

REPORT

2021 Road Needs Study

The Corporation of the Town of Amherstburg

Submitted to:

The Corporation of the Town of Amherstburg

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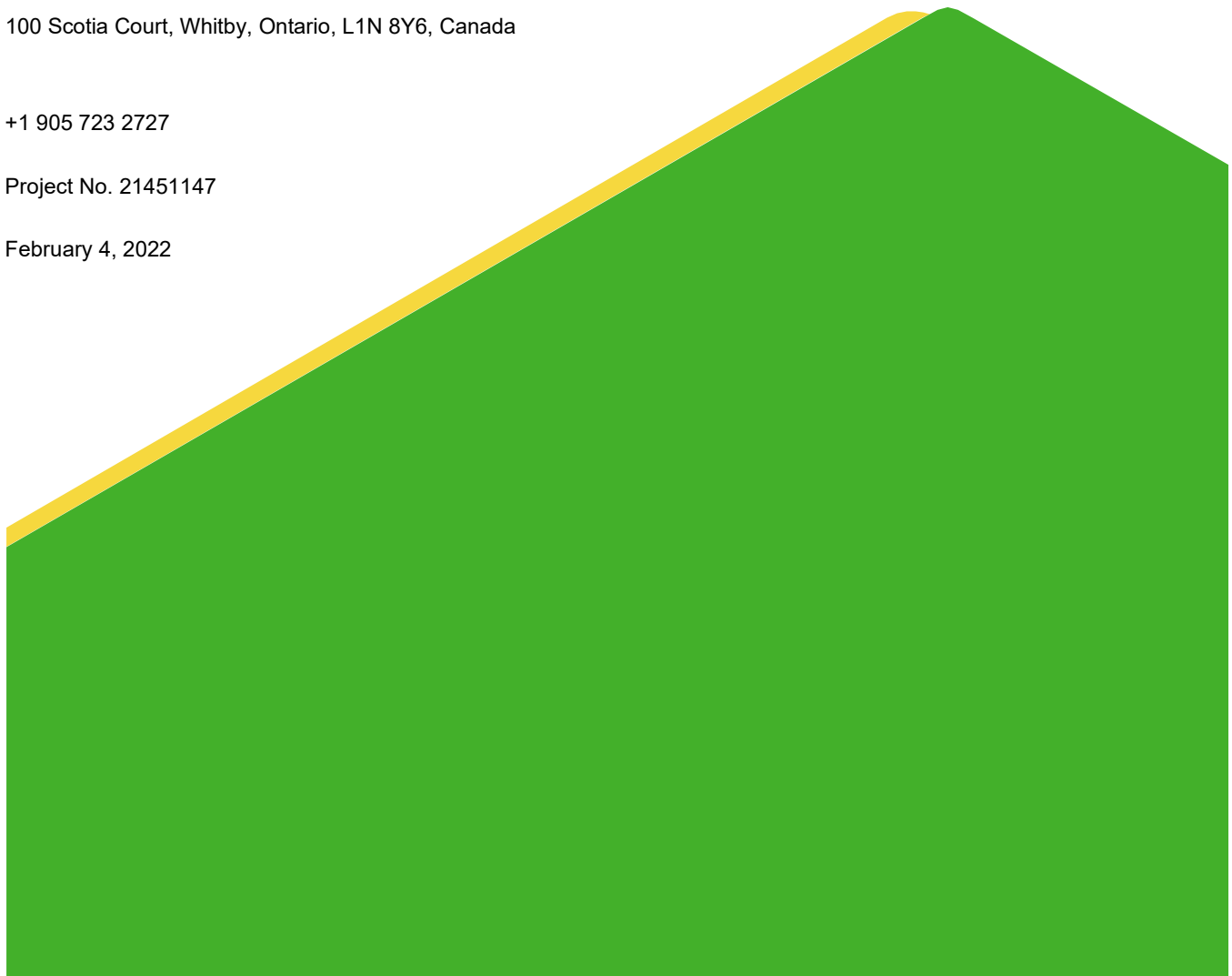
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Distribution List

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Executive Summary

This report presents the results of a Road Needs Engineering Study (Study) carried out for The Corporation of the Town of Amherstburg (Town), Ontario, in April 2021. The purpose of the Study was to update the Town's roads asset database to provide the basis for optimal management of its road network. Visual pavement condition surveys were carried out on all the Town's roadways in accordance with current Ministry of Transportation Ontario (MTO) practices. Pavement Condition Indices (PCIs) were assigned to each roadway evaluated, and two 10-year capital plans were developed (based on annual budget scenarios provided by the Town) using the DOT™ (Decision Optimization Technology) software. The resulting capital plans include forecasted timelines for preventative maintenance and rehabilitation treatments and provide the recommended preventative maintenance and rehabilitation strategies for each road section.

A total of 233 km of roads were assessed. The breakdown of road surface types is provided in Table 1. The 2021 average Pavement Condition Index (PCI) of the Town's Road network is estimated at 60 out of a possible 100, indicating a rating described as "Fair".

Table 1: Summary of Road Network by Surface Type

Surface Type	Length (km)	Percentage
Hot Mix Asphalt	163	70
Surface Treated	35.9	15.4
Gravel	32.8	14.1
Concrete	0.5	0.2
Paver Interlock	0.6	0.3

The two 10-year plan scenarios have different outcomes for the overall road network condition over the analysis period. The first scenario utilized an optimized approach with a fixed annual budget of \$4 Million, resulting in an improved overall road network condition PCI of 70 over the analysis period. The second scenario used a "Worst-First" approach resulting in a variable budget over the analysis period. The total budget required to address the "NOW" (PCI < 40) and the "1 to 5 years" needs are \$16.1M and \$4M, respectively.

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1.0 INTRODUCTION

The Corporation of the Town of Amherstburg (Town) retained Golder Associates Ltd. (Golder) to carry out Roads Needs Study (Study). The purpose of this Study report is to update the Town's roads asset database to provide the basis for optimal management of its road network. Visual pavement condition surveys were carried out on all the Town's roadways in accordance with current Ministry of Transportation Ontario (MTO) practices.

A pavement Condition Index (PCI) was assigned to each roadway segment based on an international roughness index (IRI) and type, severity and extent of distresses. The PCI's along with other road network information such as road type (i.e. asphalt, concrete, surface treated, gravel, etc.), road lengths and widths, classifications (i.e. urban, rural, semi-urban), MMS, user defined criticalities, etc. are entered into the Decision Optimization Technology (DOT) Roads software to develop optimized rehabilitation treatments. Two optimization scenarios with resulting 10-year capital plans were developed to include forecasted timelines for appropriate preventative maintenance and rehabilitation treatments.

This report should be read in conjunction with "Important Information and Limitations of This Report" included in Appendix A. The reader's attention is specifically drawn to this information, as it is essential for the proper use and interpretation of this report.

1.1 Background Review

The Town provided Golder with the following roads database to support the completion of 2021 Study:

- 2016 Road Needs Study Report and spreadsheet of the Road Inventory; and
- Shapefile (Amherstburg_RoadNeeds_Segments2021).

Golder communicated with the Town project manager upon reviewing the database to revise the attributes including new road segments, widths, shared roads, AADT (where applicable).

1.2 Condition Assessment Methodology

The pavement condition assessment, which identified the extent and severity of each specific distress type, was carried out based on Ministry of Transportation Ontario (MTO) methods for the appropriate surface type, as listed in the following references:

- Inventory Manual for Municipal Transportation Networks (Inventory Manual for Municipal Roads, 1991)
- For asphalt pavements – Lane, Becca, et al., 2016. *Manual for Condition Rating of Flexible Pavements: Distress Manifestations* SP-024, Downsview, Ontario: Provincial Highways Management Division, Highways Standard Branch, Materials and Engineering Office.
- For municipal asphalt pavements – Chong, G.J., Phang, W.A., and Wrong, G.A. 1989. *Flexible Pavement Condition Rating, Guidelines for Municipalities*, SP-022, Downsview, Ontario: Research and Development Branch, Ministry of Transportation of Ontario;
- For surface-treated pavements – Chong, G.J., Phang, W.A., and Wrong, G.A. 1989. *Manual for Condition Rating of Surface-Treated Pavements, Distress Manifestations*, SP-021, Downsview, Ontario: Research and Development Branch, Ministry of Transportation of Ontario;

- For gravel surface roads – Chong, G.J., Phang, W.A., and Wrong, G.A., 1989. Manual for Condition Rating of Gravel Surface Roads, SP-025, Downsview, Ontario: Research and Development Branch, Ministry of Transportation of Ontario.
- For concrete pavements – Chong, G.J., Phang, W.A., and Wrong, G.A., 1995. Manual for Condition Rating of Rigid Pavements, SP-026, Downsview, Ontario: Research and Development Branch, Ministry of Transportation of Ontario.

1.3 Electronic Ride Condition Assessment Program

Golder utilized technology from Rival Solutions and Total Pave to collect International Roughness Index (IRI), a measure of a road's roughness starting at 0 and increasing as surface roughness increases. The Town's roads attributes, including asset ID, GIS coordinates and surface type, were incorporated into automated mobile applications, which streamed raw smartphone sensor data to the cloud and then converted to IRI.

2.0 FIELD WORK

Pavement condition data was collected in April 2021 by Golder's staff. A total of 233 km (centerline) of roads were assessed. A summary of the surface types is provided in Figure 1.

■ Hot Mix Asphalt
 ■ Surface Treated
 ■ Concrete
 ■ Gravel
 ■ Paver Interlock

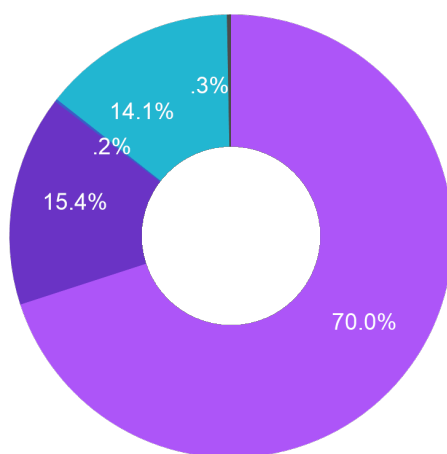


Figure 1: Breakdown of Roadway Surface Types

2.1 Visual Pavement Condition Assessment

The density and severity of the distresses were identified and recorded for each roadway segment. The types of typical surface distresses on asphalt/surface treated, concrete, gravel roadways are recorded as Distress Manifestation Index (DMI) in according to the MTO manuals listed in Section 1.2. DMI values are illustrated in Appendix C – 2021 Amherstburg Road Needs Study.

A Pavement Condition Index (PCI) was assigned to each roadway segment, based on the IRI and the Distress Manifestation Index (DMI) which is based on the types, severities and densities of the distresses observed. The PCI is rated on a scale from 0 to 100, 0 being very poor and 100 being excellent. Table 2 shows a breakdown of PCI values and associated typical pavement descriptions for an asphalt pavement.

Table 2: PCI Description of Asphalt Pavement

PCI*	Description of Pavement Section
80-100	Excellent
60-80	Good
40-60	Fair
20-40	Poor
0-20	Poor to Very Poor

Note: The PCIs assigned to Gravel and Paver-interlock Road sections were determined objectively based on Riding Condition Rating (RCR) and observed distresses.

2.2 Roughness Measurement (IRI)

The International Roughness Index (IRI) of each road segment of the following pavement surface; Concrete, High Class Bitumen (HCB) and Low-Class Bitumen (LCB) was collected using two electronic smartphone applications; Total Pave IRI and rRuf. The data was further calibrated to Golder's MTO calibrated Inertial Profiler to further refine the data. IRI results are included in Appendix C – 2021 Amherstburg Road Needs Study.

The limitation of using this technology is that IRI cannot be captured when driving at or near speeds of 30 km/h or less. As such, a Riding Condition Rating (RCR) was also assigned to some road segments and then converted to IRI (where possible).

2.3 Riding Condition Rating (RCR)

RCR data was mainly assigned for gravel and interlocked roads. The RCR is assigned based on the perceived comfort and safety of the ride, while driving at the posted speed. RCR is rated on a scale from 1 to 10, 1 being very poor and 10 being excellent; a breakdown is shown in Table 3, in accordance with MTO manuals listed in Section 1.2.

Table 3: Riding Condition Rating Scale

RCR	Description of Pavement Section
0-2	Very Poor – Uncomfortable ride with constant bumps and depressions. Cannot maintain posted speed and must steer clear constantly to avoid bumps and depressions
2-5	Poor – Uncomfortable ride with frequent bumps and depressions
5-7	Fair – Still comfortable ride with intermittent bumps and depressions
7-9	Good – Smooth ride with just a few bumps and depressions
9-10	Excellent – Very smooth ride

2.4 2021 Amherstburg Road Network Condition

The average condition of the Town's overall road network at the time of the survey in April 2021 was a PCI of 60 out of a possible 100, which is rated as "Fair". A complete list of the Town's Road sections and their 2021 PCI values are provided in Appendix C – 2021 Amherstburg Road Needs Study. Breakdown of the conditions and corresponding lengths and surface types are presented in Tables 4 and 5, and in Figure 2. Additional details on network overview are provided in Appendix D.

Table 4: Summary of Pavement Condition Based on Road Network Length

Condition	Length (km)	Percentage
Very Poor	21.5	9.2
Poor	38.2	16.4
Fair	64.8	27.8
Good	72.8	31.3
Excellent	35.5	15.3
Total	232.8	100

Table 5: Average PCI by Surface Type

Surface Type	Average PCI
Hot Mix Asphalt	55
Surface Treated	63
Gravel	63
Concrete	0
Paver Interlock	57

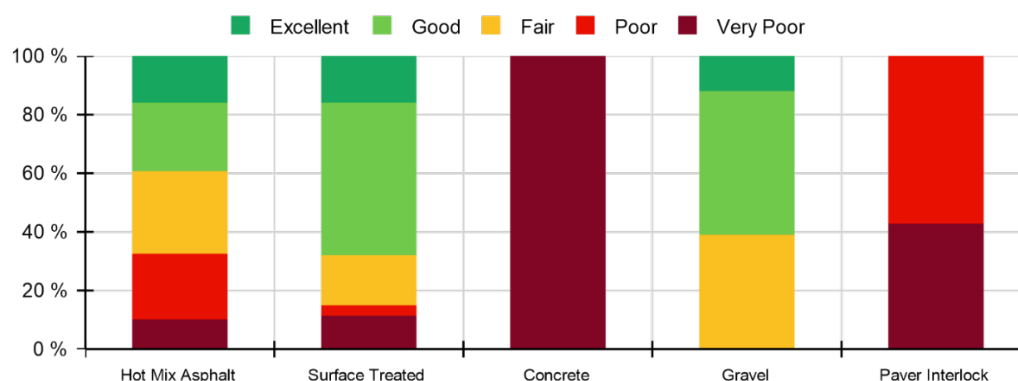


Figure 2: Surface Type Condition Status

A road network map of Amherstburg roads network including the condition of each road segment assessed in 2021 is shown in Appendix B.

The road sections listed in Table 6 were observed to be under construction or in a new subdivision development during the pavement condition evaluations. Some accessible roads were assigned a PCI; however, this may not describe the pavement condition as the surface layer was not installed. IRI was not collected in most of these sections due to speed limitation of software performance. Additionally, some notes were taken in critical road sections while assessment.

Table 6: Sections Under Construction or New Subdivision Development

Section ID	Section Name	PCI	Notes
1186	Alma Street	100	Under Construction or New Subdivision Development.
3006	Concession 2 North	79	Under Construction.
3125	Hilton Court	74	Under Construction.
3143	Whelan Drive	71	Under construction and surface layer has not been placed.
3144	Lambert Street	62	Under construction and surface layer has not been placed.
3145	Lambert Street	61	Under construction and surface layer has not been placed.
3146	Lundy Street	63	Under construction and surface layer has not been placed.
3147	Clarke Street	100	Under construction and surface layer has not been placed.
3149	McLellan Avenue	66	Under construction and surface layer has not been placed.
3150	Erie Isle Court	100	Under construction and surface layer has not been placed.
3151	Livingstone Crescent	66	Under construction and surface layer has not been placed.
3152	Westcott Road	59	Under construction and surface layer has not been placed.
3153	Kelly Road	100	Under construction and surface layer has not been placed.
3155	Meadowview Avenue	73	Under construction and surface layer has not been placed.
3156	Meadowview Avenue	64	Under construction and surface layer has not been placed.
3157	Pearson Street	71	Under construction and surface layer has not been placed.
3158	Ironside Street	79	Under construction and surface layer has not been placed.
3159	Caldwell Court	70	Under construction and surface layer has not been placed.
3162	Meadowview Avenue	100	Under construction and surface layer has not been placed.

3.0 DATA ANALYSIS

The Decision Optimization Technology (DOT) Roads software was used to facilitate preventative maintenance and rehabilitation budgeting by predicting the deterioration of pavement segments based on a wide range of pavement deterioration curves. Additionally, extensive decision trees, performance models, cost models, life cycle gain and condition improvement matrices covering a wide spectrum of road classifications were used. The modeling capability of the DOT program is based on traffic, surface type, subgrade type, environment, and maintenance history.

Utilizing a capital planning tool such as DOT with optimization capability can maximize the overall performance of a network in terms of physical condition (or any other criteria) over a multi-year analysis horizon. It can provide the Town with the best possible course of action in terms of timing and selection of different maintenance, rehabilitation, or reconstruction treatments considering all municipal goals and constraints.

It should be noted that the DOT software operates at the *network* level, rather than the *project* level. As such, the lists of projects programmed for each year in the capital plans are intended for budgeting purposes only and do not eliminate the need for further detailed project-level investigations and subsequent closer budgeting of the projects at the detailed design stage.

Two optimization scenarios were analysed based on project annual budgets specified by the Town, as follows:

1. Optimization with Fixed Annual Budget of \$4 Million.
2. Worst-First.

Unit costs for preventative maintenance and rehabilitation treatments were proposed by Golder and revised by the Town in 2021 (listed in Table 7) which were used in the DOT software for the optimization analysis. This typical cost includes labor, material and equipment for each treatment specified below.

Table 7: Assumed Unit Costs for Treatments

Treatment CODE	Description	
Surface Treated Roads		Cost/m² (\$)
ST-Slurry	Slurry Seal	3.15
ST-SST	Single Surface Treatment (Chip Seal)	5.00
ST-DST	Double Surface Treatment (Chip Seal)	10.00
ST-FDR & DST	Full Depth Reclamation + Double Surface Treatment	13.00
Hot Mix Asphalt Roads		Cost/m² (\$)
HMA-Crack Seal	Crack Sealing	0.25
HMA-Slurry	Slurry Seal	3.15
HMA-Ovly	One Lift Overlay / Mill and One Lift Overlay	20.00
HMA-2Ovly	Two Lift Overlay / Mill and Two Lift Overlay	40.00
HMA-FDARR & 2Ovly	Full depth asphalt removal and replacement (Two Lifts HMA)	45.00
HMA-FDARR & 3Ovly	Full depth asphalt removal and replacement (Three Lifts HMA)	65.00
HMA-Recon 90HMA Rural	Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA) – Rural Roads	99.00
HMA-Recon 90HMA	Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA) – Urban roads	170.00
HMA-Recon 140HMA	Full Depth Reconstruction (350 Gran B, 150 Gran A, 140 HMA)	190.0
Concrete and Paver-Interlock Roads		Cost/m² (\$)
PCC-Full Depth Repair	Full-Depth Slab Repair/Replacement	130.00

Treatment CODE	Description	
Paver Interlock-Restore	Paver Interlock Restauration 5% of Surface Area every 9 years	12.50
Paver Interlock-Recon	Full Paver Interlock Reconstruction	247.32
Gravel Roads		\$/Km
Re-Gravelling (50 mm or 2 in)	Re-Gravelling (50 mm or 2 in)	6,400.00
Re-Gravelling (100 mm or 4 in)	Re-Gravelling (100 mm or 4 in)	8,200.00
Rehabilitation	Rehabilitation	10,000.00
Grading	Grading	120.00
Drainage Maintenance	Drainage Maintenance	1,200.00
Dust Control	Dust Control	1,000.00
Upgrade to ST	Upgrade to ST	31,500.00
Re-Gravelling HT (100 mm or 4 in)	Re-Gravelling in High Traffic (100 mm or 4 in)	8,200.00
Rehabilitation HT	Rehabilitation in High Traffic	10,000.00
Grading-2Times	Grading-2Times	240.00
Grading-3Times	Grading-3Times	360.00
Grading-4Times	Grading-4Times	480.00

3.1 Results of analysis

The recommended treatment options to be carried out over the analysis period consist primarily of full depth reconstruction and routine maintenance.

The following sections present the predicted performance of the Town's Road network in terms of PCI, over the analysis period of 10 years. The first scenario with a fixed annual budget of \$4 Million shows an improvement in performance (PCI 70) at year 10 of the analysis, while the second scenario results in different outputs based on available budget to complete recommended treatment.

3.1.1 Scenario 1 – Optimization with Fixed Annual Budget of \$4 Million

The yearly predicted performance results for the budget of \$4 Million annual expenditure (\$3.85M major treatments and \$150K routine maintenance) are shown in Figure 3 and Table 8. A slight increase in network performance resulted from this scenario which maintains the state of performance in Fair over 10 years. Additional details regarding Scenario1, as well as the associated capital plans are given in Appendix E.

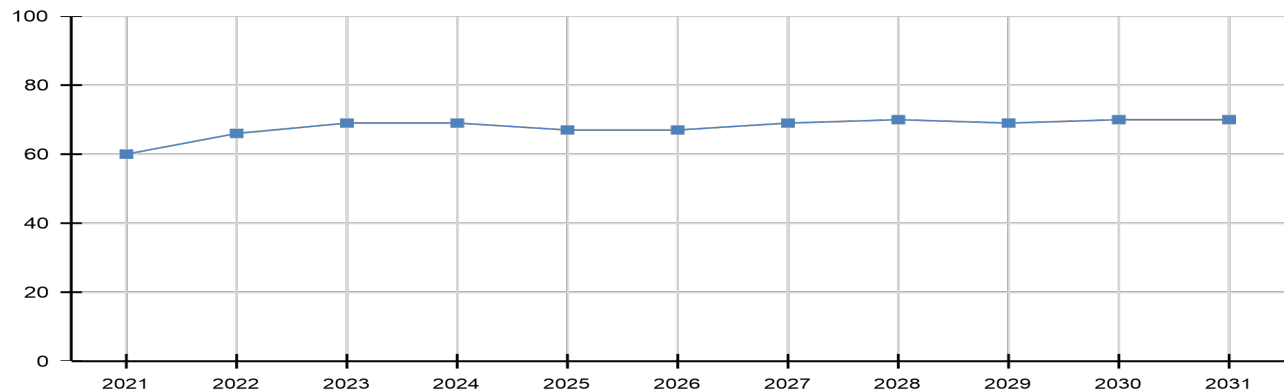


Figure 3: Scenario 1 - Network Performance (PCI) Over 10-Year Analysis Period

Table 8: Network Performance (PCI) – 4M Annual Expenditure

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Performance (PCI)	60	66	69	69	67	67	69	70	69	70	70

3.1.2 Scenario 2 – Worst First

Worst First scenario proposes treatment based on worst rated road segments in 2021, such that PCIs of 0-40 as NOW needs, PCIs of 41-60 in 1-5 YEAR, PCIs of 61-80 in 5-10 YEAR and above 80 is beyond 10 years. The recommended treatment options were revised in February 2022 to correspond to treatment options currently being used by the Town.

The budget required to address the NOW needs is \$16.1M, which is significantly higher than the \$4M annual budget used in Scenario 1, which is more representative of a typical annual budget used by the Town. As a result, it's not possible to predict the overall improvement in the network throughout the analysis period.

Additional details regarding Scenario 2 and the associated capital plans are given in Appendix F. Table 9 below shows a list of road segments that were rehabilitated after Golder's field work in April 2021 as per the Town's review in February 2022.

Table 9: List of Road Segments Completed in 2021

Asset ID	Name	Start Position	End Position	Treatment Year
3089	Wyandotte Street	Point West Drive	Culdasac	2021
3088	Point West Drive	Essex County Road 10 (west)	Angstrom Crescent	2021
3065	Lamp Road	Beneteau Drive	Culdasac	2021
1049	Fryer Street	Alma Street	Fort Street	2021
1056	Fryer Street	Fort Street	Military Street	2021

4.0 MAINTENANCE AND REHABILITATION TREATMENTS

The recommended road improvement strategies are included in the capital plans in Appendices E and F, for the two scenarios, each with an anticipated annual budget of \$4M. The treatment recommendations in the capital plans are listed by road section, with start and end location, length of section, suggested treatment (in short form) and budgeted cost. A brief description and the short forms and corresponding full names of the treatments are provided in Appendix G.

Typically, there are three categories of treatment types that are applied to roads at different PCI values, as summarized below.

Preventative Maintenance – Various maintenance treatments (such as crack sealing, slurry seal, enhanced thin surfacings, etc.) are applied to the pavement surface typically when the pavements are in fairly good to excellent condition (for example, PCI values between 65 and 85), to extend the serviceable life and delay the need for more costly rehabilitation or reconstruction.

