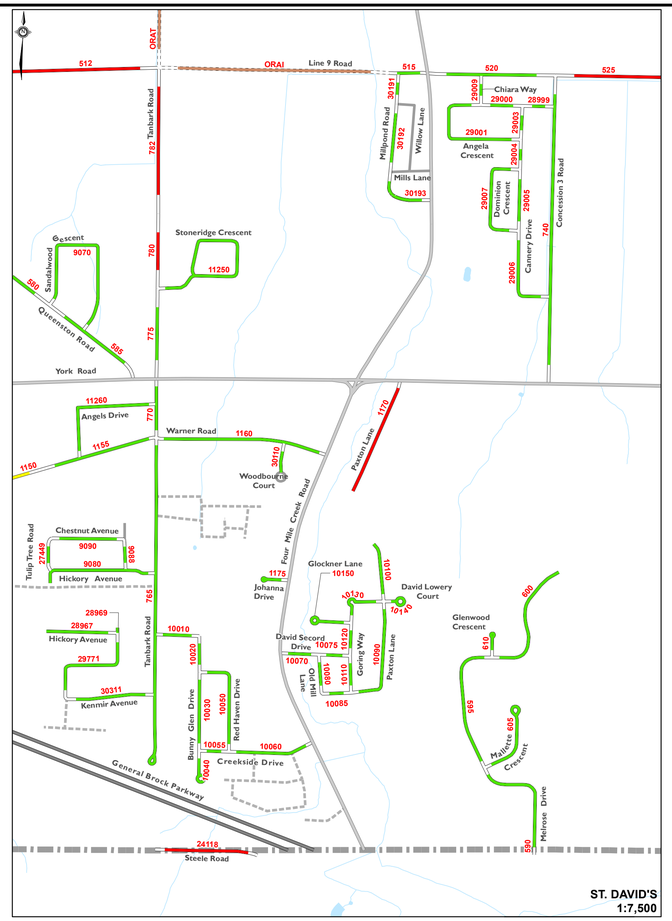
SCALE:

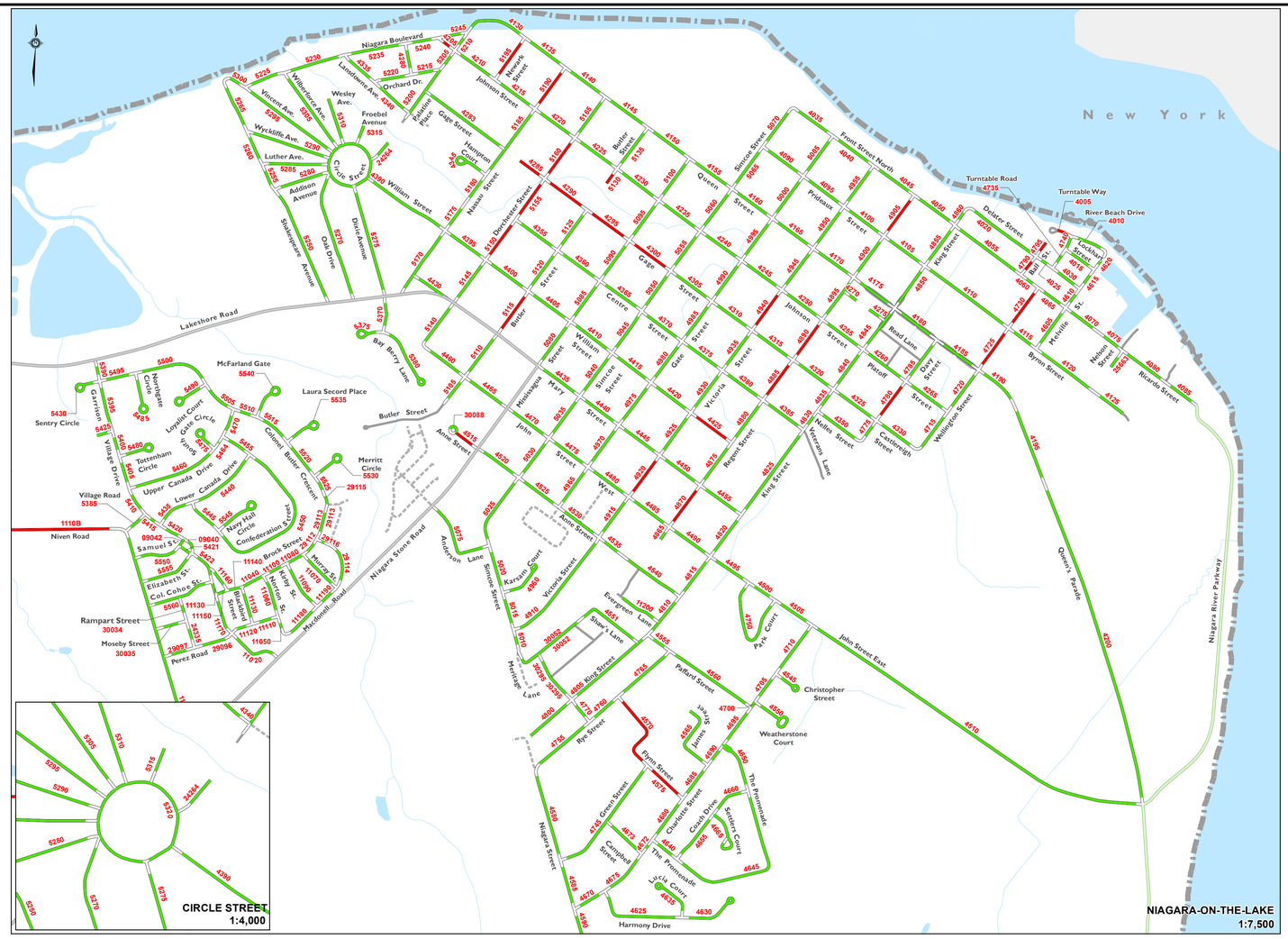
0 0.25 0.5 1 1.5 2

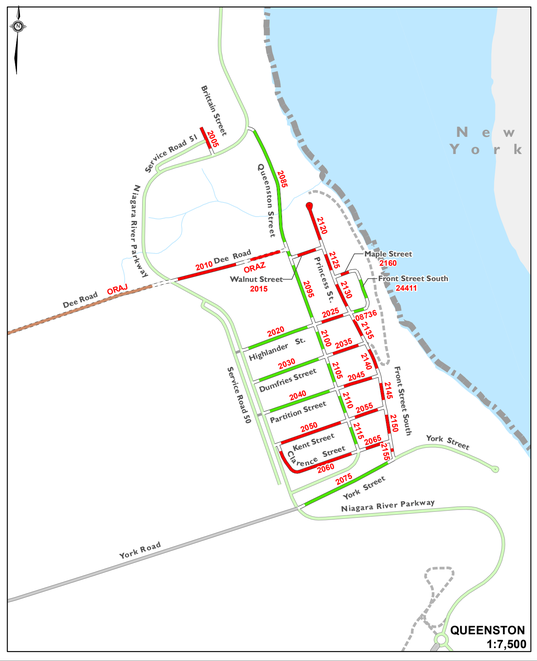
kilometers

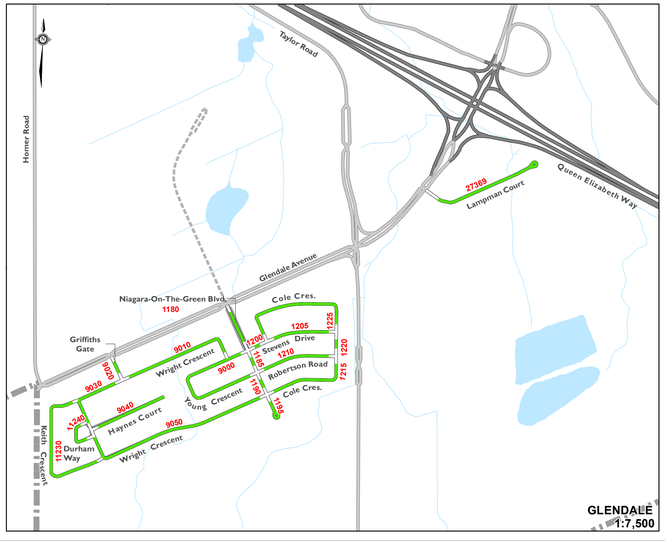
1:25,000

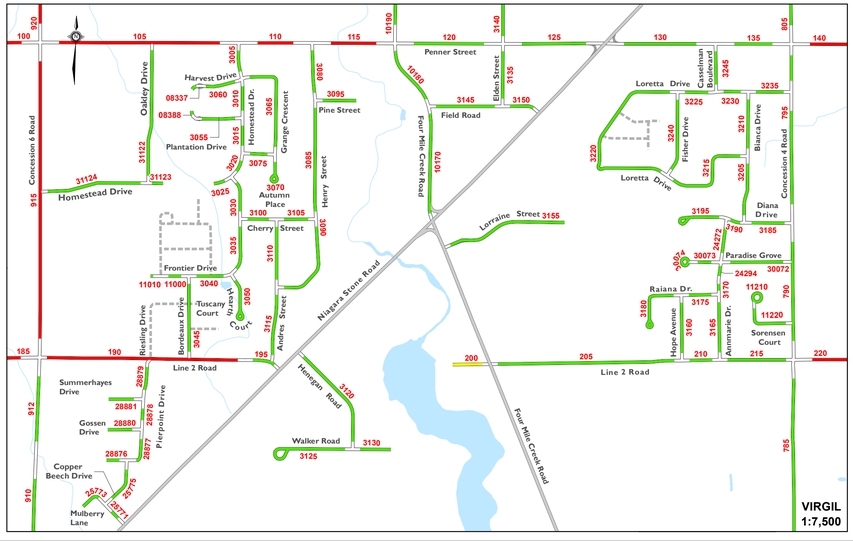
PROJECT No: C14-0608		CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No: 2A
APPROVER R. ALBRIGHT	APPROVER ---	
DATE: 2023-12-11		SHEET No: 3 of 8











LEGEND

SURFACE TYPE

- HIGH CLASS BITUMINOUS (ASPHALT)
- LOW CLASS BITUMINOUS (SURFACE TREATMENT)
- GRAVEL
- EARTH

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

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- PROVINCIAL HIGHWAY
- REGIONAL ROAD
- MUNICIPAL ROAD NOT INVENTORIED
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- PRIVATE ROAD

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- WATERBODY
- MUNICIPAL BOUNDARY

DATA SOURCES

RAILWAYS, WATERBODY & WATERCOURSE INFORMATION OBTAINED FROM LAND INFORMATION ONTARIO AND LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROAD SURFACE TYPE