Minor and Major Rehabilitation – More extensive reactive maintenance or rehabilitation is applied to pavements that have deteriorated to a point where overlays or localized full depth repairs are required (for example, PCI values between 40 and 65), to delay the need for more extensive and costly reconstruction.

Reconstruction – Once the PCI reaches a threshold value (for example, PCI of 40), the pavement structure may require full reconstruction to support traffic over the next 15 or 20 years. Once the pavement is in poor condition, rehabilitation strategies such as resurfacing are no longer cost effective or appropriate.

5.0 KEY CONSIDERATIONS FOR GRAVEL ROAD MAINTENANCE

This section discusses some general guidelines and recommendations on utilizing best maintenance practices and management concepts for gravel roads.

5.1 Building a Proper Cross Section

Building a proper cross section is the primary objective of gravel road maintenance operations. A properly shaped cross section with adequate crown and shoulder cross slope (crossfalls) drain water away from the pavement structure and extends its service life. A typical crossfall for the traveled lanes is between 4% and 5%. The crossfall deteriorates over time and reaches a point at which it no longer sheds water and deteriorates more quickly. Without adequate crossfall, water accumulates on the road surface and softens the crust and penetrates into the subgrade. A typical gravel road cross fall is shown on Figure 4.

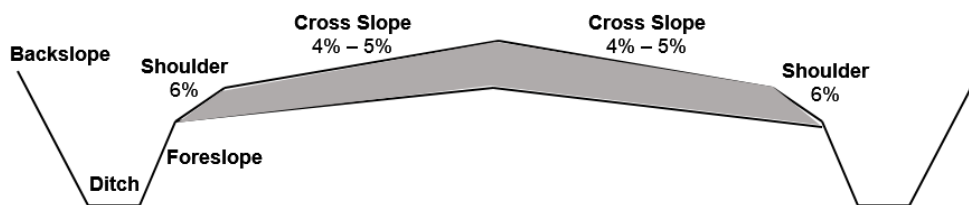


Figure 4: A typical gravel road cross section

Inadequate crowns can quickly result in surface distresses such as potholes, rutting, or deformation, especially under heavy traffic loading. Many studies show that poor performance of gravel roads can be attributed mostly to lack of crossfall and inadequate surface drainage, even in semi-arid regions. Excessive crowns (i.e., crossfalls more than 6%) are not recommended either due to safety issues. Excessive crowns can cause loss of control while driving and encourage road users to drive in the middle of the road regardless of the surface width.

A gravel road cross section should also be adjusted at curves to provide adequate superelevation. By raising the outer edge of a curve on a road above the inner edge, a superelevation reduces the effect of centrifugal force on vehicles and provides better control while turning. Lack of superelevation or improper transition from a crown to a superelevation can become a safety hazard and increases the risk of accident. During maintenance operations, the grader operator should build a gradual transition from a crowned surface to a straight superelevated surface.

Typical lane widths for a gravel road are 3.5 m but can vary from 3.0 m to 3.7 m. Shoulders are graded at around 6% to provide adequate drainage by directing water further from the road surface down the foreslope and into the ditch. Frequently, gravel roads might not have defined shoulders. Road shoulders should be kept at the same level as the edge of the road surface. Sudden drop-offs can lead to safety hazards while high shoulders prevent water from draining off the road surface into the ditch. High shoulders can result in a secondary ditch along the side of the road that erodes gravel material and subgrade soil resulting in various defects. High shoulders are usually the result of poor maintenance practices.

Ditches are also important to drain water away from the roadway subgrade. Ditches need to extend to below top of subgrade and require periodic cleaning to ensure debris, vegetation, or excess gravel material migrating from the road surface are removed. Similar to ditches, culverts should be maintained periodically to ensure there is no obstruction to prevent the natural flow of water under the road and to ensure that the culverts are not perforated, crushed or distorted. Care should be taken during maintenance and installation of culverts to ensure proper inlet/outlet elevations, and alignment with the flow line of the ditch is achieved to avoid any washout or erosion around the outlets.

5.2 Materials for Use

While many agencies use granular road base materials for surfacing on gravel roads, it is not necessarily the ideal material for use in terms of serviceability and maintenance. Road base granular materials are designed to have high structural capacity as well as good drainage characteristics. While structural capacity is also good for a gravel road, the free draining nature of the surfacing is not necessarily an advantage.

Construction granulars can be pit run, produced from a quarry source (in which case they will be 100 per cent crushed) or a partially crushed pit source material (partly crushed). The crushed content of an aggregate improves its structural capacity since the rough crushed faces provide better granular interlock compared to rounded particles. Crushed products are preferred for gravel roads. Irrespective of the percent of crushed particles, the particles themselves must be hard and durable. A good test for this is the MicroDeval test. Road surfacing gravels should have maximum MicroDeval losses on the coarse fraction of less than 25%.

Most granular road base materials allow 15 to 20% of coarse material larger than 19 mm. In general, gravel road surfacing should be 100% finer than 19 mm since it provides a smoother ride quality and is less prone to segregation. It also needs an adequate percentage of sand sizes to fill the voids. Typical granular bases will have 45 to 70% passing the 4.75 mm sieve. For gravel road surfacing, the sand sizes should be at the higher end of this range.

There is a lot of practical experience that indicates that surfacing gravels with a higher percentage of fines (material finer than 0.075 mm) perform better. For road base granular materials, the fines are usually restricted to 8 to 10% maximum, so as to not impede drainage. However, many agencies prefer fines content up to 15% for surfacing gravels. They will also allow the materials to have Plasticity Indices of 4 to 12%, while for most road base granular materials the fines are required to be non-plastic. In a road surfacing application, the higher fines content bind the material and allow a crust to form on the surface which can reduce material loss.

Some agencies also allow the addition of Recycled Asphalt Product (RAP) in road surfacing granulars. With increasing use of cold milling for road maintenance, large volumes of RAP are readily available. In general, the addition of RAP should not be greater than 30% as above that, the material may no longer be “unbound” and so maintenance regrading activities become more problematic.

5.3 Proper Grading Operation

Several studies have been published on proper grading techniques. This section does not provide a detailed review of proper grading techniques; however, some of the main issues and considerations are discussed. Operating speed should be slow enough to avoid bouncing and creation of cut depressions on the road surface. A speed range of 5 to 10 km per hour is typically recommended; however, factors such as the quality of material, moisture, or subgrade strength can affect the proper operating speed. Operators should maintain a proper blade angle, typically between 35 to 45 degrees, during the grading maintenance to recover material and avoid spilling from the toes of the blade. To achieve proper mix and to avoid material loss, it is also important to use a proper blade pitch. Excessive backward pitch can result in poor mixing action and also high shoulders. Excessive forward pitch, on the other hand, may result in poor mix and lack of enough penetration to remove surface defects and may not create a smooth ride quality. A proper blade pitch and angle result in a good mixing action with enough penetration to fix surface defects with minimum material loss during the grading operation.

5.4 Dust Control

Gravel roads give off dust under traffic action. The amount of dust generation can be affected by factors such as gravel material properties, the percentage of fines, annual precipitation, and the level of daily traffic. Excessive dust from gravel roads can cause health issues, poor air quality to nearby residents, environmental damage, and also increase the risk of accidents. The most common dust suppressants are calcium chloride and magnesium chloride. These are typically applied in liquid form from a tanker with spray bar. Calcium chloride draws moisture from the air resulting in a damped road surface that reduces the amount of dust generation. Proper dust control can also reduce gravel loss and required grading maintenance cycles. For effective dust control operations, gravel roads should have optimum moisture to allow for complete absorption of the dust suppressant.

5.5 Gravel Road Treatments

A practical condition rating scheme for gravel roads was developed by MTO based on evaluating condition under a set of distress modes in conjunction with an evaluation of the ride quality. This produces an estimate of PCI. A distress manifestation index is calculated from the evaluation of the road condition under eight distress modes as listed in Table 10. A range of maintenance treatments can then be assigned based on the PCI and major distress types as shown in Table 11.

Such systematic approach for condition assessment of gravel roads provides consistent and representative condition ratings and identifies the predominant surface defects while performing a network-level analysis. It also allows the identification of any underlying conditions that decrease the effectiveness of routine maintenance.

Table 10: Gravel Roads Distress Manifestation (MTO 1989)

Distress Mode	Distress Type
Surface Defects	Loose Gravel
	Dust
	Potholes
	Break-up
Surface Deformation	Washboarding
	Rutting
	Flat / Reverse Crown
	Distortion

Table 11: Example of Using PCI data to determine proper maintenance treatment actions

PCI Range	Treatment
80-100	Routine maintenance
60-79	Routine maintenance. Dust control may be necessary for residential areas.
40-59	Increased routine maintenance necessary. Addition of gravel and dust control additives become necessary.
20-39	Maintenance with addition of gravel necessary. Dust control a must for residential areas. Some portions may need rehabilitation.
0-19	Rehabilitation necessary.

6.0 DOT SOFTWARE

The optimization analysis utilizing the DOT software was provided as part of this Road Needs Study. Ongoing use of the DOT software is available to the Town at additional cost and can be facilitated through Infrastructure Solutions Inc. (ISI) directly. It is recommended that the pavement condition surveys be updated every three years.

7.0 TRAFFIC COUNTS

Golder retained Ontario Traffic Inc. (OTI) to estimate daily traffic counts for 29 intersection locations and 70 road sections within the boundaries of the Town of Amherstburg. OTI collected data between June 15, 16 and 17, 2021. It should be noted that the traffic counts were conducted during Step 1 of the Province of Ontario's reopening plan (from the COVID-19 Pandemic) which began on June 11, 2021. Data may not accurately represent the current traffic volumes due to provincial restrictions.

Automated Traffic Recorders (ATR) were used to collect 24 hours traffic volume in 70 two-way road sections. Turning Movement Counts (TM) were used to collect traffic volumes in 29 intersections for a duration of 8 peak hours. Table 12 illustrates details of each traffic count device. The coordinates of ATR and traffic volume of 70

road sections are included in Appendix H – Traffic Volumes. All OTI collected data, including traffic classification and directions, will also be provided in soft copies via email.

Table 12: Traffic Volumes

Traffic Counts Device	Hours	Number of locations
ATR	00:00 – 24:00	70
TM	07:00 – 09:00 11:00 – 14:00 15:00 – 18:00	29

It should be noted that to establish Average Daily Traffic (ADT), 7-day traffic volume counts are required. As well, to estimate Annual Average Daily Traffic (AADT), a seasonal factor should be considered. The best practise is to collect ADT in three different seasons (Winter, Summer and Fall).

8.0 PROJECT LEVEL INVESTIGATION

As discussed, in Section 3.0, this network level survey, is sufficient for capital planning purposes, but does not absolve the municipality from carrying out project level analysis to refine the rehabilitation recommendations produced herein. Upon approval of the 10-year capital plan, Golder is also available to provide project level support for annual rehabilitation and capital road works programs. Our experienced pavement and geotechnical engineers have provided rehabilitation recommendations to all tiers of government across Canada, with the intention of providing an improved level of service, while meeting the needs of the capital plan and annual budget. Further, at the detailed project level, new pavement materials and construction technologies or technologies not considered during the capital planning analysis can be considered to further optimize the rehabilitation strategy.

9.0 CLOSING

We trust the information provided in this report satisfies your needs. We will be pleased to assist further with respect to developing specific annual maintenance plans based on the results of this study, if required. Please do not hesitate to contact the undersigned if you have further questions.

Signature Page

Golder Associates Ltd.



Mohamed Maslati, B.Eng., EIT
Materials and Pavement Engineer-In-Training



Michael P. Navarra, M.A.Sc., P.Eng., PMP
Associate, Materials and Pavement Engineer

MSM/MPN/msm;ljb;mes

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[https://golderassociates.sharepoint.com/sites/140136/project files/6 deliverables/final/21451147 rep rev0 2022'02'04 amherstburg 2021 ms final.docx](https://golderassociates.sharepoint.com/sites/140136/project%20files/6%20deliverables/final/21451147%20rep%20rev0%202022%02%04%20amherstburg%202021%20ms%20final.docx)

APPENDIX A

Important Information and Limitations of This Report

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report: This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder cannot be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client can not rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder can not be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Ground Water Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

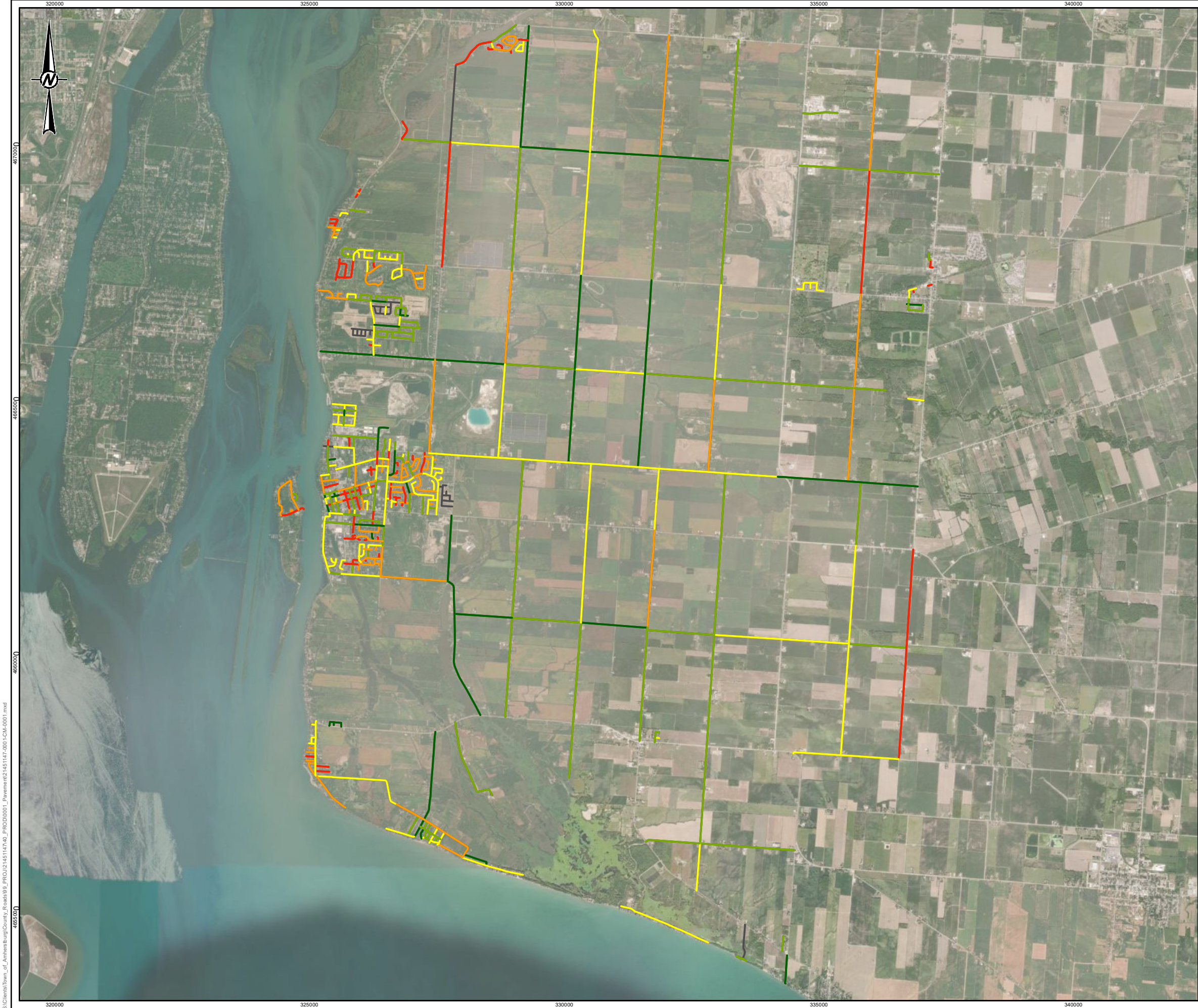
During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

2021 Road Network Maps



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 2 4

1:75,000 KILOMETRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	
	APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B1



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500
1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

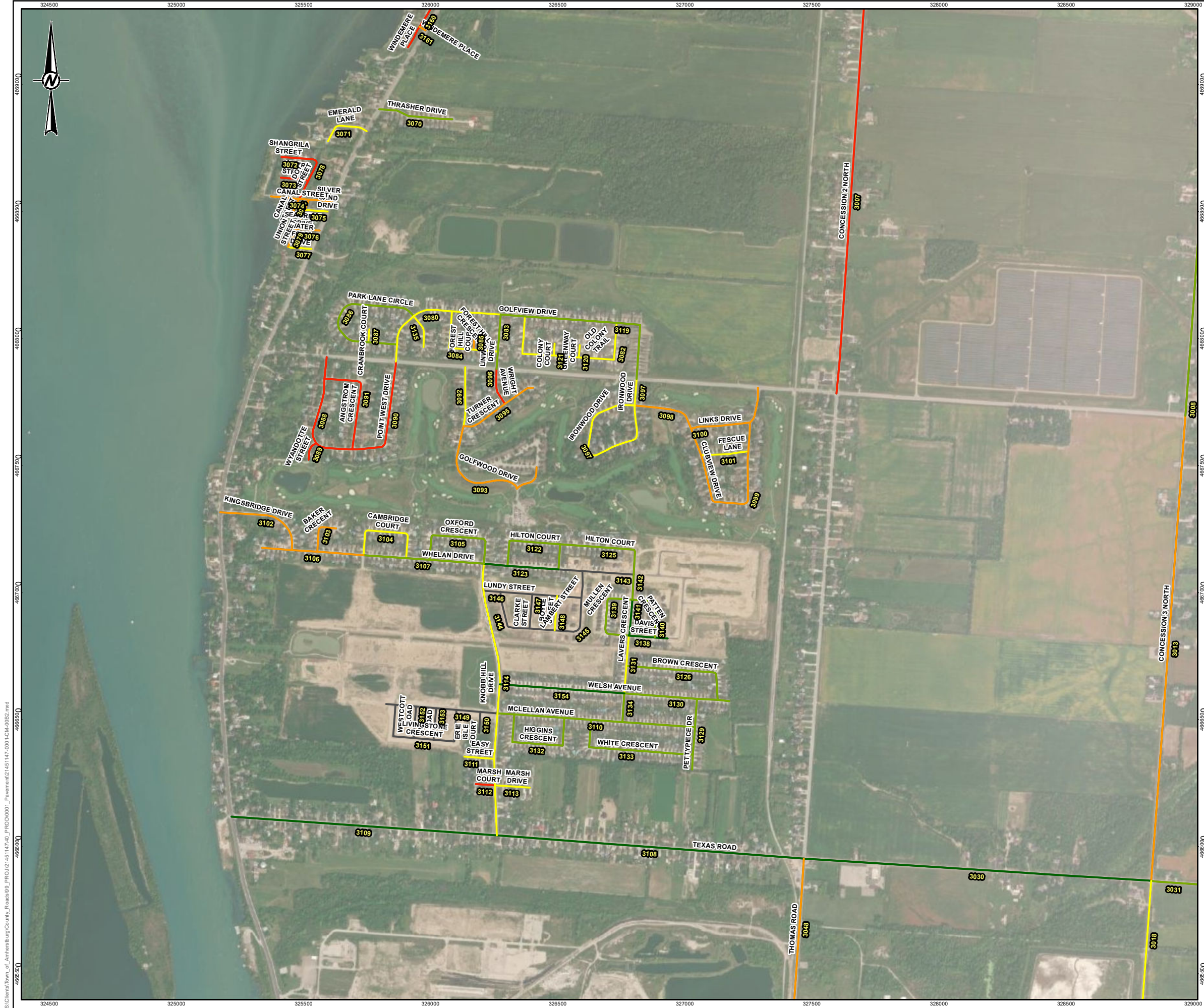
2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-2



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-4



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-5



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500
1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

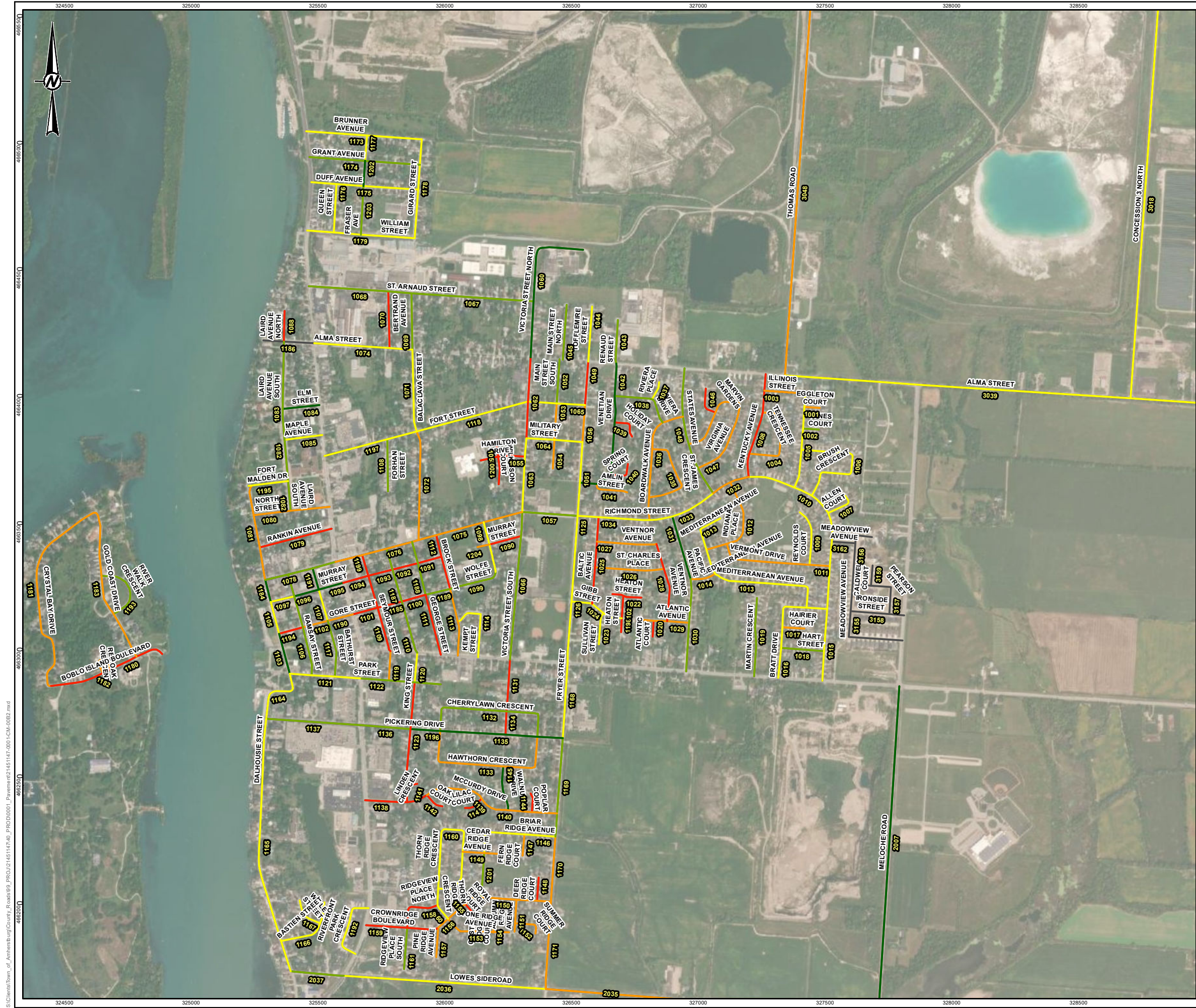
2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO. 21451147	CONTROL 0001	REV. A	FIGURE B2-6
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LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500
1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-7



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-8



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

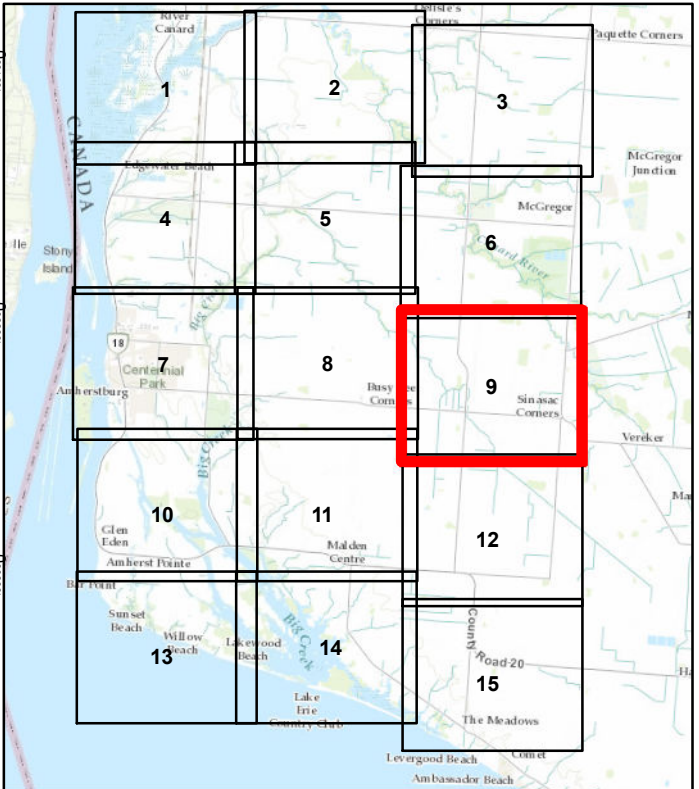
EXCELLENT

GOOD

FAIR

POOR

VERY POOR



REFERENCE(S)
1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT
2021 ROADS NEEDS STUDY

TITLE
2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN



PROJECT NO. 21451147	CONTROL 0001	REV. A	FIGURE B2-9
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LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-10



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

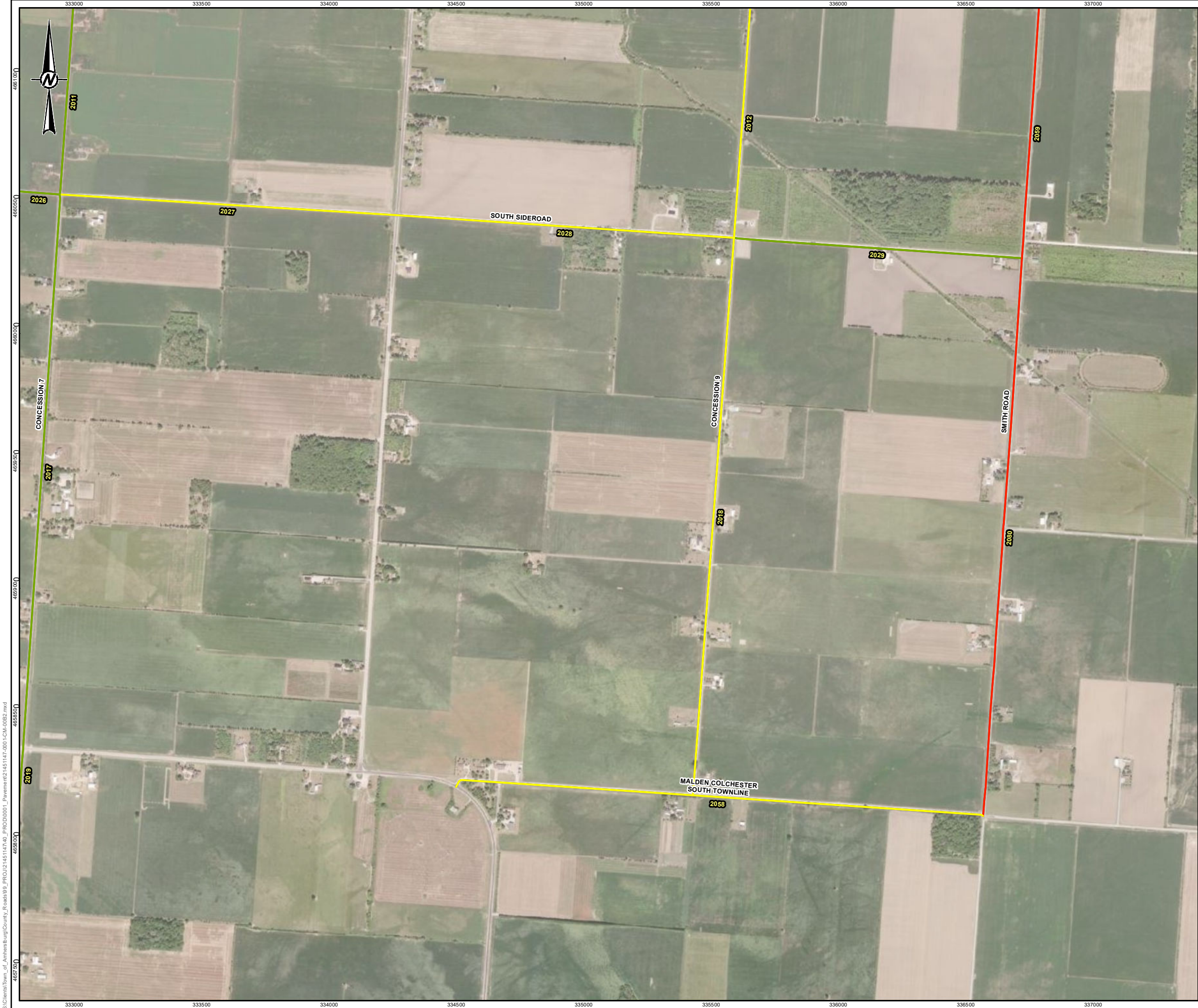
2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-11



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-12



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016

2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-14



LEGEND

ROAD SEGMENT

2021 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 250 500

1:15,000 METRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT


THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2021 ROAD CONDITIONS - DETAIL

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	B2-15

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 28mm

APPENDIX C

Amherstburg Road Inventory for 2021 RNS

2021 Amherstburg Road Needs Study

Asset ID	Name	Start Position	End Position	GIS ID	Length (m)	Area (sq. m)	Functional Class	Roadside Environment	Service Type	Width (m)	Surface Type	AADT	AADT Assessment	Pavement Condition	PCI Assessment Year	DMI	DMI Assessment	IRI	IRI Assessment Year
1001	Eggleton Court	Illinois Street	Culdasac	1001	60.8	541.12	Local	Urban	Residential	8.9	Hot Mix Asphalt	125	2016	43	2021	9.2	2021	7.16	2021
1002	Jones Court	Illinois Street	Culdasac	1002	62.1	552.69	Local	Urban	Residential	8.9	Hot Mix Asphalt	125	2016	76	2021	9.2	2021	8.69	2021
1003	Illinois Street	Kentucky Street	Eggleton Court	1003	157.5	1401.75	Local	Urban	Residential	8.9	Hot Mix Asphalt	800	2016	47	2021	8.3	2021	5.57	2021
1004	Tennessee Crescent	Kentucky Street (north)	Kentucky Street (south)	1004	352.6	3067.62	Local	Urban	Residential	8.7	Hot Mix Asphalt	420	2016	45	2021	9	2021	6.68	2021
1005	Illinois Street	Brush Court	Eggleton Court	1005	373.3	3247.71	Local	Urban	Residential	8.7	Hot Mix Asphalt	800	2016	56	2021	8.3	2021	4.34	2021
1006	Brush Crescent	Illinois Street	Richmond Street	1006	493.2	4340.16	Local	Urban	Residential	8.8	Hot Mix Asphalt	550	2016	57	2021	8.4	2021	4.28	2021
1007	Allen Court	Richmond Street	Culdasac	1007	123.7	1063.82	Local	Urban	Residential	8.6	Hot Mix Asphalt	180	2016	53	2021	9.3	2021	5.88	2021
1008	Kentucky Avenue	Alma Street	Richmond Street	1008	414.4	3688.16	Local	Urban	Residential	8.9	Hot Mix Asphalt	1800	2016	24	2021	6.4	2021	6.33	2021
1009	Reynolds Court	Vermont Drive	Culdasac	1009	223.1	1985.59	Local	Urban	Residential	8.9	Hot Mix Asphalt	250	2016	60	2021	9.3	2021	4.98	2021
1010	Richmond Street	Kentucky Avenue	Vermont Drive	1010	570.3	5246.76	Local	Urban	Residential	9.2	Hot Mix Asphalt	1135	2016	62	2021	8.7	2021	4.06	2021
1011	Vermont Drive	Richmond Street	Indiana Place	1011	446.8	4065.88	Local	Urban	Residential	9.1	Hot Mix Asphalt	2400	2016	45	2021	7.8	2021	5.16	2021
1012	Indiana Place	Richmond Street	Mediterranean Avenue	1012	375	3075	Local	Urban	Residential	8.2	Hot Mix Asphalt	550	2016	47	2021	8.7	2021	6.04	2021
1013	Mediterranean Avenue	Bratt Drive	Culdasac	1013	728.6	6484.54	Local	Urban	Residential	8.9	Hot Mix Asphalt	820	2016	53	2021	7.8	2021	4.18	2021
1014	Mediterranean Avenue	Pacific Avenue	Mediterranean Avenue	1014	100.4	843.36	Local	Urban	Residential	8.4	Hot Mix Asphalt	820	2016	35	2021	9.3	2021	8.33	2021
1015	Richmond Street	Simcoe Street	Vermont Drive	1015	453.2	4214.76	Local	Urban	Residential	9.3	Hot Mix Asphalt	1100	2016	61	2021	8.9	2021	4.35	2021
1016	Bratt Drive	Richmond Street	Simcoe Street	1016	450.6	4010.34	Local	Urban	Residential	8.9	Hot Mix Asphalt	900	2016	59	2021	8.9	2021	4.71	2021
1017	Hairier Court	Bratt Drive	Culdasac	1017	86.8	755.16	Local	Urban	Residential	8.7	Hot Mix Asphalt	200	2016	48	2021	8.9	2021	6.13	2021
1018	Hart Street	Bratt Drive	Richmond Street	1018	169.2	1539.72	Local	Urban	Residential	9.1	Hot Mix Asphalt	500	2016	78	2021	8.5	2021	5.75	2021
1019	Martin Crescent	Simcoe Street	Culdasac	1019	309.8	2571.34	Local	Urban	Residential	8.3	Hot Mix Asphalt	425	2016	65	2021	9.3	2021	4.37	2021
1020	Atlantic Court	Atlantic Avenue	Culdasac	1020	63.1	530.04	Local	Urban	Residential	8.4	Hot Mix Asphalt	325	2016	2	2021	7.8	2021	10.99	2021
1021	Heaton Street	Culdasac	Gibb Street	1021	89.5	724.95	Local	Urban	Residential	8.1	Hot Mix Asphalt	300	2016	22	2021	9.4	2021	10.15	2021
1022	Heaton Street	Culdasac	Culdasac	1022	116.5	955.3	Local	Urban	Residential	8.2	Hot Mix Asphalt	300	2016	26	2021	9.1	2021	9.31	2021
1023	Sullivan Street	Gib Street	Culdesac	1023	125.7	1043.31	Local	Urban	Residential	8.3	Hot Mix Asphalt	225	2016	51	2021	9.1	2021	5.91	2021
1024	Gibb Street	Fryer Street	Culdasac	1024	216.9	1821.96	Local	Urban	Residential	8.4	Hot Mix Asphalt	650	2016	52	2021	8.8	2021	5.45	2021
1025	Baltic Avenue	Gibb Street	Richmond Street	1025	342.9	2811.78	Local	Urban	Residential	8.2	Hot Mix Asphalt	700	2016	30	2021	7.6	2021	7.00	2021
1026	St. Charles Place	Ventnor Avenue	Baltic Avenue	1026	273.3	2241.06	Local	Urban	Residential	8.2	Hot Mix Asphalt	500	2016	41	2021	7.8	2021	5.72	2021
1027	Ventnor Avenue	Baltic Avenue	Ventnor Avenue	1027	236	1982.4	Local	Urban	Residential	8.4	Hot Mix Asphalt	675	2016	37	2021	7.8	2021	6.20	2021
1028	Ventnor Avenue	Ventnor Avenue	Atlantic Avenue	1028	312.2	2591.26	Local	Urban	Residential	8.3	Hot Mix Asphalt	675	2016	26	2021	7.7	2021	7.55	2021
1029	Atlantic Avenue	Culdasac	Pacific Avenue	1029	182	1528.8	Local	Urban	Residential	8.4	Hot Mix Asphalt	300	2016	39	2021	7.8	2021	6.05	2021
1030	Pacific Avenue	Simcoe Street	Mediterranean	1030	364.8	3137.28	Local	Urban	Residential	8.6	Hot Mix Asphalt	950	2016	76	2021	10	2021	3.71	2021
1031	Pacific Avenue	Mediterranean Avenue	Richmond Street	1031	257.9	2166.36	Local	Urban	Residential	8.4	Hot Mix Asphalt	800	2016	90	2021	10	2021	1.78	2021
1032	Richmond Street	States Avenue	Ketucky Avenue	1032	156.5	1314.6	Collector	Urban	Residential	8.4	Hot Mix Asphalt	2200	2016	42	2021	8.7	2021	6.73	2021
1033	Richmond Street	Boardwalk Avenue	States Avenue	1033	278.2	2392.52	Collector	Urban	Residential	8.6	Hot Mix Asphalt	2700	2016	53	2021	7.8	2021	4.10	2021
1034	Richmond Street	Fryer Street	Boardwalk Avenue	1034	284.2	2415.7	Collector	Urban	Residential	8.5	Hot Mix Asphalt	2800	2016	51	2021	7.6	2021	4.09	2021
1035	St. James Crescent	Boardwalk Avenue	Boardwalk Avenue	1035	350.1	2870.82	Local	Urban	Residential	8.2	Hot Mix Asphalt	300	2016	42	2021	7.5	2021	5.24	2021
1036	Boardwalk Avenue	States Avenue	Richmond Street	1036	482.7	4054.68	Local	Urban	Residential	8.4	Hot Mix Asphalt	600	2016	38	2021	7.4	2021	5.63	2021
1037	Riviera Place	Riviera Drive	Culdasac	1037	74	621.6	Local	Urban	Residential	8.4	Hot Mix Asphalt	150	2016	59	2021	10	2021	5.95	2021
1038	Riviera Drive	Boardwalk Avenue	Venetian Drive	1038	250.6	2079.98	Local	Urban	Residential	8.3	Hot Mix Asphalt	350	2016	76	2021	10	2021	3.67	2021
1039	Holiday Court	Venetian Drive	Culdasac	1039	110.5	950.3	Local	Urban	Residential	8.6	Hot Mix Asphalt	200	2016	8	2021	6.6	2021	8.65	2021
1040	Spring Court	Venetian Drive	Culdesac	1040	103	865.2	Local	Urban	Residential	8.4	Hot Mix Asphalt	200	2016	0	2021	7.8	2021	12.82	2021
1041	Amlin Street	Venetian Drive	Culdasac	1041	135.1	1148.35	Local	Urban	Residential	8.5	Hot Mix Asphalt	150	2016	43	2021	9	2021	6.91	2021
1042	Venetian Drive	Alma Street	Fryer Street	1042	576.2	4840.08	Local	Urban	Residential	8.4	Hot Mix Asphalt	700	2016	81	2021	10	2021	3.07	2021
1043	Renaud Street	Alma Street	Culdasac	1043	170.9	1418.47	Local	Urban	Residential	8.3	Hot Mix Asphalt	589	2016	69	2021	9.7	2021	4.33	2021
1044	Tofflemire Street	Alma Street	Culdesac	1044	216.9	1778.58	Local	Urban	Residential	8.2	Hot Mix Asphalt	250	2016	64	2021	9.2	2021	4.31	2021
1045	Main Street North	Culdasac	Alma Street	1045	215.6	1875.72	Local	Urban	Residential	8.7	Hot Mix Asphalt	300	2016	65	2021	9.1	2021	4.11	2021
1046	Marvin Gardens	Virginia Avenue	Culdasac	1046	120	1008	Local	Urban	Residential	8.4	Hot Mix Asphalt	150	2016	13	2021	7.7	2021	9.30	2021
1047	Virginia Avenue	States Avenue	States Avenue	1047	616.8	5057.76	Local	Urban	Residential	8.2	Hot Mix Asphalt	650	2016	35	2021	7.8	2021	6.47	2021
1048	States Avenue	Alma Street	Richmond Street	1048	518.3	4146.4	Local	Urban	Residential	8	Hot Mix Asphalt	950	2016	67	2021	9	2021	3.69	2021
1049	Fryer Street	Alma Street	Fort Street	1049	172.6	1156.42	Local	Semi-Urban	Residential	6.7	Hot Mix Asphalt	2280	2016	30	2021	6.3	2021	5.33	2021
1051	Fryer Street	Military Street	Richmond Street	1051	292.1	1957.07	Local	Semi-Urban	Residential	6.7	Hot Mix Asphalt	2400	2016	59	2021	8.4	2021	4.11	2021
1052	Main Street South	Alma Street	Fort Street	1052	173.7	1493.82	Local	Urban	Residential	8.6	Hot Mix Asphalt	400	2016	66	2021	8.9	2021	3.72	2021
1053	Main Street South	Fort Street	Military Street	1053	144.2	1240.12	Local	Urban	Residential	8.6	Hot Mix Asphalt	400	2016	47	2021	8.1	2021	5.32	2021
1054	Main Street South	Military Street	Culdasac	1054	113.7	977.82	Local	Urban	Residential	8.6	Hot Mix Asphalt	400	2016	44	2021	9.3	2021	7.08	2021
1055	Hamilton Drive	Victoria Street South	Culdasac	1055	176.5	1482.6	Local	Urban	Residential	8.4	Hot Mix Asphalt	275	2016	32	2021	7	2021	5.90	2021
1056	Fryer Street	Fort Street	Military Street	1056	145.8	976.86	Local	Semi-Urban	Residential	6.7	Hot Mix Asphalt	2400	2016	41	2021	6.3	2021	3.98	2021
1057	Richmond Street	Fryer Street	Victoria Street	1057	218.7	1858.95	Collector	Urban	Residential	8.5	Hot Mix Asphalt	2800	2016	79	2021	9.7	2021	2.92	2021
1058	Wilkinson Court	Hamilton Drive	Culdasac	1058	51.1	434.35	Local	Urban	Residential	8.5	Hot Mix Asphalt	275	2016	0	2021	7	2021	11.59	2021
1060	Victoria Street North	Alma Street	End	1060	606.6	5156.1	Local	Urban	Residential	8.5	Hot Mix Asphalt	1100	2016	87	2021	9.3	2021	8.33	2021
1062	Victoria Street South	Alma Street	Military Street	1062	318.9	2933.88	Local	Urban	Residential	9.2	Hot Mix Asphalt	2400	2016	24	2021	7.8	2021	8.04	2021
1063	Victoria Street South	Military Street	Richmond Street	1063	290.8	2704.44	Local	Urban	Residential	9.3	Hot Mix Asphalt	2400	2016	60	2021	8.9	2021	4.48	2021
1064	Military Street	Fryer Street	Victoria Street	1064	221.8	1863.12	Local	Urban	Residential	8.4	Hot Mix Asphalt	450	2016	51	2021	8.5	2021	5.28	2021
1065	Fort Street	Fryer Street	Victoria Street	1065	226.2	1967.94	Local	Urban	Residential	8.7	Hot Mix Asphalt	800	2016	60	2021	9.3	2021	4.94	2021
1066	Victoria Street South	Richmond Street	Simcoe Street	1066	583.7	6070.48	Local	Urban	Residential	10.4	Hot Mix Asphalt	2400	2016	68	2021	8.9	2021	3.50	2021
1067	St. Arnaud Street	Balaclava Street	Victoria Street South	1067	481.7	3131.05	Local	Semi-Urban	Residential	6.5	Hot Mix Asphalt	600	2016	69	2021	8.6	2021	2.96	2021
1068	St. Arnaud Street	Sandwich Street North	Bertrand Street	1068	406.1	3533.07	Local	Urban	Residential	8.7	Hot Mix Asphalt	600	2016	74	2021	9.3	2021	3.13	2021
1069	Balaclava Street	St. Arnaud Street	Alma Street	1069	222.7	1581.17	Local	Urban	Residential	7.1	Hot Mix Asphalt	1100	2016	66	2021	8.5	2021	3.30	2021
1070	Bertrand Avenue	Alma Street	St. Arnaud Street	1070	223.5	1609.2	Local	Semi-Urban	Residential	7.2	Hot Mix Asphalt	800	2016	27	2021	7.5	2021	7.20	2021
1071	Balaclava Street	Alma Street	Fort Street	1071	324.1	2301.11	Local	Urban	Residential	7.1	Hot Mix Asphalt	950	2016	56	2021	7.9	2021	3.80	2021
1072	Balaclava Street	Fort Street	Richmond Street	1072	430.3	3657.55	Local	Urban	Residential	8.5	Hot Mix Asphalt	950	2016	42	2021	7.3	2021	4.90	2021
1074	Alma Street	Sandwich Street North	Balaclava Street	1074	387.8	3257.52	Collector	Urban	Residential	8.4	Hot Mix Asphalt	5500	2016	55	2021	7.1	2021	3.10	2021
1075	Richmond Street	Victoria Street	Balaclava Street South	1075	423	3680.1	Collector	Urban	Residential	8.7	Hot Mix Asphalt	3500	2016	49	2021	8.3	2021	5.26	2021
1076	Richmond Street	Balaclava Street	Sandwich Street South	107															