SUB TITILE:

URBAN DETAILS

SCALE:

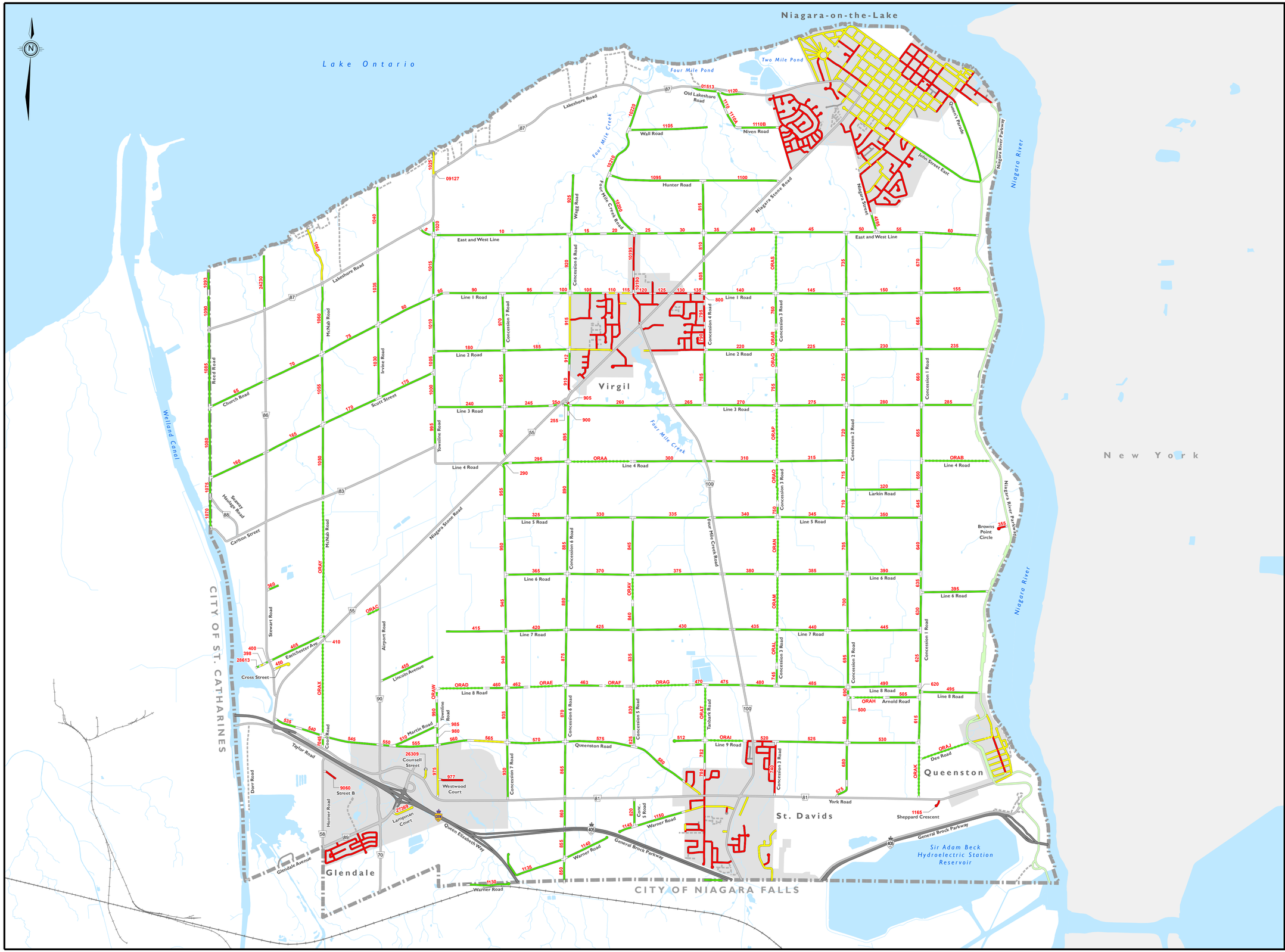
0 0.05 0.1 0.2 0.3 0.4 0.5

kilometers

1:7,500

UNLESS OTHERWISE NOTED

PROJECT No: C14-0608		CLIENT FILE No: ---	
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No:	2B
APPROVER R. ALBRIGHT	APPROVER ---		
DATE: 2023-12-11		SHEET No:	4 of 8



LEGEND

ROADSIDE ENVIRONMENT

- RURAL
- SEMI-URBAN
- URBAN

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

- PROVINCIAL HIGHWAY
- REGIONAL ROAD
- MUNICIPAL ROAD NOT INVENTORIED
- NIAGARA PARKS COMMISSION ROAD
- PRIVATE ROAD

OTHER FEATURES

- RAILWAY
- WATERCOURSE
- WATERBODY
- URBAN AREA
- MUNICIPAL BOUNDARY

DATA SOURCES

RAILWAY, WATERBODY & WATERCOURSE INFORMATION OBTAINED FROM LAND INFORMATION ONTARIO AND LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROADSIDE ENVIRONMENT

SUB TITILE:

RURAL AREA

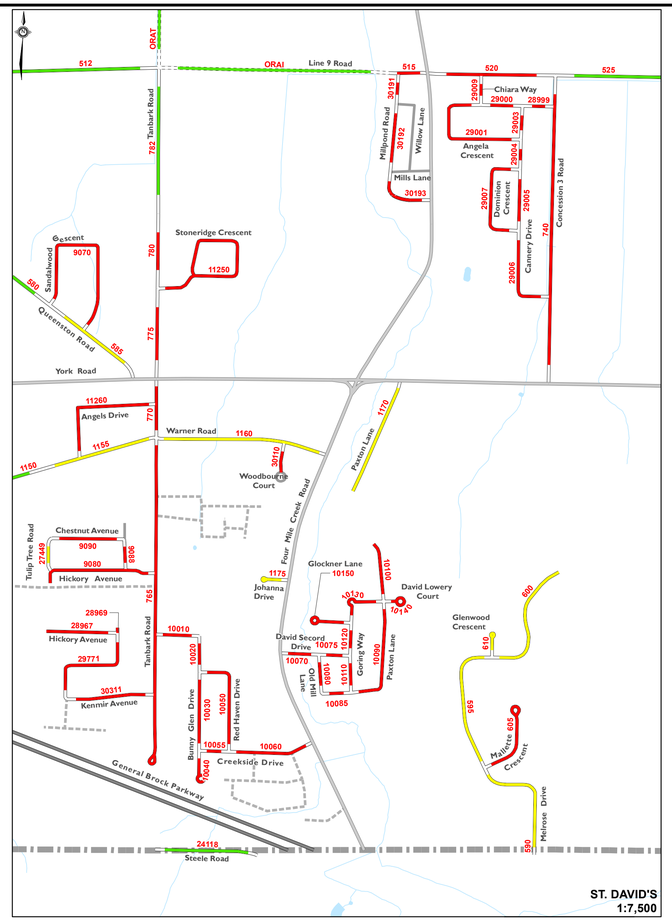
SCALE:

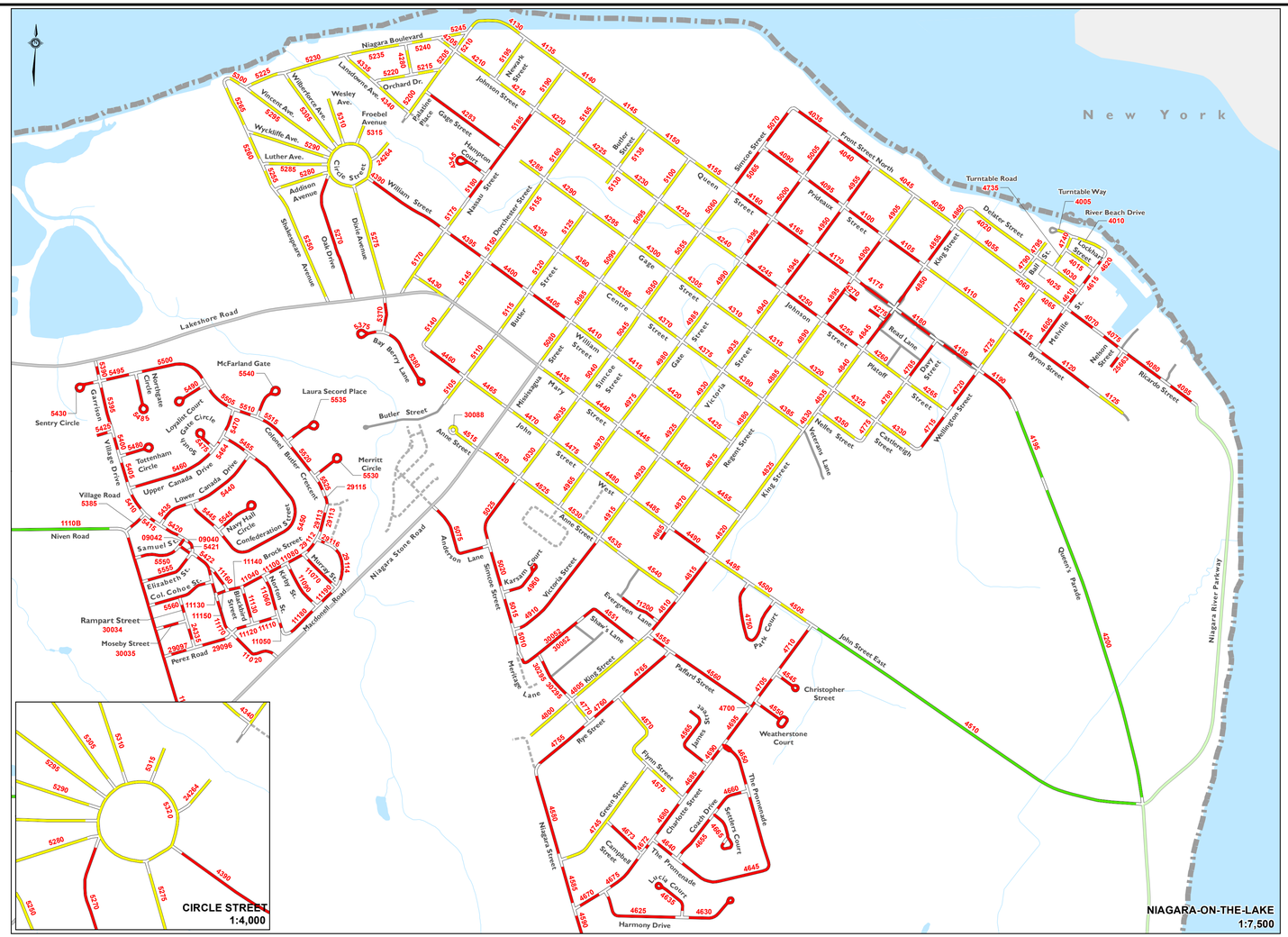
0 0.25 0.5 1 1.5 2

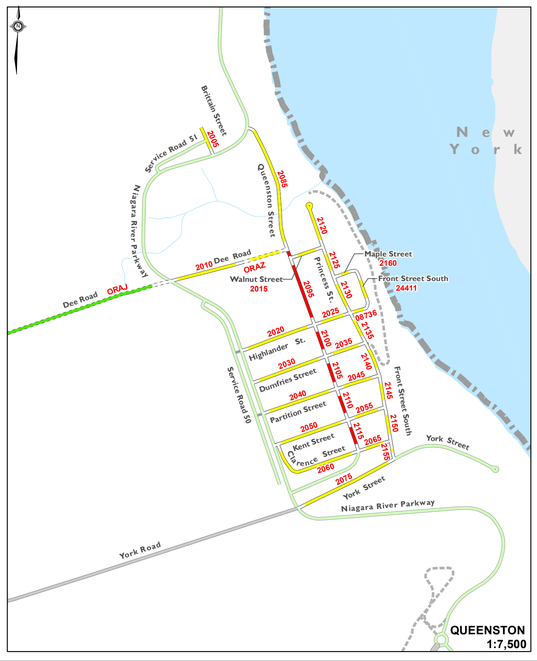
kilometers

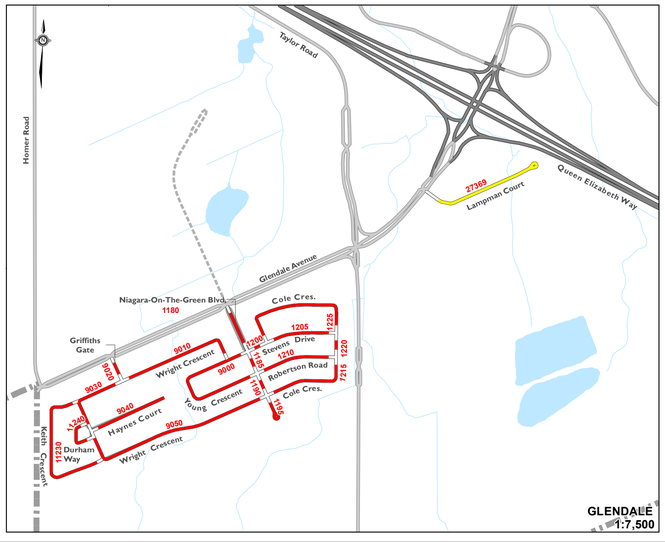
1:25,000

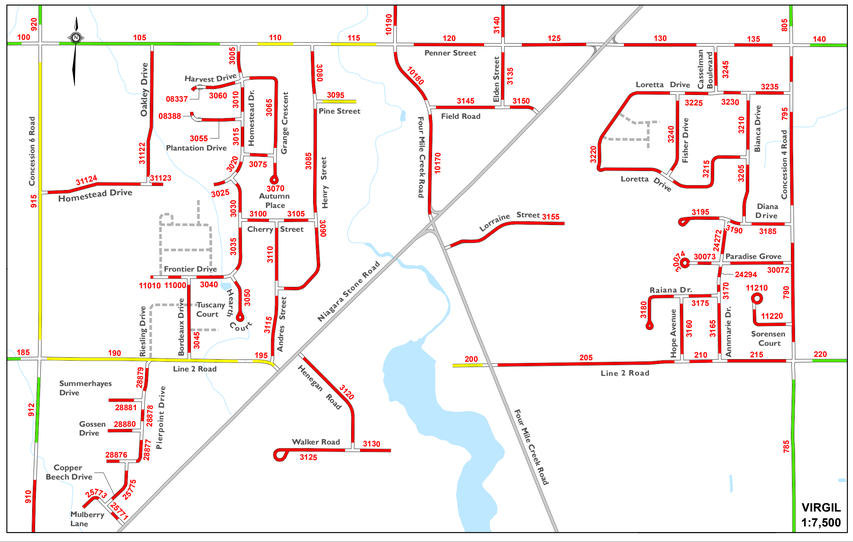
PROJECT No: C14-0608		CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No: 3A
APPROVER R. ALBRIGHT	APPROVER ---	
DATE: 2023-12-11		SHEET No: 5 of 8











LEGEND

ROADSIDE ENVIRONMENT

- RURAL
- SEMI-URBAN
- URBAN

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

- PROVINCIAL HIGHWAY
- REGIONAL ROAD
- MUNICIPAL ROAD NOT INVENTORIED
- NIAGARA PARKS COMMISSION ROAD
- PRIVATE ROAD

OTHER FEATURES

- RAILWAY
- WATERCOURSE
- WATERBODY
- MUNICIPAL BOUNDARY

DATA SOURCES

RAILWAYS, WATERBODY & WATERCOURSE INFORMATION OBTAINED FROM LAND INFORMATION ONTARIO AND LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

ROADSIDE ENVIRONMENT

SUB TITILE:

URBAN DETAILS

SCALE:

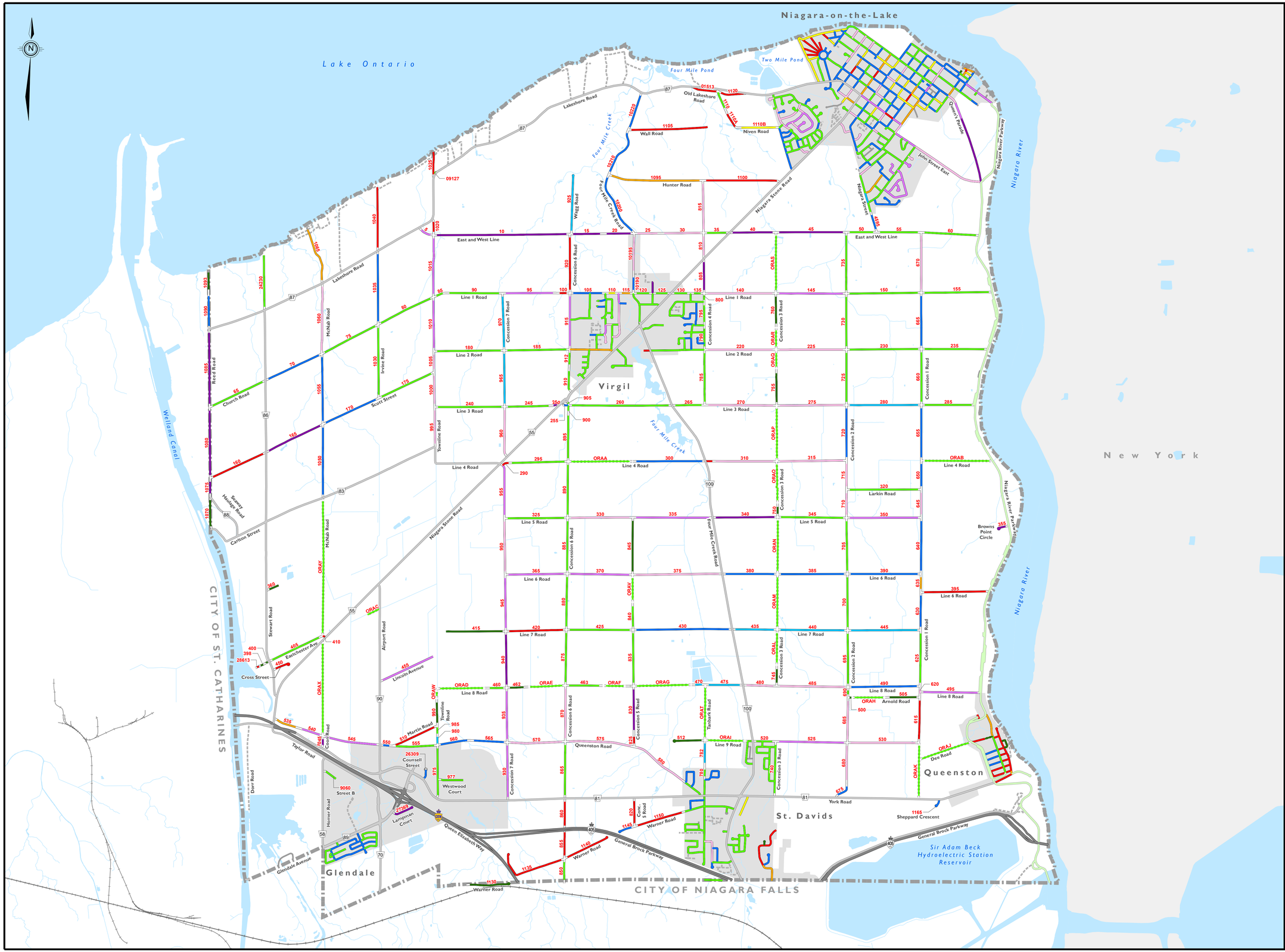
0 0.05 0.1 0.2 0.3 0.4 0.5

kilometers

1:7,500

UNLESS OTHERWISE NOTED

PROJECT No: C14-0608	CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER: ---
APPROVER: R. ALBRIGHT	APPROVER: ---
DRAWING No: 3B	
DATE: 2023-12-11	SHEET No: 6 of 8



LEGEND

ROAD IMPROVEMENT NEEDS

- ADEQUATE
- ADEQUATE (LOW TRAFFIC) WITH RECOMMENDED IMPROVEMENT
- ADEQUATE WITH RESURFACING NEED
- NOW CONSTRUCTION
- 1 TO 5 YEAR CONSTRUCTION
- 6 TO 10 YEAR CONSTRUCTION
- NOW RESURFACING
- 1 TO 5 YEAR RESURFACING
- 6 TO 10 YEAR RESURFACING
- MAINTENANCE

NOTE: DASHED LINE INDICATES AN UNOPENED ROAD

ROAD NETWORK

- PROVINCIAL HIGHWAY
- REGIONAL ROAD
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OTHER FEATURES

- RAILWAY
- WATERCOURSE
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DATA SOURCES

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CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

IMPROVEMENT NEEDS

SUB TITILE:

RURAL AREA

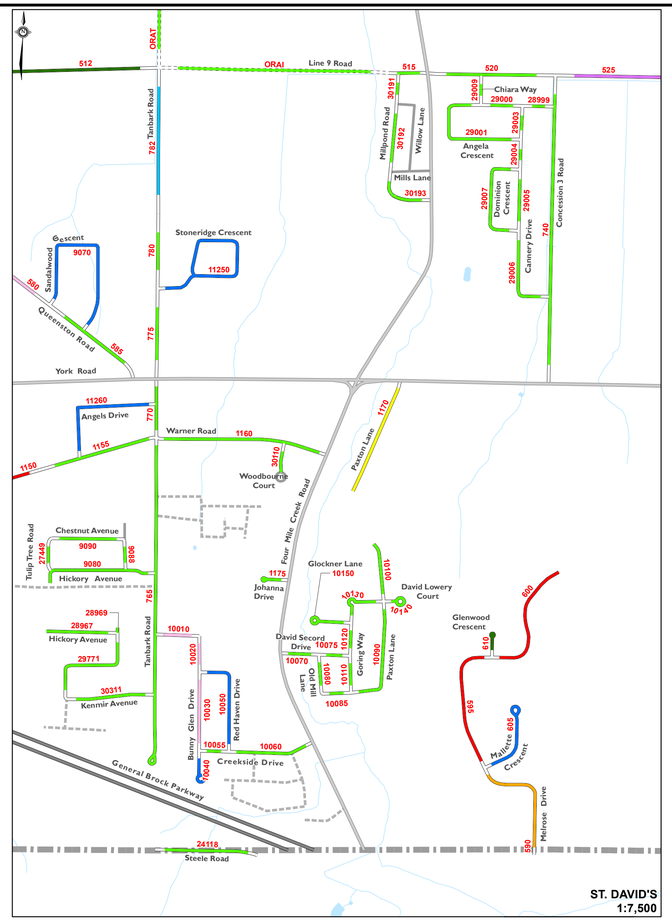
SCALE:

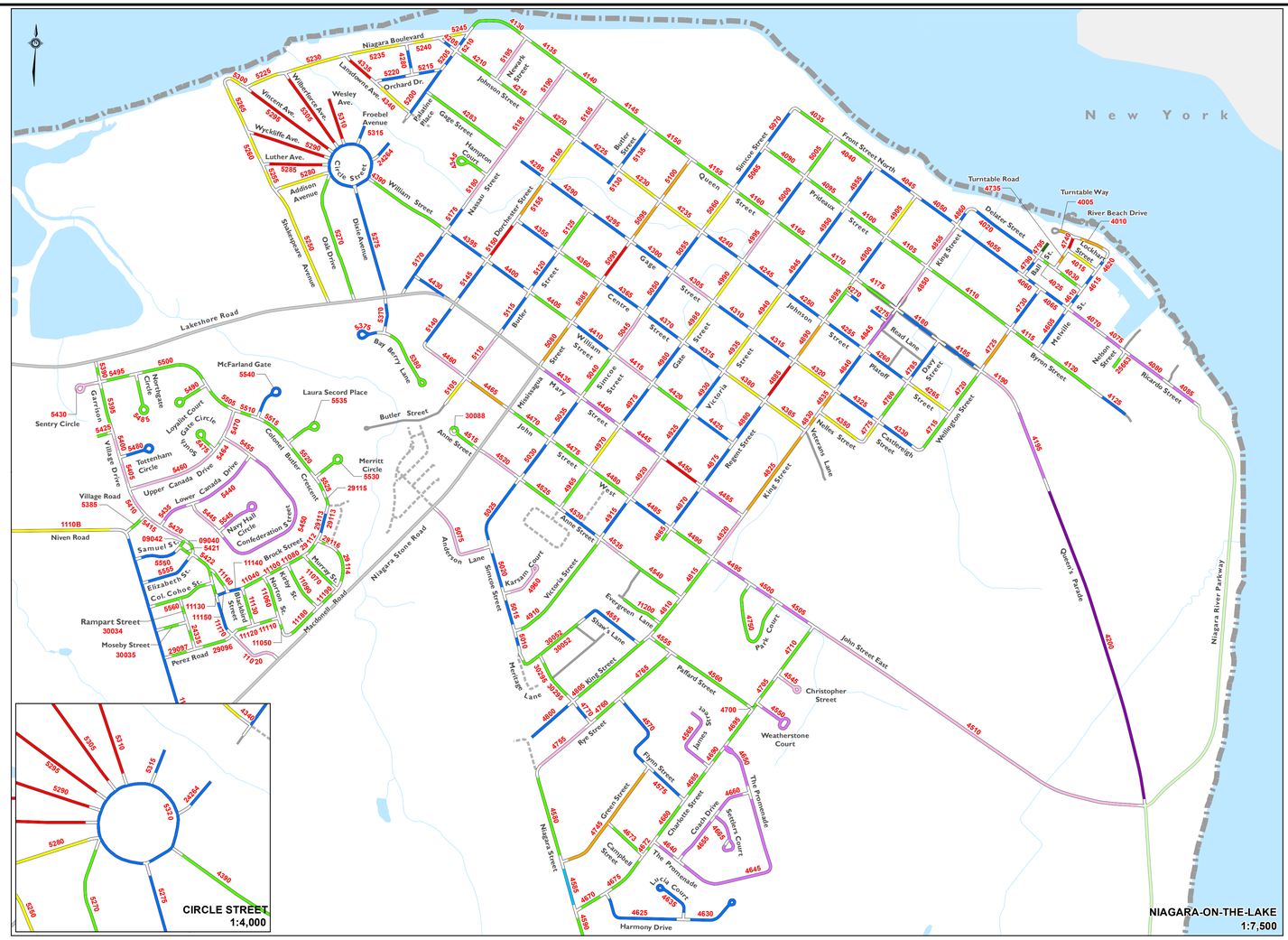
0 0.25 0.5 1 1.5 2

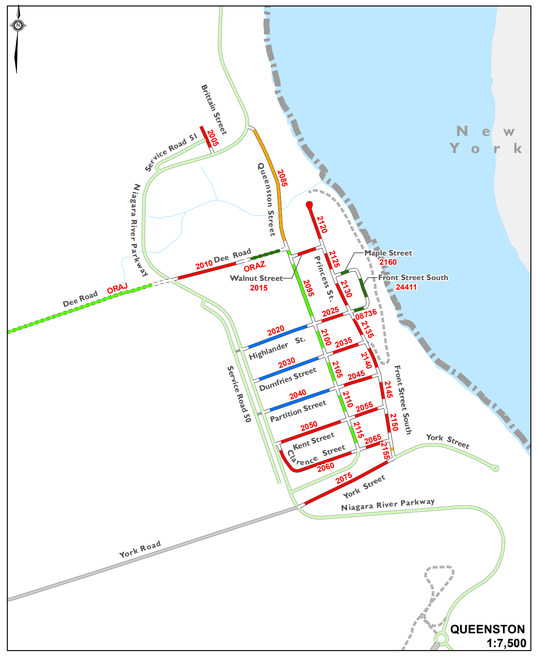
kilometers

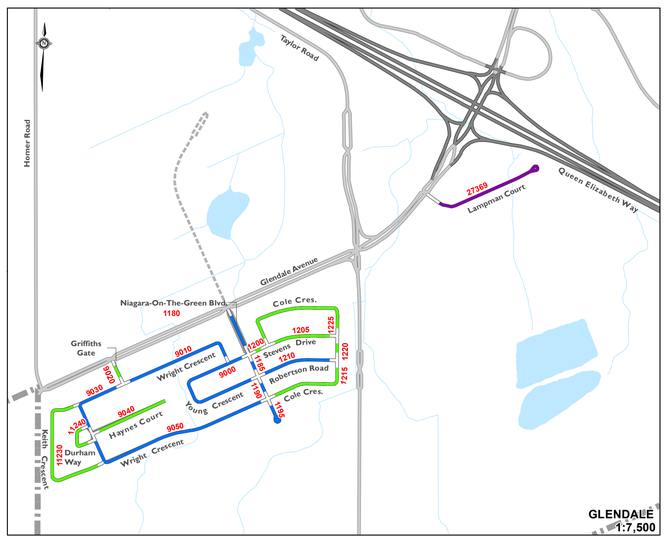
1:25,000

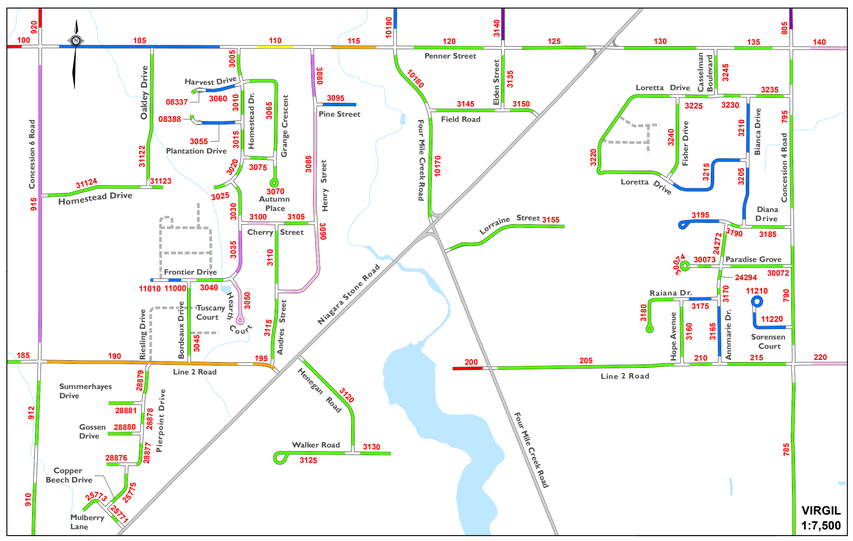
PROJECT No: C14-0608		CLIENT FILE No: ---
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No: 4A
APPROVER R. ALBRIGHT	APPROVER ---	
DATE: 2023-12-11		SHEET No: 7 of 8











LEGEND

ROAD IMPROVEMENT NEEDS

- ADEQUATE
- ADEQUATE (LOW TRAFFIC) WITH RECOMMENDED IMPROVEMENT
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- 1 TO 5 YEAR CONSTRUCTION
- 6 TO 10 YEAR CONSTRUCTION
- NOW RESURFACING
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CIMA+

4 ROADS MANAGEMENT SERVICES

CLIENT

Niagara-on-the-Lake EST.1781

PROJECT NAME:

2023 ROAD NEEDS STUDY UPDATE

SHEET TITLE:

IMPROVEMENT NEEDS

SUB TITILE:

URBAN DETAILS

SCALE:

0 0.05 0.1 0.2 0.3 0.4 0.5

Kilometers

1:7,500

UNLESS OTHERWISE NOTED

PROJECT No: C14-0608		CLIENT FILE No: ---	
DRAFTER: S. ELLIOTT	DESIGNER ---	DRAWING No:	4B
APPROVER R. ALBRIGHT	APPROVER ---		
DATE: 2023-12-11		SHEET No:	8 of 8