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1081	Dalhousie Street	Richmond Street	Fort Malden Dr	1081	378.5	3860.7	Local	Urban	Residential	10.2	Hot Mix Asphalt	2100	2016	45	2021	8.1	2021	5.62	2021
1082	Laird Avenue South	North Street	Maple Avenue	1082	281	2416.6	Local	Urban	Residential	8.6	Hot Mix Asphalt	1800	2016	67	2021	9.3	2021	4.00	2021
1083	Laird Avenue South	Maple Avenue	Alma Street	1083	386.9	4836.25	Local	Urban	Residential	12.5	Hot Mix Asphalt	1800	2016	72	2021	9.3	2021	3.40	2021
1084	Elm Street	Laird Avenue South	Sandwich Street South	1084	145.6	946.4	Local	Urban	Residential	6.5	Hot Mix Asphalt	400	2016	84	2021	9.2	2021	1.60	2021
1085	Maple Avenue	Sandwich Street	Laird Avenue	1085	149.7	1137.72	Local	Urban	Residential	7.6	Hot Mix Asphalt	400	2016	58	2021	9.2	2021	5.10	2021
1088	Laird Avenue North	Alma Street	Culdasac	1088	121.5	899.1	Local	Urban	Residential	7.4	Hot Mix Asphalt	300	2016	11	2021	7.7	2021	9.70	2021
1090	Murray Street	Wolfe Street	Victoria Street South	1090	129.1	826.24	Local	Urban	Residential	6.4	Hot Mix Asphalt	800	2016	30	2021	8.8	2021	8.43	2021
1091	Murray Street	George Street	Brock Street	1091	96.1	605.43	Local	Urban	Residential	6.3	Hot Mix Asphalt	800	2016	29	2021	9.5	2021	9.37	2021
1092	Murray Street	King Street	George Street	1092	103.2	670.8	Local	Urban	Residential	6.5	Hot Mix Asphalt	800	2016	16	2021	8.7	2021	10.19	2021
1093	Murray Street	Seymour Street	King Street	1093	99.3	625.59	Local	Urban	Residential	6.3	Hot Mix Asphalt	800	2016	26	2021	8.5	2021	8.51	2021
1094	Murray Street	Sandwich Street South	Seymour Street	1094	102.3	644.49	Local	Urban	Residential	6.3	Hot Mix Asphalt	800	2016	15	2021	9	2021	10.59	2021
1095	Murray Street	Bathurst Street	Sandwich Street South	1095	100.8	604.8	Local	Urban	Residential	6	Hot Mix Asphalt	800	2016	93	2021	9.8	2021	7.00	2021
1096	Murray Street	Ramsay Street	Bathurst Street	1096	99.2	634.88	Local	Urban	Residential	6.4	Hot Mix Asphalt	800	2016	89	2021	9.3	2021	6.85	2021
1097	Murray Street	Dalhousie Street	Ramsay Street	1097	95.4	677.34	Local	Urban	Residential	7.1	Hot Mix Asphalt	800	2016	52	2021	9.5	2021	6.28	2021
1098	Wolfe Street	Richmond Street	Hamilton Drive	1098	200.8	1204.8	Local	Urban	Residential	6	Hot Mix Asphalt	520	2016	56	2021	9.3	2021	5.47	2021
1099	Wolfe Street	Hamilton Drive	Brock Street	1099	200.8	1305.2	Local	Urban	Residential	6.5	Hot Mix Asphalt	520	2016	67	2021	9.1	2021	3.78	2021
1100	Gore Street	King Street	George Street	1100	97.6	722.24	Local	Urban	Residential	7.4	Hot Mix Asphalt	800	2016	24	2021	8.4	2021	8.78	2021
1101	Gore Street	Sandwich Street South	Seymour Street	1101	102.1	755.54	Local	Urban	Residential	7.4	Hot Mix Asphalt	800	2016	21	2021	8.2	2021	8.90	2021
1102	Gore Street	Bathurst Street	Ramsay Street	1102	101.5	639.45	Local	Urban	Residential	6.3	Paver Interlock	800	2016	35	2021	10	2021	6.40	2021
1103	Dalhousie Street	Gore Street	Park Street	1103	162.2	1216.5	Local	Urban	Residential	7.5	Hot Mix Asphalt	2600	2016	89	2021	9.7	2021	4.68	2021
1105	Dalhousie Street	Gore Street	Murray Street	1105	130	1222	Local	Urban	Residential	9.4	Hot Mix Asphalt	2600	2016	55	2021	8.8	2021	5.08	2021
1106	Ramsay Street	Park Street	Richmond Street	1106	409.7	3236.63	Local	Urban	Residential	7.9	Hot Mix Asphalt	800	2016	72	2021	9.9	2021	4.10	2021
1107	Bathurst Street	Murray Street	Gore Street	1107	129.2	969	Local	Urban	Residential	7.5	Hot Mix Asphalt	800	2016	57	2021	9.4	2021	5.51	2021
1108	Forhan Street	Fort St	Culdasac	1108	205.5	1767.3	Local	Urban	Residential	8.6	Hot Mix Asphalt	1400	2016	72	2021	9.4	2021	3.50	2021
1109	Seymour Street	Simcoe Street	Murray Street	1109	310.8	2362.08	Local	Urban	Residential	7.6	Hot Mix Asphalt	700	2016	33	2021	8.2	2021	7.26	2021
1110	King Street	Gore Street	Simcoe Street	1110	212.5	1636.25	Local	Urban	Residential	7.7	Hot Mix Asphalt	250	2016	76	2021	9.6	2021	3.18	2021
1111	George Street	Simcoe Street	Gore Street	1111	242.7	2014.41	Local	Urban	Residential	8.3	Hot Mix Asphalt	700	2016	31	2021	7.8	2021	7.12	2021
1112	Brock Street	Gore Street	Richmond Street	1112	218.8	1422.2	Local	Urban	Residential	6.5	Hot Mix Asphalt	550	2016	19	2021	7	2021	7.64	2021
1113	Brock Street	Simcoe Street	Gore Street	1113	266.9	2241.96	Local	Urban	Residential	8.4	Hot Mix Asphalt	550	2016	48	2021	9.1	2021	6.36	2021
1114	Kempt Street	Brock Street	Simcoe Street	1114	272.8	1691.36	Local	Semi-Urban	Residential	6.2	Hot Mix Asphalt	400	2016	62	2021	9.6	2021	5.15	2021
1117	Bathurst Street	Park Street	Gore Street	1117	223.9	1880.76	Local	Urban	Residential	8.4	Hot Mix Asphalt	600	2016	67	2021	9.5	2021	4.28	2021
1118	Fort Street	Victoria Street South	Balaclava Street	1118	454.5	3908.7	Local	Urban	Residential	8.6	Hot Mix Asphalt	1000	2016	56	2021	7.6	2021	3.40	2021
1119	Seymour Street	Park Street	Simcoe Street	1119	114.9	781.32	Local	Urban	Residential	6.8	Hot Mix Asphalt	600	2016	48	2021	7.6	2021	4.50	2021
1120	King Street	Simcoe Street	Park Street	1120	116.4	814.8	Local	Urban	Residential	7	Hot Mix Asphalt	600	2016	53	2021	8.9	2021	5.49	2021
1121	Park Street	Sandwich Street South	Dalhousie Street	1121	285	2166	Local	Semi-Urban	Residential	7.6	Hot Mix Asphalt	800	2016	60	2021	8.9	2021	4.52	2021
1122	Park Street	Culdasac	Sandwich Street South	1122	312.3	1998.72	Local	Urban	Residential	6.4	Hot Mix Asphalt	600	2016	70	2021	9.5	2021	3.85	2021
1123	King Street	Park Street	Culdasac	1123	345.7	2350.76	Local	Urban	Residential	6.8	Hot Mix Asphalt	500	2016	23	2021	7.2	2021	7.40	2021
1125	Fryer Street	Gibb Street	Richmond Street	1125	338.3	2774.06	Local	Semi-Urban	Residential	8.2	Hot Mix Asphalt	2000	2016	61	2021	7.9	2021	3.17	2021
1126	Fryer Street	Simcoe Street	Gibb Street	1126	242.8	1990.96	Local	Rural	Residential	8.2	Hot Mix Asphalt	1800	2016	55	2021	8.4	2021	4.57	2021
1131	Victoria Street South	Simcoe Street	Cherrylawn Crescent	1131	205.6	1603.68	Local	Urban	Residential	7.8	Hot Mix Asphalt	1800	2016	16	2021	6.7	2021	7.69	2021
1132	Cherrylawn Crescent	Pickering Drive	Pickering Drive	1132	559.4	4139.56	Local	Urban	Residential	7.4	Hot Mix Asphalt	700	2016	67	2021	8.9	2021	3.56	2021
1133	Hawthorn Crescent	Pickering Drive	Pickering Drive	1133	620.9	5029.29	Local	Urban	Residential	8.1	Hot Mix Asphalt	700	2016	49	2021	7.8	2021	4.65	2021
1134	Victoria Street South	Cherrylawn Crescent	Pickering Drive	1134	91.7	715.26	Local	Urban	Residential	7.8	Hot Mix Asphalt	900	2016	15	2021	6.7	2021	7.90	2021
1135	Pickering Drive	Fryer Street	Cherrylawn Crescent	1135	484.8	4072.32	Local	Urban	Residential	8.4	Hot Mix Asphalt	1600	2016	84	2021	10	2021	2.69	2021
1136	Pickering Drive	Sandwich Street South	King Street	1136	193	1621.2	Local	Urban	Residential	8.4	Hot Mix Asphalt	2500	2016	79	2021	10	2021	3.31	2021
1137	Pickering Drive	Sandwich Street South	Dalhousie Street	1137	378.1	4007.86	Local	Urban	Residential	10.6	Hot Mix Asphalt	2000	2016	72	2021	9.6	2021	3.72	2021
1138	McCurdy Drive	Sandwich Street South	Oak Court	1138	249.9	2149.14	Local	Urban	Residential	8.6	Hot Mix Asphalt	700	2016	33	2021	8.1	2021	7.19	2021
1139	McCurdy Drive	Oak Court	Walnut Drive	1139	292.9	2460.36	Local	Urban	Residential	8.4	Hot Mix Asphalt	800	2016	38	2021	7.8	2021	6.17	2021
1140	McCurdy Drive	Walnut Drive	Fryer Street	1140	256.9	2209.34	Local	Urban	Residential	8.6	Hot Mix Asphalt	800	2016	42	2021	7.9	2021	5.76	2021
1141	Linden Crescent	McCurdy Drive	Culdasac	1141	104	873.6	Local	Urban	Residential	8.4	Hot Mix Asphalt	150	2016	5	2021	7.4	2021	10.02	2021
1142	Oak Court	McCurdy Drive	Culdasac	1142	78.4	580.16	Local	Urban	Residential	7.4	Hot Mix Asphalt	200	2016	14	2021	7.9	2021	9.43	2021
1143	Lilac Court	McCurdy Drive	Culdasac	1143	80.2	569.42	Local	Urban	Residential	7.1	Hot Mix Asphalt	150	2016	0	2021	7	2021	10.52	2021
1144	Poplar Court	McCurdy Drive	Culdasac	1144	76.4	657.04	Local	Urban	Residential	8.6	Hot Mix Asphalt	150	2016	0	2021	7.4	2021	12.15	2021
1145	Walnut Drive	Hawthorn Crescent	McCurdy Drive	1145	175.8	1511.88	Local	Urban	Residential	8.6	Hot Mix Asphalt	500	2016	83	2021	10	2021	2.73	2021
1146	Briar Ridge Avenue	Fryer Street	Crownridge Boulevard	1146	355.9	2953.97	Local	Urban	Residential	8.3	Hot Mix Asphalt	800	2016	56	2021	9.1	2021	5.23	2021
1147	Fern Ridge Court	Briar Ridge Avenue	Culdasac	1147	84.3	615.39	Local	Urban	Residential	7.3	Hot Mix Asphalt	150	2016	43	2021	9.4	2021	7.37	2021
1148	Deer Ridge Court	Crownridge Boulevard	Culdasac	1148	91.8	660.96	Local	Urban	Residential	7.2	Hot Mix Asphalt	250	2016	30	2021	9.3	2021	9.00	2021
1149	Cedar Ridge Avenue	Culdasac	Thorn Ridge Avenue	1149	152.9	1162.04	Local	Urban	Residential	7.6	Hot Mix Asphalt	350	2016	38	2021	9.1	2021	7.67	2021
1150	Crownridge Boulevard	Briar Ridge Avenue	Fryer Street	1150	275	2365	Local	Urban	Residential	8.6	Hot Mix Asphalt	600	2016	46	2021	8.3	2021	5.65	2021
1151	Autumn Ridge Avenue	Crownridge Boulevard	Stone Ridge Avenue	1151	126.1	933.14	Local	Urban	Residential	7.4	Hot Mix Asphalt	350	2016	43	2021	9.3	2021	7.29	2021
1152	Summer Ridge Court	Autumn Ridge Avenue	Culdesac	1152	114.2	833.66	Local	Urban	Residential	7.3	Hot Mix Asphalt	250	2016	42	2021	9.3	2021	7.45	2021
1153	Stone Ridge Avenue	Autumn Ridge Avenue	Crownridge Boulevard	1153	261.9	1938.06	Local	Urban	Residential	7.4	Hot Mix Asphalt	700	2016	43	2021	8.8	2021	6.60	2021
1154	Castle Ridge Court	Stone Ridge Avenue	Culdasac	1154	52.3	381.79	Local	Urban	Residential	7.3	Hot Mix Asphalt	150	2016	47	2021	9.3	2021	6.67	2021
1155	Royal Ridge Court	Crownridge Boulevard	Culdasac	1155	38.9	307.31	Local	Urban	Residential	7.9	Hot Mix Asphalt	150	2016	33	2021	9.8	2021	9.20	2021
1156	Crownridge Boulevard	Pine Ridge Avenue	Briar Ridge Avenue	1156	214.3	1842.98	Local	Urban	Residential	8.6	Hot Mix Asphalt	900	2016	38	2021	8.3	2021	6.68	2021
1157	Pine Ridge Avenue	Crownridge Boulevard	Culdasac	1157	116	858.4	Local	Urban	Residential	7.4	Hot Mix Asphalt	300	2016	38	2021	8	2021	6.33	2021
1158	Ridgeview Place North	Crownridge Boulevard	Thorn Ridge Avenue	1158	195.5	1407.6	Local	Urban	Residential	7.2	Hot Mix Asphalt	500	2016	17	2021	7.2	2021	8.20	2021
1159	Crownridge Boulevard	Pine Ridge Avenue	Sandwich Street South	1159	286.9	2094.37	Local	Urban	Residential	7.3	Hot Mix Asphalt	1500	2016	13	2021	7.4	2021	9.04	2021
1160	Thorn Ridge Crescent	Thorn Ridge Avenue	Crownridge Avenue	1160	743	5498.2	Local	Urban	Residential	7.4	Hot Mix Asphalt	1200	2016	62	2021	7.8	2021	3.00	2021
1161	Ridgeview Place South	Crownridge Boulevard	Culdasac	1161	162.5	1170	Local	Urban	Residential	7.2	Hot Mix Asphalt	1100	2016	77	2021	8.9	2021	6.54	2021
1164	Dalhousie Street	Park Street	Pickering Street	1164	258.4	1860.48	Local	Urban	Residential	7.2	Hot Mix Asphalt	1500	2016	62	2021	9.4	2021	4.82	2021
1165	Dalhousie Street	Pickering Street	Bastien Street	1165	1014.9	6190.89	Local	Urban	Residential	6.1	Hot Mix Asphalt	1700	2016	61	2021	8	2021	3.25	2021
1166	Bastien Street	Dalhousie Street	Culdasac	116															

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1173	Brunner Avenue	Sandwich Street North	Girard Street	1173	457.3	3658.4	Local	Urban	Residential	8	Hot Mix Asphalt	500	2016	56	2021	8.1	2021	4.08	2021
1174	Grant Avenue	Girard Street	Sandwich Street North	1174	437.5	3500	Local	Urban	Residential	8	Hot Mix Asphalt	500	2016	65	2021	9.1	2021	4.10	2021
1175	Duff Avenue	Sandwich Street North	Girard Street	1175	422.4	3970.56	Local	Urban	Residential	9.4	Hot Mix Asphalt	450	2016	54	2021	8.5	2021	4.77	2021
1176	Queen Street	William Street	Duff Avenue	1176	190.6	1486.68	Local	Urban	Residential	7.8	Hot Mix Asphalt	400	2016	61	2021	9.2	2021	4.79	2021
1177	Fraser Ave	Grant Ave	Brunner Avenue	1177	100.1	840.84	Local	Urban	Residential	8.4	Hot Mix Asphalt	400	2016	61	2021	9.4	2021	4.93	2021
1178	Girard Street	Brunner Avenue	William Street	1178	391.5	3366.9	Local	Urban	Residential	8.6	Hot Mix Asphalt	400	2016	57	2021	8.3	2021	4.22	2021
1179	William Street	Girard Street	Sandwich Street North	1179	424.7	3397.6	Local	Urban	Residential	8	Hot Mix Asphalt	450	2016	56	2021	7.9	2021	3.91	2021
1180	Boblo Island Boulevard	Ferry Docking	Crystal Bay Drive	1180	481.2	3753.36	Collector	Semi-Urban	Residential	7.8	Hot Mix Asphalt	300	2016	29	2021	6.5	2021	5.75	2021
1181	Crystal Bay Drive	Boblo Island Boulevard	Gold Coast Drive	1181	832.2	6491.16	Local	Semi-Urban	Residential	7.8	Hot Mix Asphalt	250	2016	45	2021	6.9	2021	4.14	2021
1182	Red Oak Crescent	Boblo Island Boulevard	Bobio Island Boulevard	1182	119.8	742.76	Local	Semi-Urban	Residential	6.2	Paver Interlock	250	2016	37	2021	10	2021	6.20	2021
1183	Gold Coast Drive	Bob-Lo Island Blvd	Crystal Bay Drive	1183	605.6	4723.68	Local	Semi-Urban	Residential	7.8	Hot Mix Asphalt	250	2016	42	2021	7.8	2021	5.54	2021
1184	Dalhousie Street	Richmond Street	Murray Street	1184	89.4	840.36	Local	Urban	Commercial	9.4	Hot Mix Asphalt	2600	2016	93	2021	9.8	2021	10.76	2021
1185	Gore Street	Seymour Street	King Street	1185	97.8	723.72	Local	Urban	Commercial	7.4	Hot Mix Asphalt	800	2016	25	2021	8.8	2021	9.10	2021
1186	Alma Street	Sandwich Street	Culdasac	1186	201.1	1608.8	Local	Urban	Residential	8	Hot Mix Asphalt	1800	2016	100	2021	9.8	2021	0.00	2021
1187	King Street	Richmond Street	Gore Street	1187	216.6	1732.8	Local	Urban	Residential	8	Hot Mix Asphalt	800	2016	70	2021	9.3	2021	3.70	2021
1188	George Street	Richmond Street	Gore Street	1188	215.6	1789.48	Local	Urban	Residential	8.3	Hot Mix Asphalt	750	2016	68	2021	7.6	2021	10.24	2021
1189	Gore Street	George Street	Brock Street	1189	99.2	734.08	Local	Urban	Residential	7.4	Hot Mix Asphalt	800	2016	72	2021	8.4	2021	11.32	2021
1190	Gore Street	Sandwich Street	Bathurst Street	1190	101.7	640.71	Local	Urban	Residential	6.3	Paver Interlock	800	2016	40	2021	10	2021	5.92	2021
1191	Bathurst Street	Richmond Street	Murray Street	1191	86.2	922.34	Local	Urban	Residential	10.7	Hot Mix Asphalt	750	2016	87	2021	9.3	2021	10.75	2021
1192	Riverfront Park Crescent	Sandwich Street	Sandwich Street	1192	276.7	2213.6	Local	Urban	Residential	8	Hot Mix Asphalt	700	2016	56	2021	9.6	2021	5.91	2021
1193	River Walk Crescent	Gold Coast Drive	Gold Coast Drive	1193	263.4	2107.2	Local	Urban	Residential	8	Hot Mix Asphalt	300	2016	67	2021	8.8	2021	3.50	2021
1194	Gore Street	Ramsay Street	Dalhousie Street	1194	97.1	582.6	Local	Urban	Residential	6	Paver Interlock	800	2016	18	2021	10	2021	8.00	2021
1195	Fort Malden Dr	Dalhousie	Laird	1195	156.9	941.4	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	2000	2016	60	2021	7.8	2021	3.30	2021
1196	Pickering Drive	King Street	Cherrylawn Cr	1196	116.7	980.28	Local	Urban	Residential	8.4	Hot Mix Asphalt	2500	2016	84	2021	10	2021	2.63	2021
1197	Fort Street	Balaclava Street	Sandwich Street South	1197	375.7	3381.3	Local	Urban	Residential	9	Hot Mix Asphalt	1400	2016	58	2021	8.2	2021	3.40	2021
1198	Heaton Street	Culdasac	Gibb Street	1198	55	451	Local	Urban	Residential	8.2	Hot Mix Asphalt	300	2016	20	2021	9.2	2021	10.24	2021
1199	Seymour Street	Richmond Street	Murray Street	1199	85.2	647.52	Local	Urban	Residential	7.6	Hot Mix Asphalt	700	2016	0	2021	7.2	2021	12.96	2021
1200	Wilkinson Court	Hamilton Drive	Culdasac	1200	110	880	Local	Urban	Residential	8	Hot Mix Asphalt	250	2016	0	2021	7	2021	10.17	2021
1201	Briar Ridge Avenue	Cedar Ridge Ave	Crownridge Boulevard	1201	174.2	1393.6	Local	Urban	Residential	8	Hot Mix Asphalt	600	2016	67	2021	8.9	2021	3.57	2021
1202	Fraser Ave	Grant Ave	Duff Ave	1202	100.7	805.6	Local	Urban	Residential	8	Hot Mix Asphalt	400	2016	89	2021	9.5	2021	6.02	2021
1203	Fraser Ave	Duff Ave	William St	1203	191.3	1530.4	Local	Urban	Residential	8	Hot Mix Asphalt	400	2016	69	2021	9.4	2021	3.85	2021
1204	Murray Street	Brock Street	End	1204	48.3	304.29	Local	Semi-Urban	Residential	6.3	Hot Mix Asphalt	800	2016	38	2021	9.6	2021	8.23	2021
2002	Concession 4 South	Alma Street	Essex County Road 18 (Pike Road)	2002	1194.5	7644.8	Local	Rural	Residential	6.4	Surface Treated	800	2016	77	2021	8.1	2021	1.65	2021
2003	Concession 5 South	Essex County Road 18 (Pike Road)	Alma Street	2003	1199.8	7798.7	Local	Rural	Residential	6.5	Surface Treated	450	2016	57	2021	6.6	2021	2.83	2021
2004	Concession 6 South	Alma Street	Essex County Road 18 (Pike Road)	2004	1219.2	8046.72	Local	Rural	Residential	6.6	Hot Mix Asphalt	900	2016	55	2021	6.8	2021	2.68	2021
2005	Concession 7	Essex County Road 18 (Pike Road)	Alma Street	2005	1247.2	7607.92	Local	Rural	Residential	6.1	Surface Treated	500	2016	77	2021	8.8	2021	2.67	2021
2006	Concession 9	Alma Street	Essex County Road 18 (Pike Road)	2006	1252.8	6890.4	Local	Rural	Residential	5.5	Gravel	90	2016	65	2021		2021		2021
2007	Meloche Road	Lowes Sideroad	Essex County Road 18	2007	1290.1	9417.73	Local	Rural	Residential	7.3	Hot Mix Asphalt	900	2016	88	2021	10	2021	2.04	2021
2008	Concession 4 South	Essex County Road 18 (Pike Road)	South Sideroad	2008	1922.8	12305.92	Local	Rural	Residential	6.4	Surface Treated	700	2016	68	2021	7.7	2021	2.63	2021
2009	Concession 5 South	South Sideroad	Essex County Road 18 (Pike Road)	2009	1928.2	11954.84	Local	Rural	Residential	6.2	Surface Treated	500	2016	58	2021	6.6	2021	2.50	2021
2010	Concession 6 South	Essex County Road 18 (Pike Road)	South Sideroad	2010	1914.7	12637.02	Local	Rural	Residential	6.6	Hot Mix Asphalt	1200	2016	35	2021	5.9	2021	4.24	2021
2011	Concession 7	South Sideroad	Essex County Road 18 (Pike Road)	2011	1940.9	12227.67	Local	Rural	Residential	6.3	Surface Treated	300	2016	78	2021	8.5	2021	1.99	2021
2012	Concession 9	EssexCounty Road 18 (Pike Road)	South Sideroad	2012	1926.8	10597.4	Local	Rural	Residential	5.5	Gravel	90	2016	50	2021		2021		2021
2013	Creek Road	County Road 20	South Sideroad	2013	2115.5	14808.5	Local	Rural	Residential	7	Hot Mix Asphalt	500	2016	92	2021	10	2021	1.57	2021
2014	Concession 4 South	Middle Sideroad - Malden	Essex County Road 20	2014	1954.1	12701.65	Local	Rural	Residential	6.5	Surface Treated	700	2016	69	2021	7.6	2021	2.23	2021
2015	Concession 5 South	Essex County Road 20	South Sideroad	2015	1966.4	12191.68	Local	Rural	Residential	6.2	Surface Treated	325	2016	72	2021	8.2	2021	2.60	2021
2017	Concession 7	Essex County Road 20	Middle Sideroad - Malden	2017	2179.8	13732.74	Local	Rural	Residential	6.3	Surface Treated	270	2016	66	2021	7.1	2021	1.98	2021
2018	Concession 9	South Sideroad	Malden/Colchester South Townline	2018	2196.2	12079.1	Local	Rural	Residential	5.5	Gravel	90	2016	60	2021		2021		2021
2019	Concession 7	Essex County Road 20	Collison Sideroad	2019	1924.7	10585.85	Local	Rural	Residential	5.5	Gravel	100	2016	70	2021		2021		2021
2020	Concession 7	Collison Sideroad	Essex County Road 50	2020	930	5115	Local	Rural	Residential	5.5	Gravel	100	2016	60	2021		2021		2021
2021	Concession 3 South	County Road 20	Mcleod Avenue	2021	2136.2	14312.54	Local	Rural	Residential	6.7	Surface Treated	120	2016	81	2021	8.8	2021	2.04	2021
2022	South Sideroad	Creek Road	Concession 4 North	2022	1136.3	6931.43	Local	Rural	Residential	6.1	Surface Treated	450	2016	88	2021	9.5	2021	1.93	2021
2023	Creek Road	South Sideroad	Lowes Sideroad	2023	700.9	4906.3	Local	Rural	Residential	7	Hot Mix Asphalt	450	2016	89	2021	10	2021	2.01	2021
2024	South Sideroad	Concession 4 South	Concession 5 South	2024	1351.4	8513.82	Local	Rural	Residential	6.3	Surface Treated	3000	2016	72	2021	7.8	2021	2.04	2021
2025	South Sideroad	Concession 5 South	Concession 6 South	2025	1308.6	8244.18	Local	Rural	Residential	6.3	Surface Treated	2900	2016	89	2021	9.4	2021	1.47	2021
2026	South Sideroad	Concession 6 South	Concession 7	2026	1319.4	8708.04	Local	Rural	Residential	6.6	Surface Treated	2900	2016	70	2021	7.9	2021	2.50	2021
2027	South Sideroad	Concession 7	Essex County Road 9 (Howard Avenue)	2027	1324.5	7284.75	Local	Rural	Residential	5.5	Gravel	2900	2016	60	2021		2021		2021
2028	South Sideroad	Essex County Road 9 (Howard Avenue)	Concession 9	2028	1327.4	7300.7	Local	Rural	Residential	5.5	Gravel	2200	2016	60	2021		2021		2021
2029	South Sideroad	Concession 9	Colchester South I Malden Townline	2029	1133.9	6236.45	Local	Rural	Residential	5.5	Gravel	2200	2016	65	2021		2021		2021
2030	St. Therese Avenue	Essex County Road 20	Woodside Avenue	2030	201.5	1450.8	Local	Urban	Residential	7.2	Hot Mix Asphalt	240	2016	73	2021	10	2021	4.12	2021
2031	Woodside Avenue	St. Therese Avenue	Culdasac	2031	71.4	528.36	Local	Urban	Residential	7.4	Hot Mix Asphalt	175	2016	77	2021	10	2021	3.59	2021
2032	Durango Avenue	St. Therese Avenue	Culdasac	2032	81.1	592.03	Local	Urban	Residential	7.3	Hot Mix Asphalt	150	2016	64	2021	10	2021	5.40	2021
2033	Collision Sideroad	Essex County Road 41	Concession 7 South	2033	1869.2	9719.84	Local	Rural	Residential	5.2	Surface Treated	150	2016	68	2021	7.4	2021	2.09	2021
2034	Collison Sideroad	Concession 7	Essex County Road 50	2034	1076.9	4415.29	Local	Rural	Residential	4.1	Surface Treated	150	2016	70	2021	7.4	2021	1.77	2021
2035	Lowes Sideroad	Meloche Road	Fryer Street	2035	1316.2	8818.54	Local	Rural	Residential	6.7	Surface Treated	950	2016	49	2021	5.5	2021	2.43	2021
2036	Lowes Sideroad	Fryer Street	Sandwich Street (County Road 20)	2036	798.2	5347.94	Local	Rural	Residential	6.7	Surface Treated	1100	2016	58	2021	7.2	2021	3.58	2021
2037	Lowes Sideroad	Sandwich Street South (Essex County Road 20)	Dalhousie Street	2037	209.5	1173.2	Local	Rural	Residential	5.6	Surface Treated	600	2016	70	2021	9.6	2021	5.28	2021
2039	Beaudoin Sideroad	Front Road South	Culdasac	2039	69	186.3	Local	Semi-Urban	Residential	2.7	Gravel	75	2016	60	2021		2021		2021
2040	Goodview Avenue	Front Road South	Cooper Lane	2040	196.2	1000.62	Local	Semi-Urban	Residential	5.1	Hot Mix Asphalt	250	2016	55	2021	8.1	2021	4.30	2021
2041	Cooper Lane	Front Road South	Lakebeach Rd	2041	129.4	672.88	Local	Semi-Urban	Residential	5.2	Hot Mix Asphalt	300	2016	53	2021	9.3	2021	5.87	2021
2042	Lakebeach Road	Front Road South	End	2042	131.2	721.6	Local	Semi-Urban	Residential	5.5	Hot Mix Asphalt	250	2016	42	2021	8.1	2021	5.96	2021
2043	Woodbridge Drive	Front Road South	C																

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2051	Concession 5 South	Essex County Road 20	Culdasac	2051	1085	5967.5	Local	Rural	Residential	5.5	Gravel	125	2016	75	2021		2021		2021
2053	Lakeside Drive	Cuidasac (west)	Private Lane	2053	1854.7	5564.1	Local	Rural	Residential	3	Surface Treated	100	2016	52	2021	6.6	2021	3.60	2021
2056	Levergood Lane	Culdasac (east)	Culdasac (west)	2056	220.6	1058.88	Local	Rural	Residential	4.8	Surface Treated	150	2016	66	2021	9.3	2021	5.49	2021
2057	Meadows Lane	Essex County Road 50	Culdasac	2057	288	1728	Local	Semi-Urban	Residential	6	Surface Treated	150	2016	73	2021	9.3	2021	4.18	2021
2058	Malden Colchester South Townline	Colchester South I Malden Town line	Essex County Road 20	2058	2089.8	11075.94	Local	Rural	Residential	5.3	Gravel	550	2016	60	2021		2021		2021
2059	Smith Road	Middle Sideroad - Malden	Essex County Road 18 (Pike Road)	2059	1931.3	7242.375	Local	Rural	Residential	3.75	Surface Treated	550	2016	18	2021	4	2021		2021
2060	Knapps Island Road	Essex County Road 20	Culdasac	2060	1805.3	11734.45	Local	Rural	Residential	6.5	Gravel	75	2016	75	2021		2021		2021
2061	Tilford Lane	Essex Blvd	Concession 3 South	2061	312.1	1872.6	Local	Urban	Residential	6	Hot Mix Asphalt	200	2016	74	2021	9.5	2021	3.43	2021
2062	Victoria Lane	Claremont Lane	Culdasac	2062	93.5	345.95	Local	Semi-Urban	Residential	3.7	Hot Mix Asphalt	150	2016	77	2021	8.9	2021	0.00	2021
2063	Essex Boulevard	McLeod Avenue	Culdasac	2063	331.3	1987.8	Local	Urban	Residential	6	Hot Mix Asphalt	300	2016	62	2021	7.9	2021	3.10	2021
2064	Elmstead Lane	Tilford Lane	Claremont Lane	2064	133.9	803.4	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	120	2016	79	2021	8.7	2021	1.80	2021
2065	Woodland Lane	Claremont Dr	Culdasac	2065	79	474	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	150	2016	54	2021	8.9	2021	5.29	2021
2066	Lake Erie Drive	Tilford Lane	Mcleod Avenue	2066	157.1	942.6	Local	Urban	Residential	6	Hot Mix Asphalt	250	2016	73	2021	9.9	2021	3.95	2021
2067	Willow Beach Road	Concession 3 North	Culdasac	2067	573.4	3440.4	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	250	2016	53	2021	7.2	2021	3.47	2021
2068	Claremont Lane	Tilford Lane	Mcleod Avenue	2068	159.1	954.6	Local	Urban	Residential	6	Hot Mix Asphalt	250	2016	75	2021	9.1	2021	2.70	2021
2069	Lakewood Drive	Mcleod Avenue	Ridgewood Lane	2069	531.5	3189	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	200	2016	39	2021	6.2	2021	4.06	2021
2070	Lakewood Drive	Mcleod Avenue	Culdasac (MN # 534)	2070	1246.2	7477.2	Local	Semi-Urban	Residential	6	Hot Mix Asphalt	200	2016	53	2021	7.3	2021	3.48	2021
2071	Claremont Lane	Tilford Lane	Essex Blvd	2071	261.2	1514.96	Collector	Rural	Residential	5.8	Hot Mix Asphalt	200	2016	65	2021	8.5	2021	3.42	2021
2072	McLeod Avenue	Erie Avenue	Warren Mickie Park	2072	308.3	1418.18	Collector	Urban	Residential	4.6	Hot Mix Asphalt	300	2016	52	2021	7.3	2021	3.69	2021
2073	McLeod Avenue	Warren Mickle Park	Change in Pavement (MN # 438)	2073	1588.3	8100.33	Collector	Semi-Urban	Residential	5.1	Gravel	325	2016	50	2021		2021		2021
2074	McLeod Avenue	Change in Pavement (MN # 438)	Concession 3 South	2074	619.5	3531.15	Collector	Semi-Urban	Residential	5.7	Hot Mix Asphalt	325	2016	39	2021	5.7	2021	3.51	2021
2075	Ridgewood Lane	Mcleod Avenue	Lakewood Drive	2075	283.8	1702.8	Local	Urban	Residential	6	Hot Mix Asphalt	350	2016	64	2021	8.5	2021	3.54	2021
2076	Point Boulevard	McLeod Avenue	Culdasac	2076	527.9	2903.45	Local	Semi-Urban	Residential	5.5	Surface Treated	200	2016	86	2021	9.8	2021	2.75	2021
2077	Front Road South	Essex County Road 20	Erie Avenue	2077	1110.1	7437.67	Collector	Urban	Residential	6.7	Hot Mix Asphalt	850	2016	50	2021	6.8	2021	3.30	2021
2078	Malden Colchester South Townline	County Rd 50	Beach	2078	557.5	3623.75	Local	Rural	Residential	6.5	Surface Treated	150	2016	91	2021	9.9	2021	1.98	2021
2079	Shaw Dr	County Rd 20 (West)	County Rd 20 (East)	2079	386.7	3093.6	Local	Urban	Residential	8	Hot Mix Asphalt	150	2016	98	2021	10	2021	3.64	2021
2080	Smith Road	South Sideroad - Malden	Malden Colchester South	2080	2196.6	8237.25	Local	Rural	Residential	3.75	Surface Treated	900	2016	4	2021	3.6	2021		2021
2081	McBride Road	McLeod Avenue	Willow Beach Road	2081	424.1	3392.8	Local	Urban	Residential	8	Hot Mix Asphalt	150	2016	70	2021	9.3	2021	3.61	2021
2082	Lake Erie Drive	Tilford Lane	Woodland Lane	2082	206.6	1033	Local	Semi-Urban	Residential	5	Hot Mix Asphalt	200	2016	87	2021	9.3	2021	6.95	2021
2083	Adams Avenue	Shaw Dr	Culdasac	2083	57.4	459.2	Local	Urban	Residential	8	Hot Mix Asphalt	100	2016	98	2021	10	2021	5.92	2021
2085	McLeod Avenue	3rd Concession South	Lakewood Dr	2085	1243.4	7087.38	Collector	Semi-Urban	Residential	5.7	Hot Mix Asphalt	300	2016	45	2021	6.3	2021	3.45	2021
2086	Tilford Lane	Ridgewood Lane	Essex Blvd	2086	162.4	812	Local	Semi-Urban	Residential	5	Hot Mix Asphalt	250	2016	66	2021	9.1	2021	4.02	2021
2087	Claremont Lane	Essex Blvd	Ridgewood Lane	2087	167	835	Local	Semi-Urban	Residential	5	Hot Mix Asphalt	300	2016	60	2021	8.5	2021	4.10	2021
3001	Concession 3 North	Malden Road (Essex Road 8)	North Sideroad	3001	2380.5	14283	Local	Rural	Residential	6	Hot Mix Asphalt	2200	2016	81	2021	8.7	2021	1.40	2021
3002	Concession 4 North	North Sideroad	Essex Road 8	3002	2410.6	16874.2	Local	Rural	Residential	7	Hot Mix Asphalt	600	2016	57	2021	6.9	2021	2.46	2021
3003	Concession 5 North	Essex County Road 8	North Sideroad	3003	2377.8	14504.58	Local	Rural	Residential	6.1	Hot Mix Asphalt	1300	2016	38	2021	5.4	2021	3.27	2021
3004	Concession 6 North	North Sideroad	Essex County Road 8	3004	2374.2	14482.62	Local	Rural	Residential	6.1	Hot Mix Asphalt	1300	2016	79	2021	9	2021	2.10	2021
3005	Concession 8	Essex County Road 8	North Sideroad	3005	2363.4	15598.44	Local	Rural	Residential	6.6	Hot Mix Asphalt	1100	2016	43	2021	5.8	2021	3.12	2021
3006	Concession 2 North	North Sideroad	South Riverview Drive	3006	1527.8	10389.04	Local	Rural	Residential	6.8	Hot Mix Asphalt	1888	2016	79	2021	7.2	2021	0.00	2021
3007	Concession 2 North	Middle Sideroad - Anderdon (County North Sideroad	North Sideroad	3007	2440.2	16593.36	Local	Rural	Residential	6.8	Hot Mix Asphalt	2000	2016	34	2021	5	2021	3.32	2021
3008	Concession 3 North	North Sideroad	Middle Sideroad - Anderdon (Essex C	3008	2444.2	15642.88	Local	Rural	Residential	6.4	Hot Mix Asphalt	2200	2016	73	2021	8.2	2021	1.98	2021
3009	Concession 4 North	Middle Sideroad- Anderdon (Essex C	North Sideroad	3009	2439.6	17077.2	Local	Rural	Residential	7	Hot Mix Asphalt	600	2016	55	2021	6.7	2021	2.50	2021
3010	Concession 5 North	North Sideroad	Middle Sideroad - Anderdon (Essex C	3010	2444.2	16620.56	Local	Rural	Residential	6.8	Hot Mix Asphalt	1400	2016	67	2021	7.8	2021	2.25	2021
3011	Concession 6 North	Middle Sideroad - Anderdon (Essex C	North Sideroad	3011	2446.6	15168.92	Local	Rural	Residential	6.2	Hot Mix Asphalt	1300	2016	73	2021	8.5	2021	2.34	2021
3012	Concession 8	North Sideroad	Middle Sideroad - Anderdon (Essex C	3012	2453	16189.8	Local	Rural	Residential	6.6	Hot Mix Asphalt	1100	2016	33	2021	4.8	2021	3.25	2021
3013	Concession 3 North	Middle Sideroad - Anderdon (Essex C	Texas Road	3013	1835.7	11748.48	Local	Rural	Residential	6.4	Hot Mix Asphalt	2000	2016	39	2021	5.7	2021	3.53	2021
3014	Concession 4 North	Texas Road	Middle Sideroad - Anderdon (Essex C	3014	1840.3	12330.01	Local	Rural	Residential	6.7	Hot Mix Asphalt	700	2016	86	2021	9.7	2021	1.95	2021
3015	Concession 6 South	Middle Sideroad - Anderdon (Essex C	Texas Road	3015	1839.6	11773.44	Local	Rural	Residential	6.4	Hot Mix Asphalt	1300	2016	84	2021	10	2021	2.65	2021
3016	Concession 6 North	Texas Road	Middle Sideroad - Anderdon (Essex C	3016	1843.2	11612.16	Local	Rural	Residential	6.3	Hot Mix Asphalt	1000	2016	64	2021	8.5	2021	3.50	2021
3017	Concession 8	Texas Road	Middle Sideroad - Anderdon (Essex C	3017	1844.3	11987.95	Local	Rural	Residential	6.5	Hot Mix Asphalt	900	2016	40	2021	6.1	2021	3.79	2021
3018	Concession 3 North	Texas Road	Alma Street	3018	1842.6	11424.12	Local	Rural	Residential	6.2	Hot Mix Asphalt	1700	2016	51	2021	6.7	2021	3.13	2021
3019	Concession 4 North	Alma Street	Texas Road	3019	1837.6	12311.92	Local	Rural	Residential	6.7	Hot Mix Asphalt	650	2016	89	2021	10	2021	1.94	2021
3020	Concession 5 North	Texas Road	Alma Street	3020	1839.3	12507.24	Local	Rural	Residential	6.8	Hot Mix Asphalt	880	2016	87	2021	10	2021	2.21	2021
3021	Concession 6 North	Alma Street	Texas Road	3021	1834.3	11005.8	Local	Rural	Residential	6	Hot Mix Asphalt	1000	2016	48	2021	6.3	2021	2.90	2021
3022	Concession 8	Alma Street	Texas Road	3022	1832.4	11727.36	Local	Rural	Residential	6.4	Hot Mix Asphalt	750	2016	36	2021	4.8	2021	2.82	2021
3023	North Sideroad	Concession 2 North	Concession 3 North	3023	1380.5	9249.35	Local	Rural	Residential	6.7	Hot Mix Asphalt	400	2016	51	2021	6.4	2021	2.77	2021
3024	North Sideroad	Concession 3 North	Concession 4 North	3024	1364.7	6141.15	Local	Rural	Residential	4.5	Gravel	80	2016	85	2021		2021		2021
3025	North Sideroad	200m west of Concession 4	Concession 5 North	3025	1176.6	6471.3	Local	Rural	Residential	5.5	Gravel	30	2016	85	2021		2021		2021
3025a	North Sideroad	Concession 4 North	200m west of Concession 4	3025a	200	1100	Local	Rural	Residential	5.5	Hot Mix Asphalt			69	2021	18	2021		2021
3026	North Sideroad	Concession 5 North	Concession 6 North	3026	1376.3	7569.65	Local	Rural	Residential	5.5	Gravel	100	2016	80	2021		2021		2021
3028	North Sideroad	Essex County Road 9 (Howard Avenue	Concession 8	3028	1377	7573.5	Local	Rural	Residential	5.5	Gravel	200	2016	75	2021		2021		2021
3029	North Sideroad	Concession 8	Essex County Road 11 (Walker Road)	3029	1369.6	7532.8	Local	Rural	Residential	5.5	Gravel	150	2016	75	2021		2021	1.97	2021
3030	Texas Road	Thomas Road (Essex County Road 5)	Concession 3 North (Fox Road)	3030	1369.4	9038.04	Local	Rural	Residential	6.6	Hot Mix Asphalt	600	2016	89	2021	31	2021		2021
3031	Texas Road	Concession 3 North (Fox Road)	Concession 4 North	3031	1375.3	7564.15	Local	Rural	Residential	5.5	Gravel	120	2016	65	2021		2021		2021
3032	Texas Road	Concession 4 North	Concession 5 North	3032	1381	7595.5	Local	Rural	Residential	5.5	Gravel	80	2016	60	2021		2021		2021
3033	Texas Road	Concession 5 North	Concession 6 North	3033	1372.7	7549.85	Local	Rural	Residential	5.5	Gravel	50	2016	70	2021		2021		2021
3034	Texas Road	Concession 6 North	Essex County Road 9 (Howard Avenue	3034	1366.9	7517.95	Local	Rural	Residential	5.5	Gravel	80	2016	65	2021		2021		2021
3035	Texas Road	Essex County Road 9 (Howard Avenue	Concession 8	3035	1379.9	7589.45	Local	Rural	Residential	5.5	Gravel	80	2016	75	2021		2021		2021
3036	Texas Road	Concession 8	Closure of Road - Dead End	3036	624.9	3436.95	Local	Rural	Residential	5.5	Gravel	50	2016	65	2021		2021	2.97	2021
3037	Texas Road	Essex County Road 11 (Walker Road)	Closure of Road (Dead End)	3037	303.8	1670.9	Local	Rural	Residential	5.5	Surface Treated	50	2016	62	2021	7.5	2021	2.72	2021
3039	Alma Street	Concession 4 South	Thomas Road (Essex County Road 5)	3039	1853.8	12976.6	Local	Rural	Residential	7	Hot Mix Asphalt	4700	2016						

APPENDIX D

Amherstburg Road Network Overview



Infrastructure Solutions

August 19, 2021

Town of Amherstburg



The Town of
Amherstburg
ONTARIO

Report Type: Network Overview
Report Generated by: Hans Hens

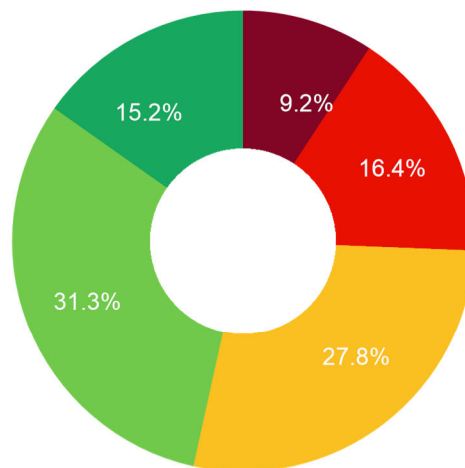
Network Overview

The Town of Amherstburg has a total of 233 Km of Roads. The network overall condition based on the latest condition assessment data is estimated at 60, representing an overall "Fair" condition. The details of network overview information are as follows.

Title	Condition	Condition State
Network Overall Condition	60	Fair
Network Condition 2016	56	Fair

Network Condition Status

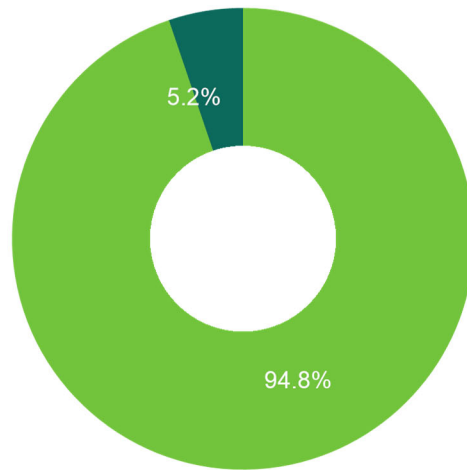
■ Very Poor
 ■ Poor
 ■ Fair
 ■ Good
 ■ Excellent



Condition	Length	Percentage
Very Poor	21.5	9.2%
Poor	38.2	16.4%
Fair	64.8	27.8%
Good	72.8	31.3%
Excellent	35.5	15.2%

Functional Class Breakdown

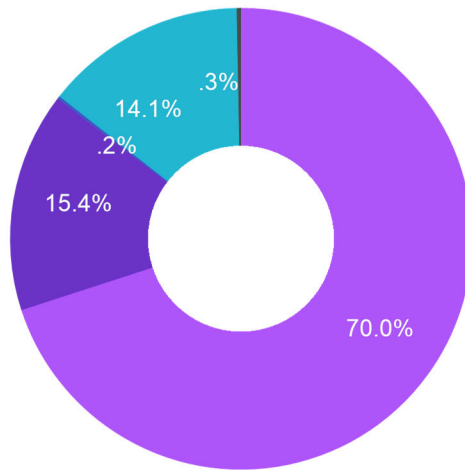
Local Collector



Functional Class	Length	Percentage
Local	220.8	94.8%
Collector	12.0	5.2%

Surface Type Breakdown

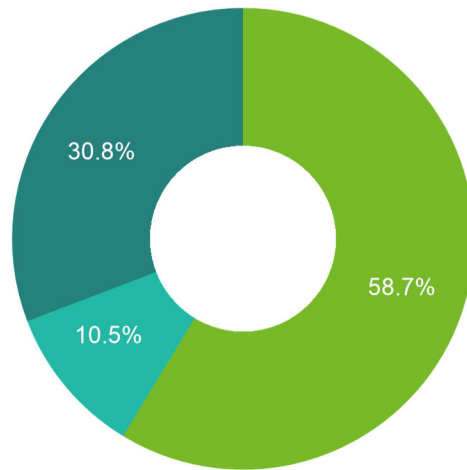
■ Hot Mix Asphalt
 ■ Surface Treated
 ■ Concrete
 ■ Gravel
 ■ Paver Interlock



Surface Type	Length	Percentage
Hot Mix Asphalt	163.0	70.0%
Surface Treated	35.9	15.4%
Concrete	0.4	0.2%
Gravel	32.8	14.1%
Paver Interlock	0.6	0.3%

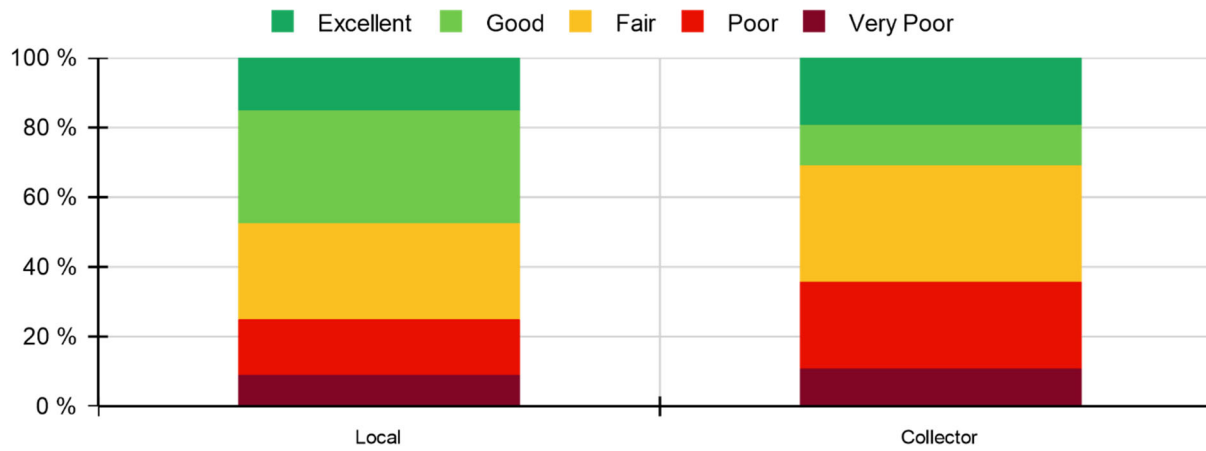
Roadside Environment Breakdown

■ Rural
 ■ Semi-Urban
 ■ Urban



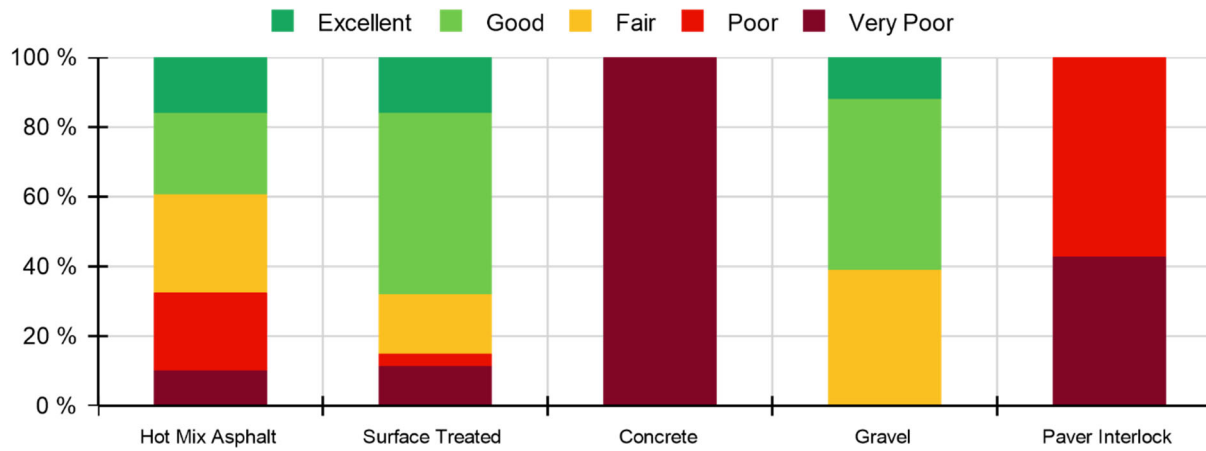
Roadside Environment	Length	Percentage
Rural	136.7	58.7%
Semi-Urban	24.4	10.5%
Urban	71.7	30.8%

Condition Status by Functional Class



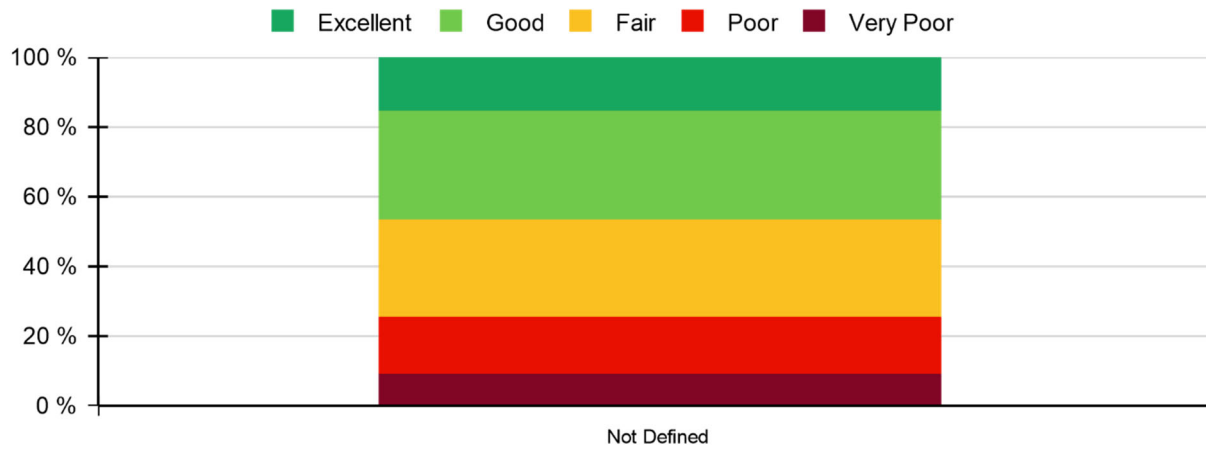
Functional Class	Excellent	Good	Fair	Poor	Very Poor
Local	33.2	31.5	27.8	16.5	10.8
Collector	20.1	11.5	33.8	25.5	9.1

Condition Status by Surface Type



Surface Type	Excellent	Good	Fair	Poor	Very Poor
Hot Mix Asphalt	25.9	38.0	45.9	36.5	16.6
Surface Treated	5.7	18.7	6.1	1.3	4.1
Concrete	0.0	0.0	0.0	0.0	0.4
Gravel	3.9	16.1	12.8	0.0	0.0
Paver Interlock	0.0	0.0	0.0	0.4	0.3

Condition Status by MMS



Minimum Maintenance	Excellent	Good	Fair	Poor	Very Poor
Not Defined	35.5	72.8	64.8	38.2	21.5

APPENDIX E

Scenario 1 - Optimization with Fixed Annual Budget of \$4 Million



LEGEND

ROAD SEGMENT

2026 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 2 4
1:75,000 KILOMETRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

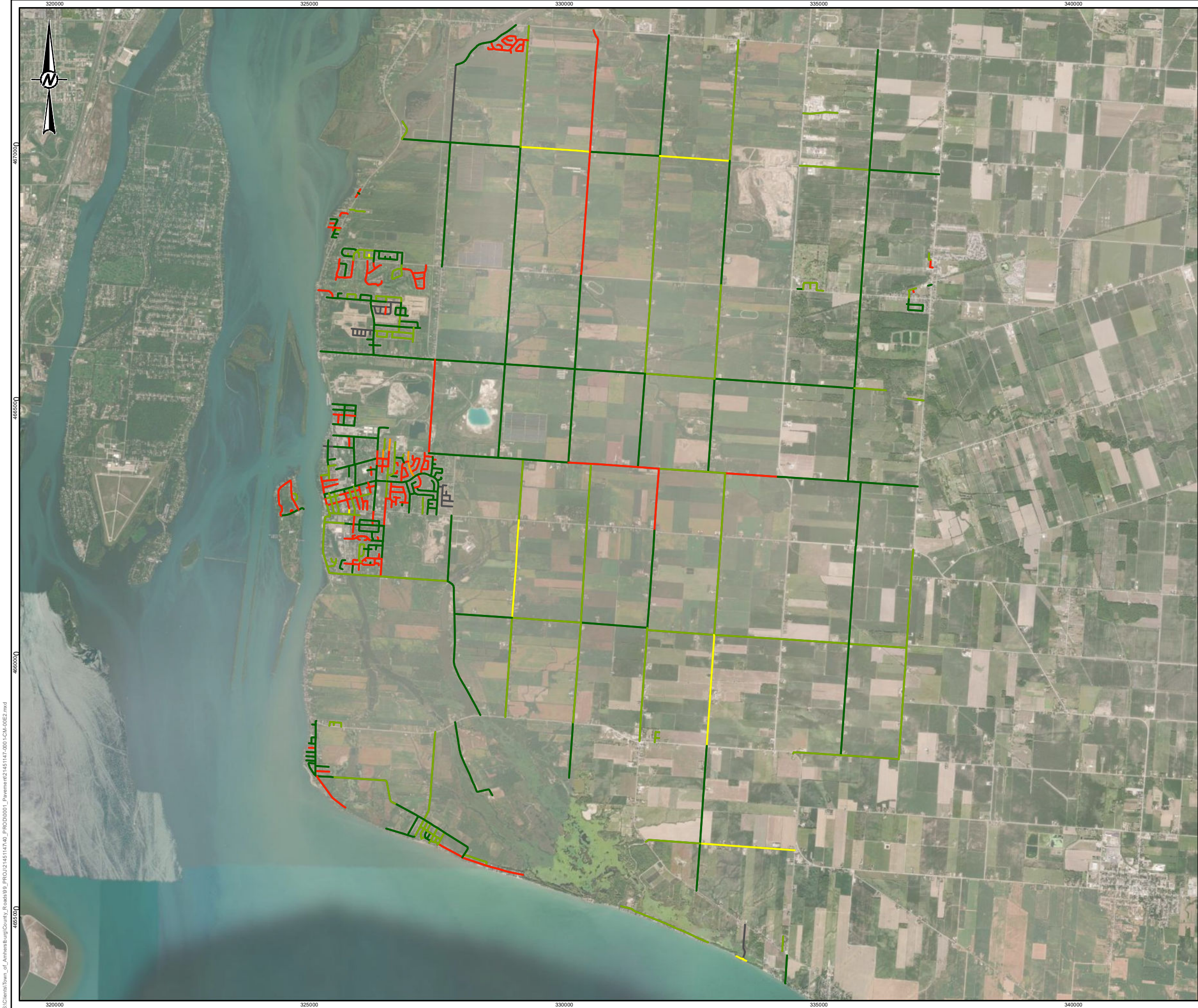
2021 ROADS NEEDS STUDY

TITLE

2026 SCENARIO ONE ROAD CONDITIONS

CONSULTANT	YYYY-MM-DD	2021-10-25
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	E1



LEGEND

ROAD SEGMENT

2031 CONDITION RATING

- EXCELLENT
- GOOD
- FAIR
- POOR
- VERY POOR

0 2 4
1:75,000 KILOMETRES

REFERENCE(S)

1. BASEDATA MNRF 2016
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

THE CORPORATION OF THE TOWN OF AMHERSTBURG

PROJECT

2021 ROADS NEEDS STUDY

TITLE

2031 SCENARIO ONE ROAD CONDITIONS

CONSULTANT	YYYY-MM-DD	2021-10-21
 GOLDER MEMBER OF WSP	DESIGNED	MM
	PREPARED	MM
	REVIEWED	MSM
	APPROVED	MPN

PROJECT NO.	CONTROL	REV.	FIGURE
21451147	0001	A	E2

Optimization Result

Scenario Summary

Scenario	
Name:	RNS(3) Sc 1 - Optimization
Description:	Cap Budget \$3.85 mil/yr, Routine Maint. \$150k/yr, Revised Treatment List & OEA
Year:	2022

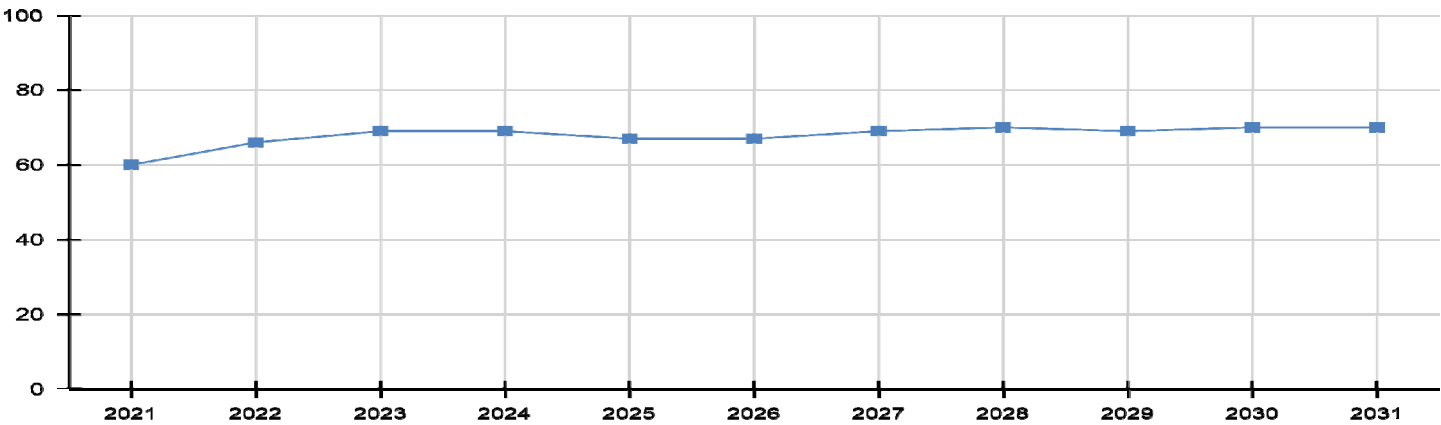
Optimization Settings

Optimization Mode	Standard
Planning Horizon (Years)	10
Include Priorities	Yes
Operational Efficiency	Yes
Estimate Current Condition	False

Optimization Objective

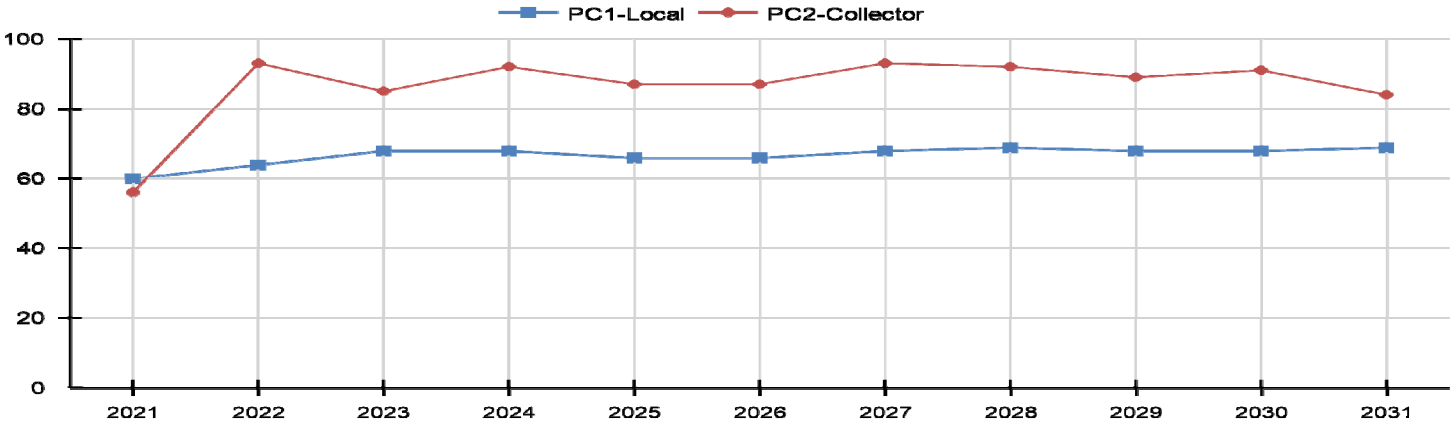
Type	Min/Max	Weight (Sum = 1)	Performance Attribute
Maximize Network Condition	Max	1	NA

Network Condition



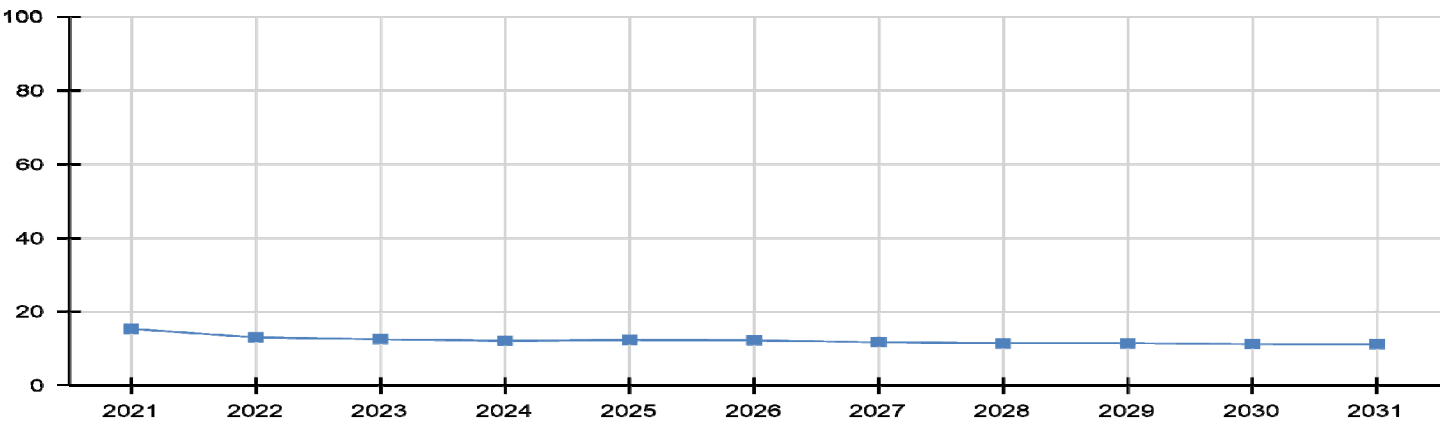
Year	Condition
2021	60
2022	66
2023	69
2024	69
2025	67
2026	67
2027	69
2028	70
2029	69
2030	70
2031	70

Network Condition by Performance Class



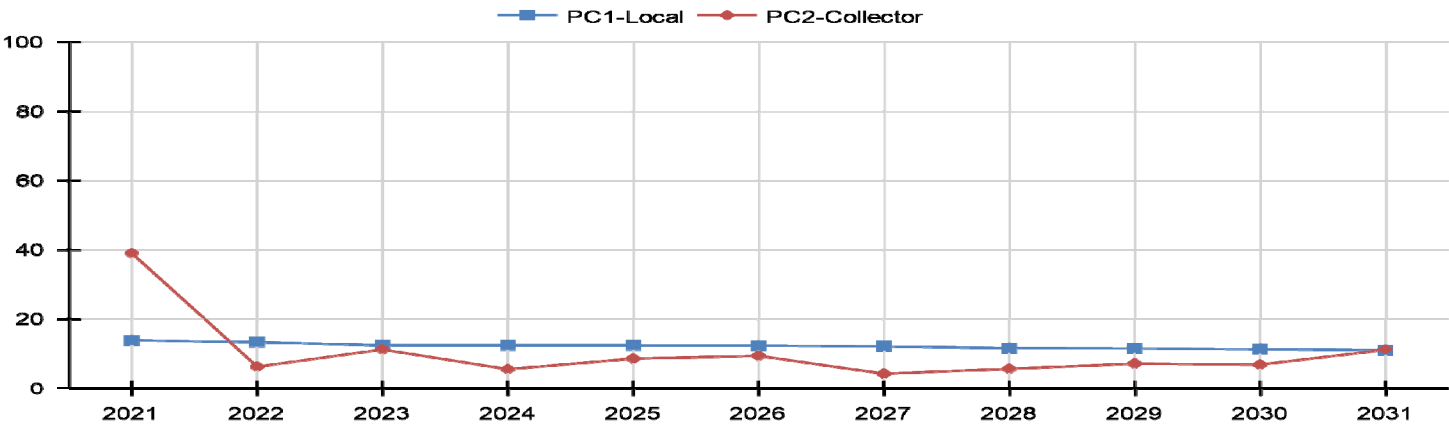
Year	PC1-Local	PC2-Collector
2021	60	56
2022	64	93
2023	68	85
2024	68	92
2025	66	87
2026	66	87
2027	68	93
2028	69	92
2029	68	89
2030	68	91
2031	69	84

Network Risk Index



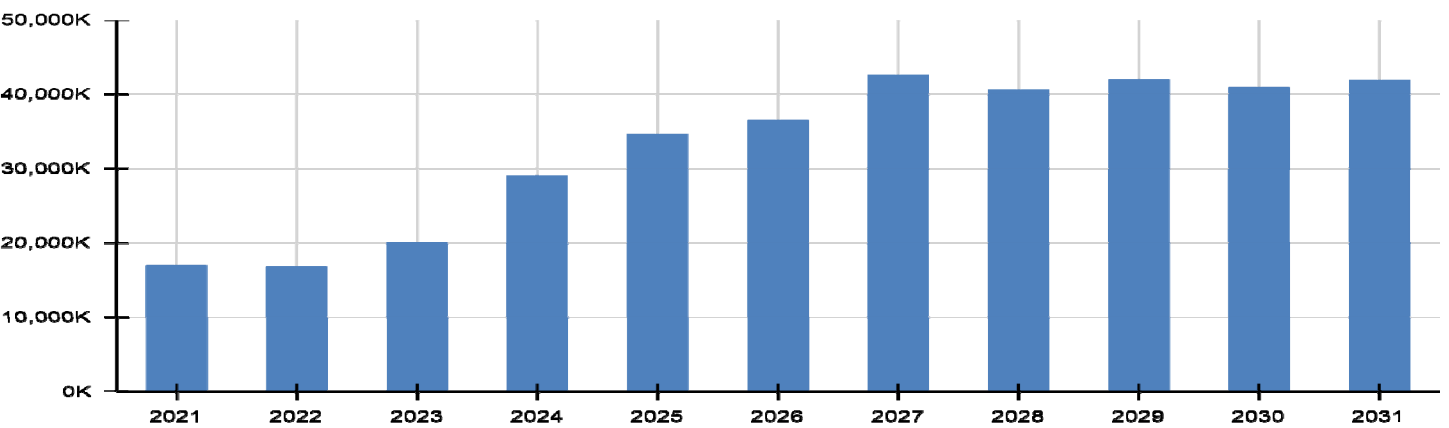
Year	Value
2021	15
2022	13
2023	12
2024	12
2025	12
2026	12
2027	12
2028	11
2029	11
2030	11
2031	11

Network Risk Index by Performance Class



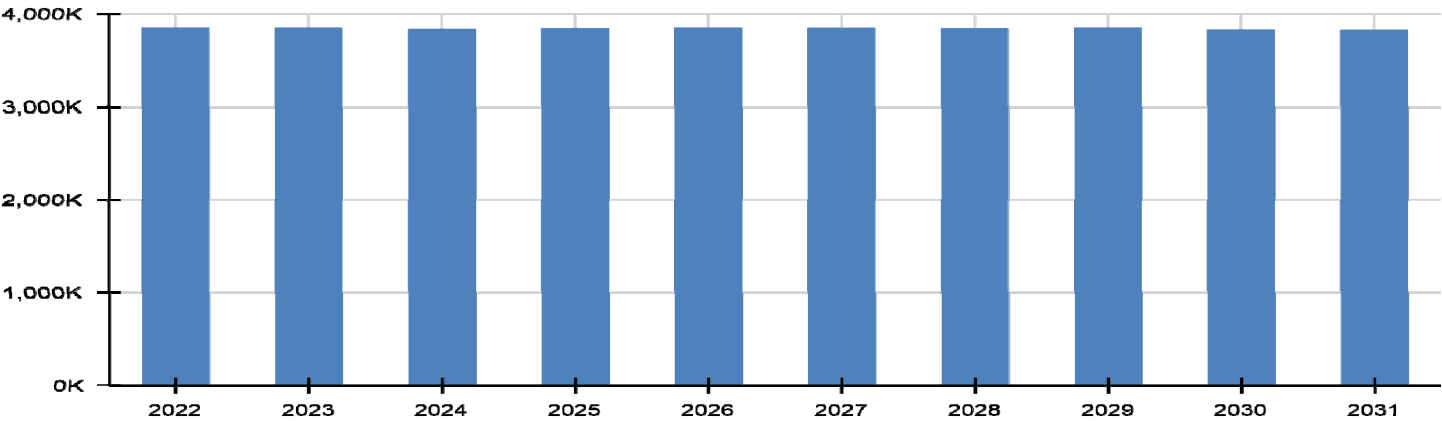
Year	PC1-Local	PC2-Collector
2021	14	39
2022	13	6
2023	13	11
2024	13	6
2025	13	9
2026	12	10
2027	12	4
2028	12	6
2029	12	7
2030	11	7
2031	11	11

Deficit Projection



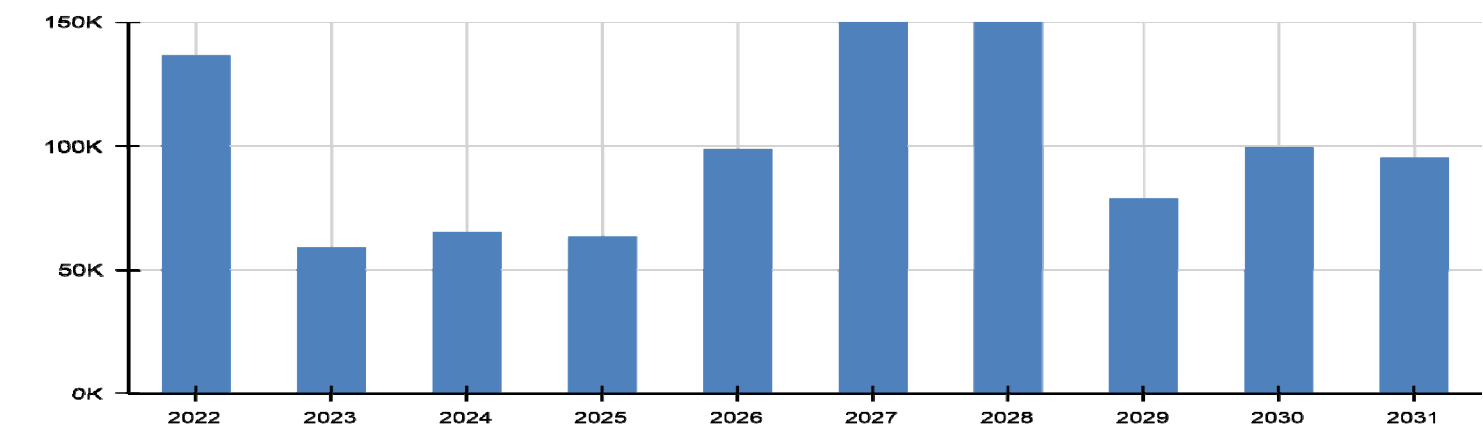
Year	Value
2021	\$16,924,956
2022	\$16,782,406
2023	\$20,070,903
2024	\$29,048,489
2025	\$34,597,885
2026	\$36,465,184
2027	\$42,585,777
2028	\$40,579,695
2029	\$42,012,142
2030	\$40,901,522
2031	\$41,936,954

Capital Expenditure



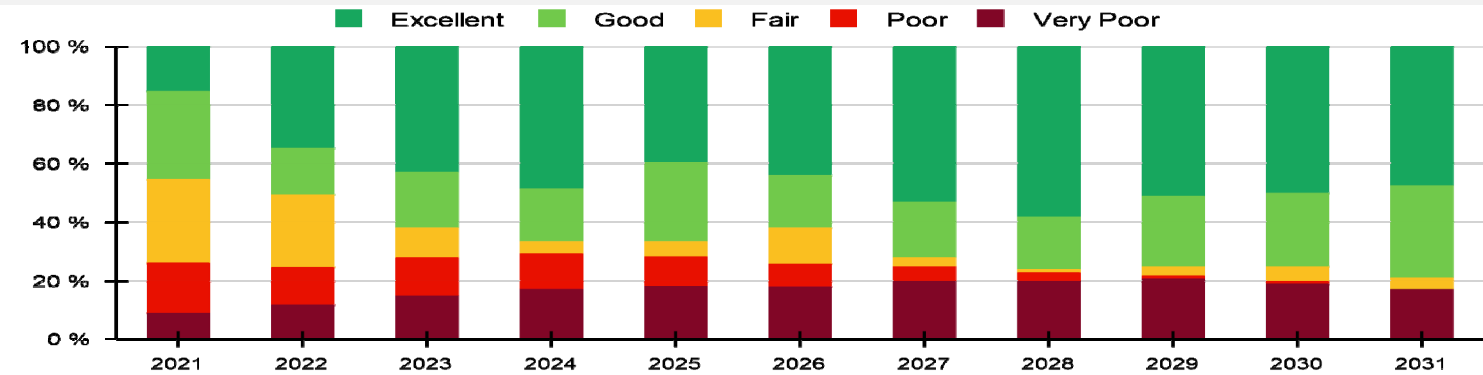
Year	Value
2022	\$3,848,828
2023	\$3,848,667
2024	\$3,831,697
2025	\$3,844,627
2026	\$3,849,357
2027	\$3,846,104
2028	\$3,836,931
2029	\$3,849,299
2030	\$3,828,617
2031	\$3,824,455

Maintenance Expenditure



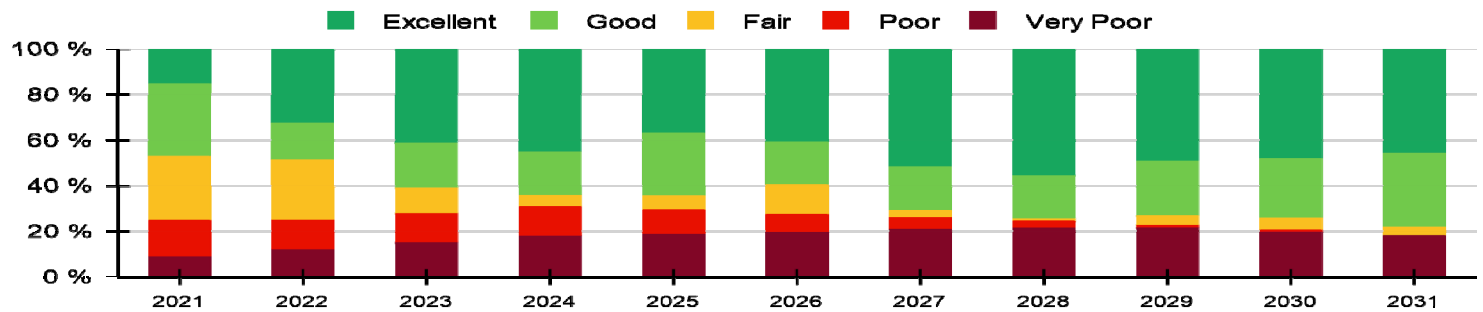
Year	Value
2022	\$136,427
2023	\$59,104
2024	\$65,115
2025	\$63,449
2026	\$98,716
2027	\$149,949
2028	\$149,984
2029	\$78,732
2030	\$99,494
2031	\$95,339

Network Condition Distribution



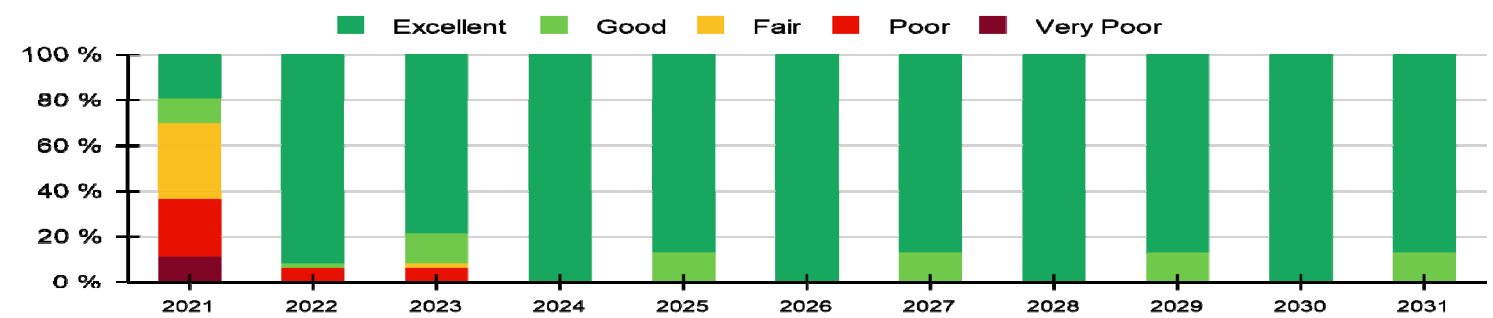
Year	Excellent	Good	Fair	Poor	Very Poor
2021	15%	30%	28%	17%	9%
2022	35%	16%	25%	13%	12%
2023	43%	19%	10%	13%	15%
2024	48%	18%	4%	12%	17%
2025	39%	27%	5%	10%	18%
2026	44%	18%	12%	8%	18%
2027	53%	19%	3%	5%	20%
2028	58%	18%	1%	3%	20%
2029	51%	24%	3%	1%	21%
2030	50%	25%	5%	1%	19%
2031	47%	31%	4%	0%	17%

PC1-Local Condition Distribution



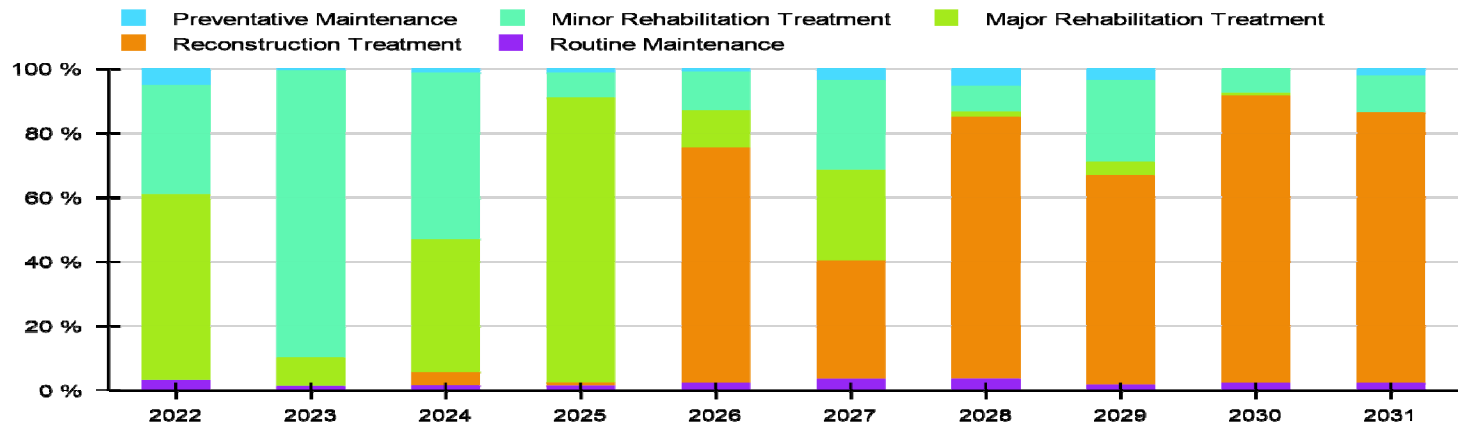
Year	Excellent	Good	Fair	Poor	Very Poor
2021	15%	32%	28%	16%	9%
2022	32%	16%	26%	13%	12%
2023	41%	20%	11%	13%	15%
2024	45%	19%	5%	13%	18%
2025	37%	28%	6%	11%	19%
2026	41%	19%	13%	8%	20%
2027	51%	19%	3%	5%	21%
2028	56%	19%	1%	3%	22%
2029	49%	24%	4%	1%	22%
2030	48%	26%	5%	1%	20%
2031	45%	32%	4%	0%	18%

PC2-Collector Condition Distribution



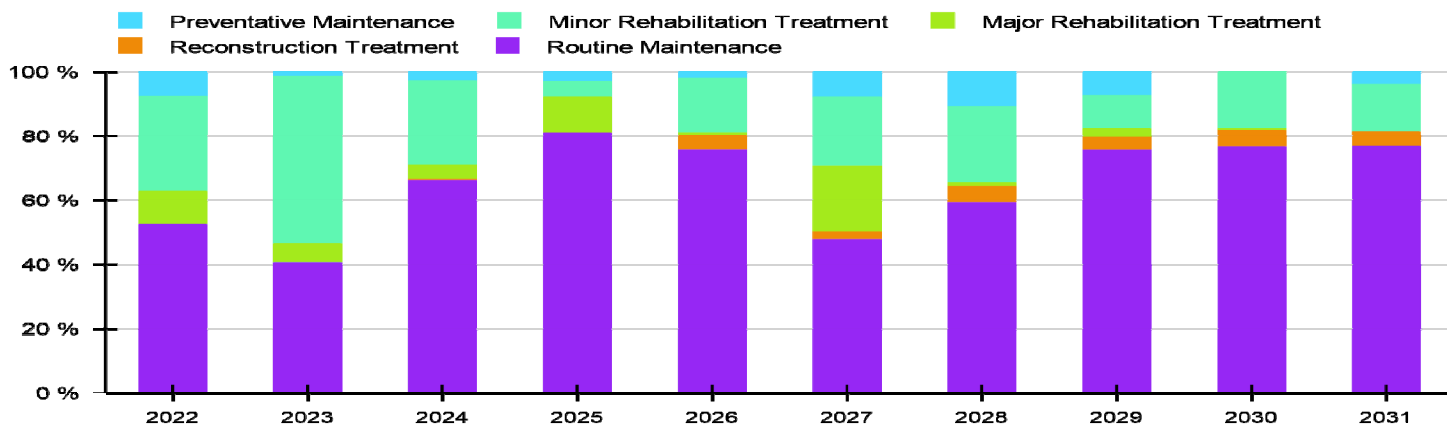
Year	Excellent	Good	Fair	Poor	Very Poor
2021	19%	11%	33%	25%	11%
2022	91%	2%	0%	6%	0%
2023	78%	13%	2%	6%	0%
2024	100%	0%	0%	0%	0%
2025	87%	13%	0%	0%	0%
2026	100%	0%	0%	0%	0%
2027	87%	13%	0%	0%	0%
2028	100%	0%	0%	0%	0%
2029	87%	13%	0%	0%	0%
2030	100%	0%	0%	0%	0%
2031	87%	13%	0%	0%	0%

Capital Expenditure by Treatment Type



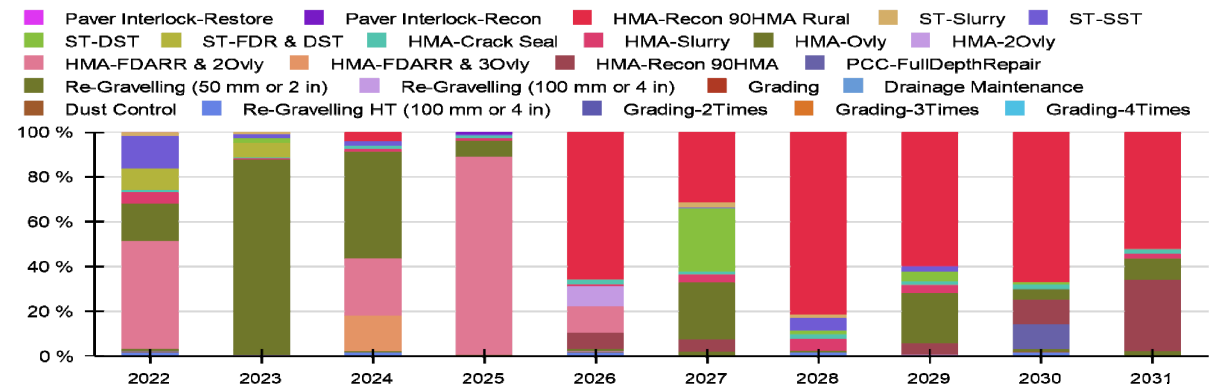
Year	Preventative Maintenance	Minor Rehabilitation Treatment	Major Rehabilitation Treatment	Reconstruction Treatment	Routine Maintenance	Total
2022	\$199,295	\$1,347,905	\$2,301,628	\$0	\$136,427	\$3,985,255
2023	\$22,829	\$3,487,122	\$338,716	\$0	\$59,104	\$3,907,771
2024	\$45,620	\$2,013,963	\$1,611,662	\$160,452	\$65,115	\$3,896,812
2025	\$44,991	\$305,623	\$3,452,463	\$41,550	\$63,449	\$3,908,076
2026	\$37,086	\$469,646	\$461,588	\$2,881,037	\$98,716	\$3,948,073
2027	\$145,849	\$1,102,924	\$1,125,562	\$1,471,769	\$149,949	\$3,996,053
2028	\$213,782	\$312,405	\$65,211	\$3,245,533	\$149,984	\$3,986,915
2029	\$143,704	\$987,038	\$168,465	\$2,550,092	\$78,732	\$3,928,031
2030	\$0	\$289,752	\$36,238	\$3,502,627	\$99,494	\$3,928,111
2031	\$82,759	\$443,865	\$0	\$3,297,831	\$95,339	\$3,919,794
Total	\$935,915	\$10,760,243	\$9,561,533	\$17,150,891	\$996,309	\$39,404,891

Project Size by Treatment Type (Km)



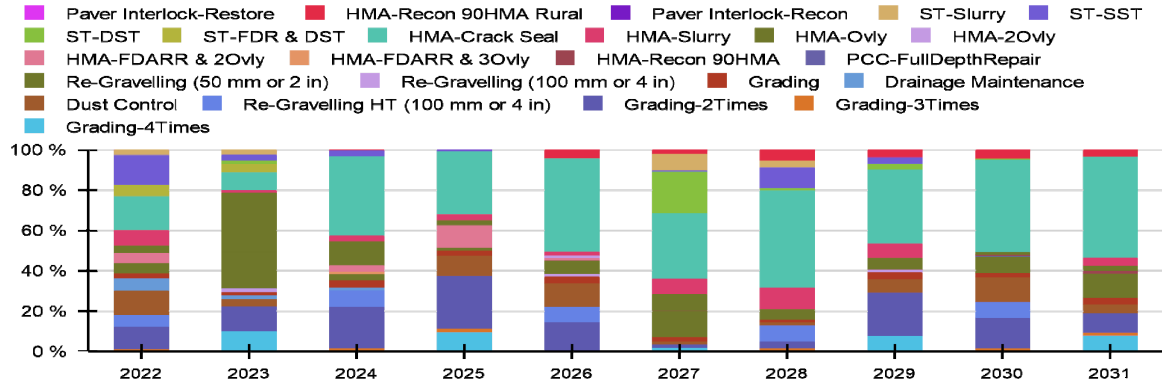
Year	Preventative Maintenance	Minor Rehabilitation Treatment	Major Rehabilitation Treatment	Reconstruction Treatment	Routine Maintenance	Total
2022	9.77	37.95	13.60	0.00	67.58	128.90
2023	0.95	39.06	4.44	0.00	30.44	74.89
2024	2.37	23.34	3.85	0.40	58.81	88.77
2025	2.38	3.73	8.74	0.03	64.17	79.04
2026	1.84	16.65	1.05	4.42	74.76	98.72
2027	6.98	19.39	18.53	2.15	42.97	90.01
2028	9.79	21.64	1.01	4.89	54.04	91.37
2029	7.01	10.08	2.75	3.83	73.58	97.24
2030	0.00	16.45	0.56	5.09	72.47	94.56
2031	3.70	14.03	0.00	4.57	73.58	95.88
Total	44.79	202.31	54.53	25.37	612.38	939.38

Capital Expenditure by Treatment Method



Treatment	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
HMA-Recon 90HMA Rural	\$0	\$0	\$160,452	\$0	\$2,596,962	\$1,251,065	\$3,245,533	\$2,349,907	\$2,633,820	\$2,046,674	\$14,284,413
Paver Interlock-Recon	\$0	\$0	\$0	\$41,550	\$0	\$0	\$0	\$0	\$0	\$0	\$41,550
Paver Interlock-Restore	\$2,100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,100
ST-Slurry	\$66,919	\$37,384	\$0	\$0	\$0	\$94,066	\$62,224	\$0	\$0	\$0	\$260,593
ST-SST	\$577,298	\$71,563	\$75,878	\$18,119	\$0	\$14,517	\$220,874	\$98,768	\$0	\$0	\$1,077,017
ST-DST	\$0	\$81,920	\$0	\$0	\$0	\$1,125,562	\$65,211	\$168,465	\$36,238	\$0	\$1,477,396
ST-FDR & DST	\$388,210	\$256,796	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$645,006
HMA-Crack Seal	\$37,916	\$11,385	\$58,492	\$46,258	\$83,343	\$53,172	\$85,044	\$63,273	\$83,767	\$84,543	\$607,193
HMA-Slurry	\$199,295	\$22,829	\$45,620	\$44,991	\$37,086	\$145,849	\$213,782	\$143,704	\$0	\$82,759	\$935,915
HMA-Ovly	\$667,783	\$3,317,502	\$1,859,338	\$279,974	\$0	\$1,014,426	\$0	\$876,978	\$179,398	\$369,884	\$8,565,283
HMA-2Ovly	\$0	\$0	\$0	\$0	\$355,531	\$0	\$0	\$0	\$0	\$0	\$355,531
HMA-FDARR & 2Ovly	\$1,913,418	\$0	\$990,983	\$3,452,463	\$461,588	\$0	\$0	\$0	\$0	\$0	\$6,818,452
HMA-FDARR & 3Ovly	\$0	\$0	\$620,679	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$620,679
HMA-Recon 90HMA	\$0	\$0	\$0	\$0	\$284,075	\$220,704	\$0	\$200,185	\$439,394	\$1,251,158	\$2,395,516
PCC-FullDepthRepair	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$429,413	\$0	\$429,413
Re-Gravelling (50 mm or 2 in)	\$41,619	\$86,765	\$17,542	\$7,530	\$41,619	\$73,981	\$30,327	\$0	\$49,149	\$73,981	\$422,513
Re-Gravelling (100 mm or 4 in)	\$0	\$11,291	\$0	\$0	\$11,291	\$0	\$0	\$11,291	\$0	\$0	\$33,873
Grading	\$381	\$141	\$381	\$240	\$381	\$240	\$141	\$381	\$240	\$381	\$2,907
Drainage Maintenance	\$9,506	\$1,652	\$1,412	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,570
Dust Control	\$15,678	\$2,741	\$0	\$7,880	\$11,560	\$1,365	\$1,377	\$6,503	\$11,560	\$4,118	\$62,782
Re-Gravelling HT (100 mm or 4 in)	\$61,204	\$0	\$61,204	\$0	\$61,204	\$0	\$61,204	\$0	\$61,204	\$0	\$306,020
Grading-2Times	\$3,432	\$2,219	\$4,335	\$4,993	\$3,432	\$344	\$702	\$4,993	\$3,432	\$2,219	\$30,101
Grading-3Times	\$496	\$0	\$496	\$496	\$0	\$0	\$496	\$0	\$496	\$496	\$2,976
Grading-4Times	\$0	\$3,583	\$0	\$3,583	\$0	\$762	\$0	\$3,583	\$0	\$3,583	\$15,094
Total	\$3,985,255	\$3,907,771	\$3,896,812	\$3,908,077	\$3,948,072	\$3,996,053	\$3,986,915	\$3,928,031	\$3,928,111	\$3,919,796	\$39,404,893

Project Size by Treatment Method (Km)



Treatment	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
HMA-Recon 90HMA Rural	0.00	0.00	0.40	0.00	4.21	1.92	4.89	3.68	4.20	3.22	22.51
Paver Interlock-Recon	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Paver Interlock-Restore	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
ST-Slurry	3.27	1.87	0.00	0.00	0.00	7.30	3.13	0.00	0.00	0.00	15.57
ST-SST	19.06	2.14	2.45	0.56	0.00	0.53	9.44	3.13	0.00	0.00	37.29
ST-DST	0.00	1.31	0.00	0.00	0.00	18.53	1.01	2.75	0.56	0.00	24.16
ST-FDR & DST	7.30	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.43
HMA-Crack Seal	21.83	6.57	35.02	24.64	45.72	29.29	44.06	35.63	43.23	48.21	334.19
HMA-Slurry	9.77	0.95	2.37	2.38	1.84	6.98	9.79	7.01	0.00	3.70	44.79
HMA-Ovly	4.93	21.99	10.69	1.99	0.00	7.30	0.00	5.58	1.31	2.47	56.24
HMA-2Ovly	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	1.31
HMA-FDARR & 2Ovly	6.30	0.00	2.80	8.74	1.05	0.00	0.00	0.00	0.00	0.00	18.90
HMA-FDARR & 3Ovly	0.00	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
HMA-Recon 90HMA	0.00	0.00	0.00	0.00	0.21	0.23	0.00	0.15	0.48	1.35	2.42
PCC-FullDepthRepair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.41
Re-Gravelling (50 mm or 2 in)	6.50	13.56	2.74	1.18	6.50	11.56	4.74	0.00	7.68	11.56	66.02
Re-Gravelling (100 mm or 4 in)	0.00	1.38	0.00	0.00	1.38	0.00	0.00	1.38	0.00	0.00	4.13
Grading	3.17	1.18	3.17	2.00	3.17	2.00	1.18	3.17	2.00	3.17	24.22
Drainage Maintenance	7.92	1.38	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.48
Dust Control	15.68	2.74	0.00	7.88	11.56	1.37	1.38	6.50	11.56	4.12	62.78
Re-Gravelling HT (100 mm or 4 in)	7.46	0.00	7.46	0.00	7.46	0.00	7.46	0.00	7.46	0.00	37.32
Grading-2Times	14.30	9.24	18.06	20.80	14.30	1.43	2.93	20.80	14.30	9.24	125.42
Grading-3Times	1.38	0.00	1.38	1.38	0.00	0.00	1.38	0.00	1.38	1.38	8.26
Grading-4Times	0.00	7.46	0.00	7.46	0.00	1.59	0.00	7.46	0.00	7.46	31.44
Total	128.90	74.89	88.77	79.05	98.71	90.01	91.37	97.24	94.57	95.88	939.38

APPENDIX F

Scenario 2 - Worst-First Approach

Asset ID	Name	Start Position	End Position	Functional Class	Roadside Environment	Service Type	Surface Type	Condition Index (CI)	Assessment Year	Reconstruction Treatment	Unit Cost	Replacement Cost	Treatment Timing
3091	Angstrom Crescent	Point West Drive (south)	Point West Drive (north)	Local	Urban	Residential	Concrete	0	2021	PCC-FullDepthRepair	130.00	429,413	NOW
1143	Lilac Court	McCurdy Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Ovly	20.00	11,388	NOW
1144	Poplar Court	McCurdy Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Ovly	20.00	13,141	NOW
1199	Seymour Street	Richmond Street	Murray Street	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Recon 90HMA	170.00	110,078	NOW
3072	Shangrila Street	Dot Street	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Recon 90HMA	170.00	131,835	NOW
1040	Spring Court	Venetian Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Ovly	20.00	17,304	NOW
1058	Wilkinson Court	Hamilton Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Ovly	20.00	8,687	NOW
1200	Wilkinson Court	Hamilton Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	0	2021	HMA-Ovly	20.00	17,600	NOW
1020	Atlantic Court	Atlantic Avenue	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	2	2021	HMA-Ovly	20.00	10,601	NOW
3078	Dot Street	Shangrila Street	Canal Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	2	2021	HMA-Recon 90HMA	170.00	153,060	NOW
2080	Smith Road	South Sideroad - Malden	Malden Colchester South	Local	Rural	Residential	Surface Treated	4	2021	Full Depth Reclamation (FDR) + Dout	13.00	107,084	NOW
1141	Linden Crescent	McCurdy Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	5	2021	HMA-Ovly	20.00	17,472	NOW
1039	Holiday Court	Venetian Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	8	2021	HMA-Ovly	20.00	19,006	NOW
1088	Laird Avenue North	Alma Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	11	2021	HMA-Ovly	20.00	17,982	NOW
3089	Wyandotte Street	Point West Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	12	2021	DONE in 2021		0	NOW
1159	Crownridge Boulevard	Pine Ridge Avenue	Sandwich Street South	Local	Urban	Residential	Hot Mix Asphalt	13	2021	HMA-Ovly	20.00	41,887	NOW
1046	Marvin Gardens	Virginia Avenue	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	13	2021	HMA-Ovly	20.00	20,160	NOW
1142	Oak Court	McCurdy Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	14	2021	HMA-Ovly	20.00	11,603	NOW
1094	Murray Street	Sandwich Street South	Seymour Street	Local	Urban	Residential	Hot Mix Asphalt	15	2021	HMA-Recon 90HMA	170.00	109,563	NOW
1134	Victoria Street South	Cherrylaw Crescent	Pickering Drive	Local	Urban	Residential	Hot Mix Asphalt	15	2021	HMA-Ovly	20.00	14,305	NOW
3052	Mill St	Essex County Road 11	Culdasac	Local	Semi-Urban	Commercial	Hot Mix Asphalt	16	2021	HMA-Ovly	20.00	10,454	NOW
1092	Murray Street	King Street	George Street	Local	Urban	Residential	Hot Mix Asphalt	16	2021	HMA-Ovly	20.00	13,416	NOW
1131	Victoria Street South	Simcoe Street	Cherrylaw Crescent	Local	Urban	Residential	Hot Mix Asphalt	16	2021	HMA-Ovly	20.00	32,074	NOW
1158	Ridgewood Place North	Crownridge Boulevard	Thorn Ridge Avenue	Local	Urban	Residential	Hot Mix Asphalt	17	2021	HMA-Ovly	20.00	28,152	NOW
1104	Gore Street	Ramsay Street	Dalhousie Street	Local	Urban	Residential	Paver Interlock	18	2021	Paver Interlock-Recon	247.32	144,089	NOW
2044	Mickle Drive	Front Road South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	18	2021	HMA-Ovly	20.00	18,329	NOW
2059	Smith Road	Middle Sideroad - Malden	Essex County Road 18 (Pike Road)	Local	Rural	Residential	Surface Treated	18	2021	Full Depth Reclamation (FDR) + Dout	13.00	94,151	NOW
1112	Brock Street	Gore Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	19	2021	HMA-Recon 90HMA	170.00	241,774	NOW
1198	Heaton Street	Culdasac	Gibb Street	Local	Urban	Residential	Hot Mix Asphalt	20	2021	HMA-Ovly	20.00	9,020	NOW
3088	Point West Drive	Essex County Road 10 (west)	Angstrom Crescent	Local	Urban	Residential	Hot Mix Asphalt	20	2021	DONE in 2021		0	NOW
3090	Point West Drive	Angstrom Crescent	Essex County Road 10 (east)	Local	Urban	Residential	Hot Mix Asphalt	20	2021	HMA-Ovly	20.00	75,555	NOW
3063	Beneteau Drive	Hyde Park Road	Concession 3 North	Local	Urban	Residential	Hot Mix Asphalt	21	2021	HMA-Ovly	20.00	29,009	NOW
3073	Centre Street	Dot Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	21	2021	HMA-Recon 90HMA	169.00	127,764	NOW
1101	Gore Street	Sandwich Street South	Seymour Street	Local	Urban	Residential	Hot Mix Asphalt	21	2021	HMA-Recon 90HMA	170.00	128,442	NOW
2047	McDonald Avenue	Front Road South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	21	2021	HMA-Ovly	20.00	28,307	NOW
3068	David Crescent	Beneteau Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	22	2021	HMA-Ovly	20.00	29,464	NOW
1021	Heaton Street	Culdasac	Gibb Street	Local	Urban	Residential	Hot Mix Asphalt	22	2021	HMA-Ovly	20.00	14,499	NOW
1123	King Street	Park Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	23	2021	HMA-Recon 90HMA	170.00	399,629	NOW
1100	Gore Street	King Street	George Street	Local	Urban	Residential	Hot Mix Asphalt	24	2021	HMA-Ovly	20.00	14,445	NOW
1008	Kentucky Avenue	Alma Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	24	2021	HMA-Ovly	20.00	73,763	NOW
1062	Victoria Street South	Military Street	Alma Street	Local	Urban	Residential	Hot Mix Asphalt	24	2021	HMA-Recon 90HMA	170.00	498,760	NOW
3051	Wellington Street	Blue Street	Essex County Road 11 (Walker Road)	Local	Semi-Urban	Residential	Hot Mix Asphalt	24	2021	HMA-Ovly	20.00	23,107	NOW
1185	Gore Street	Seymour Street	King Street	Local	Urban	Commercial	Hot Mix Asphalt	25	2021	HMA-Ovly	20.00	14,474	NOW
3054	McGregor Court	Gardiner Crescent	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	25	2021	HMA-Ovly	20.00	10,659	NOW
1022	Heaton Street	Culdasac	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	26	2021	HMA-Ovly	20.00	19,106	NOW
1093	Murray Street	Seymour Street	King Street	Local	Urban	Residential	Hot Mix Asphalt	26	2021	HMA-Ovly	20.00	12,512	NOW
1028	Ventnor Avenue	Ventnor Avenue	Atlantic Avenue	Local	Urban	Residential	Hot Mix Asphalt	26	2021	HMA-Ovly	20.00	51,825	NOW
1070	Bertrand Avenue	Alma Street	St. Arnaud Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	27	2021	HMA-Recon 90HMA	170.00	273,564	NOW
3065	Lamp Road	Beneteau Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	27	2021	DONE in 2021		0	NOW
2048	Hunter Avenue	Front Road South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	28	2021	HMA-Ovly	20.00	34,184	NOW
1180	Boblo Island Boulevard	Ferry Docking	Crystal Bay Drive	Collector	Semi-Urban	Residential	Hot Mix Asphalt	29	2021	HMA-Recon 90HMA	170.00	638,071	NOW
3112	Marsh Court	Knobb Hill Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	29	2021	HMA-Ovly	20.00	10,488	NOW
1091	Murray Street	George Street	Brock Street	Local	Urban	Residential	Hot Mix Asphalt	29	2021	HMA-Ovly	20.00	12,109	NOW
1025	Baltic Avenue	Gibb Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	30	2021	HMA-Ovly	20.00	56,236	NOW
1148	Deer Ridge Court	Crownridge Boulevard	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	30	2021	HMA-Ovly	20.00	13,219	NOW
1049	Fryer Street	Alma Street	Fort Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	30	2021	DONE in 2021		0	NOW
3059	Lydia Court	Beneteau Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	30	2021	HMA-Ovly	20.00	23,813	NOW
1090	Murray Street	Wolfe Street	Victoria Street South	Local	Urban	Residential	Hot Mix Asphalt	30	2021	HMA-Ovly	20.00	16,525	NOW
3058	Sari Lane	Culdasac	North Sideroad	Local	Rural	Residential	Hot Mix Asphalt	30	2021	HMA-Recon 90HMA Rural	99.00	160,452	NOW
1111	George Street	Simcoe Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	31	2021	HMA-FDARR & 2ovly	45.00	90,648	NOW
3055	South Riverview Drive	Concession 2 North	Beneteau Drive	Collector	Semi-Urban	Residential	Hot Mix Asphalt	31	2021	HMA-FDARR & 2ovly	45.00	261,189	NOW
1055	Hamilton Drive	Victoria Street South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	32	2021	HMA-FDARR & 2ovly	45.00	66,717	NOW
1079	Rankin Avenue	Dalhousie Street	Sandwich Street South	Local	Urban	Residential	Hot Mix Asphalt	32	2021	HMA-FDARR & 2ovly	45.00	106,908	NOW
3160	Windemere Place	Culdasac	Culdasac	Local	Urban	Residential	Paver Interlock	32	2021	Paver Interlock-Recon	247.32	264,286	NOW
3096	Wright Avenue	Turner Crescent	Essex County Road 10	Local	Urban	Residential	Hot Mix Asphalt	32	2021	HMA-FDARR & 2ovly	45.00	56,386	NOW
1132	Concession 1 North	Middle Sideroad - Anderdon (Essex)	Concession 1 North	Local	Rural	Residential	Hot Mix Asphalt	32	2021	HMA-FDARR & 2ovly	45.00	28,541	NOW
1138	McCurdy Drive	Sandwich Street South	Oak Court	Local	Urban	Residential	Hot Mix Asphalt	33	2021	HMA-FDARR & 2ovly	45.00	96,711	NOW
1155	Royal Ridge Court	Crownridge Boulevard	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	33	2021	HMA-FDARR & 2ovly	45.00	13,829	NOW
1109	Seymour Street	Simcoe Street	Murray Street	Local	Urban	Residential	Hot Mix Asphalt	33	2021	HMA-FDARR & 2ovly	45.00	106,294	NOW
3007	Concession 2 North	Middle Sideroad - Anderdon (County)	North Sideroad	Local	Rural	Residential	Hot Mix Asphalt	34	2021	HMA-Recon 90HMA Rural	99.00	1,642,743	NOW
2010	Concession 6 South	Essex County Road 18 (Pike Road)	South Sideroad	Local	Rural	Residential	Hot Mix Asphalt	35	2021	HMA-Recon 90HMA Rural	100.00	1,263,702	NOW
1102	Gore Street	Bathurst Street	Ramsay Street	Local	Urban	Residential	Paver Interlock	35	2021	Paver Interlock-Recon	247.32	158,149	NOW
1014	Mediterranean Avenue	Pacific Avenue	Mediterranean Avenue	Local	Urban	Residential	Hot Mix Asphalt	35	2021	HMA-FDARR & 2ovly	45.00	37,951	NOW
1017	Virginia Avenue	States Avenue	States Avenue	Local	Urban	Residential	Hot Mix Asphalt	35	2021	HMA-FDARR & 2ovly	45.00	227,599	NOW
3022	Concession 8	Alma Street	Texas Road	Local	Rural	Residential	Hot Mix Asphalt	36	2021	HMA-Recon 90HMA Rural	99.00	1,161,009	NOW
1080	North Street	Sandwich Street South	Dalhousie Street	Local	Urban	Residential	Hot Mix Asphalt	36	2021	HMA-FDARR & 2ovly	45.00	100,233	NOW
3067	Alta B Crescent	Hyde Park Road	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	37	2021	HMA-FDARR & 2ovly	45.00	51,441	NOW
3103	Baker Crescent	Whelan Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	37	2021	HMA-FDARR & 2ovly	45.00	50,432	NOW
3066	Hyde Park Road	Beneteau Drive (north)	Beneteau Drive (south)	Local	Urban	Residential	Hot Mix Asphalt	37	2021	HMA-FDARR & 2ovly	45.00	227,378	NOW
1182	Red Oak Crescent	Boblo Island Boulevard	Boblo Island Boulevard	Local	Semi-Urban	Residential	Paver Interlock	37	2021	Paver Interlock-Recon	247.32	183,699	NOW
1027	Ventnor Avenue	Baltic Avenue	Ventnor Avenue	Local	Urban	Residential	Hot Mix Asphalt	37	2021	HMA-FDARR & 2ovly	45.00	89,208	NOW
1036	Boardwalk Avenue	States Avenue	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	182,461	NOW
1149	Cedar Ridge Avenue	Culdasac	Thorn Ridge Avenue	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	42,292	NOW
1099	Clubview Drive	Inwood Drive	Links Drive	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	101,549	NOW
3003	Concession 5 North	Essex County Road 8	North Sideroad	Local	Rural	Residential	Hot Mix Asphalt	38	2021	HMA-Recon 90HMA Rural	99.00	1,435,953	NOW
1156	Crownridge Boulevard	Pine Ridge Avenue	Briar Ridge Avenue	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	82,934	NOW
1139	McCurdy Drive	Oak Court	Walnut Drive	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	110,716	NOW
1204	Murray Street	Brock Street	End	Local	Semi-Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	13,693	NOW
2046	Park Avenue	Front Road South	Front Road South	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	92,603	NOW
1157	Pine Ridge Avenue	Crownridge Boulevard	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	38,628	NOW
1001	Scott Drive	Front Road South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	38	2021	HMA-FDARR & 2ovly	45.00	40,897	NOW
1029	Atlantic Avenue	Culdasac	Pacific Avenue	Local	Urban	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	68,796	NOW
3013	Concession 3 North	Middle Sideroad - Anderdon (Essex)	Texas Road	Local	Rural	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	528,682	NOW
2069	Lakewood Drive	McLeod Avenue	Ridgewood Lane	Local	Semi-Urban	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	143,505	NOW
2074	McLeod Avenue	Change in Pavement (MN # 438)	Concession 3 South	Collector	Semi-Urban	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	158,902	NOW
3079	Union Street	Waterfoam Street	Canal Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	50,193	NOW
2043	Woodbridge Drive	Front Road South	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	39	2021	HMA-FDARR & 2ovly	45.00	38,485	NOW
3017	Concession 8	Texas Road	Middle Sideroad - Anderdon (Essex)	Local	Rural	Residential	Hot Mix Asphalt	40	2021	HMA-Recon 90HMA Rural	99.00	1,186,807	NOW
1190	Gore Street	Sandwich Street	Bathurst Street	Local	Urban	Residential	Paver Interlock	40	2021	Paver Interlock-Recon	130.00	83,292	NOW
3076	Seacrest Drive	Union Street	County Road 20	Local	Semi-Urban	Residential	Hot Mix Asphalt	40	2021	HMA-FDARR & 2ovly	45.00	22,721	NOW
2049	Erie Avenue	Front Road South	Culdasac	Local	Semi-Urban	Residential							

1181	Crystal Bay Drive	Boblo Island Boulevard	Gold Coast Drive	Local	Semi-Urban	Residential	Hot Mix Asphalt	45	2021 HMA-FDARR & 20vly	45.00	292,102	1-5 Years
1081	Dalhousie Street	Richmond Street	Fort Malden Dr	Local	Urban	Residential	Hot Mix Asphalt	45	2021 HMA-FDARR & 20vly	45.00	173,732	1-5 Years
2085	McLeod Avenue	3rd Concession South	Lakewood Dr	Collector	Semi-Urban	Residential	Hot Mix Asphalt	45	2021 HMA-FDARR & 20vly	45.00	138,932	1-5 Years
1004	Tennessee Crescent	Kentucky Street (north)	Kentucky Street (south)	Local	Urban	Residential	Hot Mix Asphalt	45	2021 HMA-FDARR & 20vly	45.00	138,043	1-5 Years
1011	Vermont Drive	Richmond Street	Indiana Place	Local	Urban	Residential	Hot Mix Asphalt	45	2021 HMA-FDARR & 20vly	45.00	182,965	1-5 Years
1150	Crownridge Boulevard	Briar Ridge Avenue	Fryer Street	Local	Urban	Residential	Hot Mix Asphalt	46	2021 HMA-FDARR & 20vly	45.00	106,425	1-5 Years
3100	Links Drive	Clubview Drive (west)	Clubview Drive (east)	Local	Urban	Residential	Hot Mix Asphalt	46	2021 HMA-FDARR & 20vly	45.00	91,102	1-5 Years
1154	Castle Ridge Court	Stone Ridge Avenue	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	47	2021 HMA-FDARR & 20vly	45.00	17,181	1-5 Years
1003	Illinois Street	Kentucky Street	Eggleton Court	Local	Urban	Residential	Hot Mix Asphalt	47	2021 HMA-FDARR & 20vly	45.00	63,079	1-5 Years
1012	Indiana Place	Richmond Street	Mediterranean Avenue	Local	Urban	Residential	Hot Mix Asphalt	47	2021 HMA-FDARR & 20vly	45.00	138,375	1-5 Years
1053	Main Street South	Fort Street	Military Street	Local	Urban	Residential	Hot Mix Asphalt	47	2021 HMA-FDARR & 20vly	45.00	55,805	1-5 Years
3106	Whelan Drive	Culdasac	Cambridge Court (West)	Local	Urban	Residential	Hot Mix Asphalt	47	2021 HMA-FDARR & 20vly	45.00	142,022	1-5 Years
1113	Brook Street	Simcoe Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	100,888	1-5 Years
3099	Clubview Drive	Links Drive	Essex County Road 10	Local	Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	345,823	1-5 Years
3021	Concession 6 North	Alma Street	Texas Road	Local	Rural	Residential	Hot Mix Asphalt	48	2021 HMA-Recon 90HMA Rural	99.00	1,089,574	1-5 Years
1017	Haier Court	Bratt Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	33,982	1-5 Years
3102	Kingsbridge Drive	Essex County Road 20	Whelan Drive	Local	Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	137,416	1-5 Years
1119	Seymour Street	Park Street	Simcoe Street	Local	Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	35,159	1-5 Years
3048	Thomas Road	Alma Street	Texas Road	Local	Semi-Urban	Residential	Hot Mix Asphalt	48	2021 HMA-FDARR & 20vly	45.00	695,671	1-5 Years
3074	Canal Street	County Road 20	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	49	2021 HMA-FDARR & 20vly	45.00	74,423	1-5 Years
1133	Hawthorn Crescent	Pickering Drive	Pickering Drive	Local	Urban	Residential	Hot Mix Asphalt	49	2021 HMA-FDARR & 20vly	45.00	226,318	1-5 Years
1075	Richmond Street	Victoria Street	Balaclava Street South	Collector	Urban	Residential	Hot Mix Asphalt	49	2021 HMA-FDARR & 30vly	65.00	239,207	1-5 Years
2035	Lowes Sideroad	Meloche Road	Fryer Street	Local	Rural	Residential	Surface Treated	49	2021 Double Surface Treatment (Chip Sea	10.00	88,185	1-5 Years
3148	Boyle Street	Lundy St	Lambert St	Local	Urban	Residential	Hot Mix Asphalt	50	2021 HMA-FDARR & 20vly	45.00	44,676	1-5 Years
2012	Concession 9	Essex County Road 18 (Pike Road)	South Sideroad	Local	Rural	Residential	Gravel	50	2021 Rehabilitation	10.00	19,268	1-5 Years
3111	Easy Street	Knob Hill Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	50	2021 HMA-FDARR & 20vly	45.00	43,616	1-5 Years
2077	Front Road South	Essex County Road 20	Erie Avenue	Collector	Urban	Residential	Hot Mix Asphalt	50	2021 HMA-FDARR & 20vly	45.00	334,695	1-5 Years
2073	McLeod Avenue	Warren Mickie Park	Change in Pavement (MN # 438)	Collector	Semi-Urban	Residential	Gravel	50	2021 Rehabilitation HT	10.00	15,883	1-5 Years
3018	Concession 3 North	Texas Road	Alma Street	Local	Rural	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	514,085	1-5 Years
1168	Fryer Street	Pickering Street	Simcoe Street	Local	Urban	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	81,698	1-5 Years
1064	Military Street	Fryer Street	Victoria Street	Local	Urban	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	83,840	1-5 Years
3023	North Sideroad	Concession 2 North	Concession 3 North	Local	Rural	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	416,221	1-5 Years
1034	Richmond Street	Fryer Street	Boardwalk Avenue	Collector	Urban	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	108,707	1-5 Years
1023	Sullivan Street	Gib Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	46,949	1-5 Years
1167	Wigle Street	Bastien Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	51	2021 HMA-FDARR & 20vly	45.00	41,234	1-5 Years
2053	Lakeside Drive	Culdasac (west)	Private Lane	Local	Rural	Residential	Surface Treated	52	2021 Single Surface Treatment (Chip Seal)	5.00	27,821	1-5 Years
3049	Birdie Street	Eagle Crescent	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	52	2021 HMA-FDARR & 20vly	45.00	35,150	1-5 Years
1074	Gibb Street	Fryer Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	52	2021 HMA-FDARR & 20vly	45.00	81,988	1-5 Years
2072	McLeod Avenue	Erie Avenue	Warren Mickie Park	Collector	Urban	Residential	Hot Mix Asphalt	52	2021 HMA-FDARR & 20vly	45.00	63,818	1-5 Years
1097	Murray Street	Dalhousie Street	Ramsay Street	Local	Urban	Residential	Hot Mix Asphalt	52	2021 HMA-FDARR & 20vly	45.00	30,480	1-5 Years
3075	Silver Sand Drive	Union Street	County Road 20	Local	Semi-Urban	Residential	Hot Mix Asphalt	52	2021 HMA-FDARR & 20vly	45.00	22,448	1-5 Years
1007	Allen Court	Richmond Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	47,872	1-5 Years
3060	Beneteau Drive	South Riverview Drive	Lydia Court	Local	Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	54,458	1-5 Years
2041	Cooper Lane	Front Road South	Lakebeach Rd	Local	Semi-Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	30,280	1-5 Years
3092	Golfwood Drive	Essex County Road 10	Turner Crescent	Local	Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	87,138	1-5 Years
1070	King Street	Simcoe Street	Park Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	36,666	1-5 Years
2070	Lakewood Drive	McLeod Avenue	Culdasac (MN # 534)	Local	Semi-Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	336,474	1-5 Years
1013	Mediterranean Avenue	Bratt Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	291,804	1-5 Years
1033	Richmond Street	Boardwalk Avenue	States Avenue	Collector	Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	107,663	1-5 Years
2067	Willow Beach Road	Concession 3 North	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	53	2021 HMA-FDARR & 20vly	45.00	154,818	1-5 Years
1175	Duff Avenue	Sandwich Street North	Girard Street	Local	Urban	Residential	Hot Mix Asphalt	54	2021 HMA-FDARR & 20vly	45.00	178,675	1-5 Years
3071	Emerald Lane	County Road 20	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	54	2021 HMA-FDARR & 20vly	45.00	80,835	1-5 Years
2065	Woodland Lane	Claremont Dr	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	54	2021 HMA-FDARR & 20vly	45.00	21,330	1-5 Years
1074	Alma Street	Sandwich Street North	Balaclava Street	Collector	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	65.00	211,739	1-5 Years
3117	Alma Street	7th Concession	Essex County Road 9 (Howard Avenue)	Local	Rural	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	101,364	1-5 Years
1166	Bastien Street	Dalhousie Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	102,128	1-5 Years
3121	Colony Court	Old Colony Trail	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	17,100	1-5 Years
3009	Concession 4 North	Middle Sideroad- Anderdon (Essex C	North Sideroad	Local	Rural	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	768,474	1-5 Years
2004	Concession 6 South	Alma Street	Essex County Road 18 (Pike Road)	Local	Rural	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	362,102	1-5 Years
1105	Dalhousie Street	Gore Street	Murray Street	Local	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	54,990	1-5 Years
1126	Fryer Street	Simcoe Street	Gibb Street	Local	Rural	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	89,593	1-5 Years
2040	Goodview Avenue	Front Road South	Cooper Lane	Local	Semi-Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	45,028	1-5 Years
3131	Marsh Drive	Knob Hill Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	48,632	1-5 Years
3135	Park Lane Circle	Golfview Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	55	2021 HMA-FDARR & 20vly	45.00	48,564	1-5 Years
3041	Alma Street	Concession 6 South	Concession 4 North	Local	Rural	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	546,118	1-5 Years
1071	Balaclava Street	Alma Street	Fort Street	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	103,550	1-5 Years
1146	Briar Ridge Avenue	Fryer Street	Crownridge Boulevard	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	132,929	1-5 Years
1173	Brunner Avenue	Sandwich Street North	Girard Street	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	164,628	1-5 Years
3047	Driver Lane	Eagle Crescent	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	41,909	1-5 Years
1118	Fort Street	Victoria Street South	Balaclava Street	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	175,892	1-5 Years
3052	Gardner Crescent	Essex County Road 10	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	178,164	1-5 Years
1005	Illinois Street	Brush Court	Eggleton Court	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	146,147	1-5 Years
3131	Lavers Crescent	McLellan Ave	End	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	82,296	1-5 Years
1192	Riverfront Park Crescent	Sandwich Street	Sandwich Street	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	99,612	1-5 Years
1179	William Street	Girard Street	Sandwich Street North	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	152,892	1-5 Years
1098	Wolfe Street	Richmond Street	Hamilton Drive	Local	Urban	Residential	Hot Mix Asphalt	56	2021 HMA-FDARR & 20vly	45.00	54,216	1-5 Years
1107	Bathurst Street	Murray Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	57	2021 HMA-FDARR & 20vly	45.00	43,605	1-5 Years
1006	Brush Crescent	Illinois Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	57	2021 HMA-FDARR & 20vly	45.00	195,307	1-5 Years
3002	Concession 4 North	North Sideroad	Essex Road 8	Local	Rural	Residential	Hot Mix Asphalt	57	2021 HMA-FDARR & 20vly	45.00	759,339	1-5 Years
1178	Girard Street	William Avenue	William Street	Local	Urban	Residential	Hot Mix Asphalt	57	2021 HMA-FDARR & 20vly	45.00	151,511	1-5 Years
2003	Concession 5 South	Essex County Road 18 (Pike Road)	Alma Street	Local	Rural	Residential	Surface Treated	57	2021 Single Surface Treatment (Chip Seal)	5.00	38,994	1-5 Years
1197	Fort Street	Balaclava Street	Sandwich Street South	Local	Urban	Residential	Hot Mix Asphalt	58	2021 HMA-FDARR & 20vly	45.00	152,159	1-5 Years
3080	Golfview Drive	Essex County Road 10	Linwood Drive	Local	Urban	Residential	Hot Mix Asphalt	58	2021 HMA-FDARR & 20vly	45.00	196,556	1-5 Years
3120	Greenway Court	Old Colony Trail	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	58	2021 HMA-FDARR & 20vly	45.00	17,460	1-5 Years
1085	Maple Avenue	Sandwich Street	Laird Avenue	Local	Urban	Residential	Hot Mix Asphalt	58	2021 HMA-FDARR & 20vly	45.00	51,197	1-5 Years
3064	Ryan Street	Beneteau Drive	Ryan Street	Local	Urban	Residential	Hot Mix Asphalt	58	2021 HMA-FDARR & 20vly	45.00	209,039	1-5 Years
2009	Concession 5 South	South Sideroad	Essex County Road 18 (Pike Road)	Local	Rural	Residential	Surface Treated	58	2021 Single Surface Treatment (Chip Seal)	5.00	99,774	1-5 Years
1059	Lowes Sideroad	Lowes Sideroad	Fryer Street (County Road 20)	Local	Rural	Residential	Surface Treated	58	2021 Double Surface Treatment (Chip Sea	10.00	13,479	1-5 Years
1016	Bratt Drive	Richmond Street	Simcoe Street	Local	Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	180,465	1-5 Years
3101	Fescue Lane	Clubview Drive (east)	Clubview Drive (west)	Local	Semi-Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	73,015	1-5 Years
1051	Fryer Street	Military Street	Richmond Street	Local	Semi-Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	88,068	1-5 Years
3114	Knob Hill Drive	Texas Road	Whelan Dr	Local	Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	513,586	1-5 Years
1037	Riviera Place	Riviera Drive	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	27,972	1-5 Years
3152	Westcott Road	McLellan Ave	Livingstone Cr	Local	Urban	Residential	Hot Mix Asphalt	59	2021 HMA-FDARR & 20vly	45.00	44,748	1-5 Years
3040	Alma Street	Concession 4 North	Concession 4 South	Local	Rural	Residential	Hot Mix Asphalt	60	2021 HMA-FDARR & 20vly	45.00	272,177	1-5 Years
3042	Alma Street	Concession 6 South	Concession 7	Local	Rural	Residential	Hot Mix Asphalt	60	2021 HMA-FDARR & 20vly	45.00	399,973	1-5 Years
2039	Beaudoin Sideroad	Front Road South	Culdasac	Local	Semi-Urban	Residential	Gravel	60	2021 Rehabilitation	10.00	690	1-5 Years
3104	Cambridge Court	Whelan Drive (East)	Whelan Drive (West)	Local	Urban	Residential	Hot Mix Asphalt	60	2021 HMA-FDARR & 20vly	45.00	108,569	1-5 Years
2087	Claremont Lane	Essex Blvd	Ridgewood Lane									

3016	Concession 6 North	Texas Road	Middle Sideroad - Anderdon (Essex	Local	Rural	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	232,243	5-10 Years
2032	Durango Avenue	St. Therese Avenue	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	11,841	5-10 Years
3137	Eagle Crescent	Middle Sideroad - Anderdon (west)	Middle Sideroad - Anderdon (east)	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	104,672	5-10 Years
3097	Ironwood Drive	Essex County Road 10	Ironwood Drive	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	126,554	5-10 Years
2156	Meadowdale Avenue	Cul-de-Sac	Pearson	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	41,488	5-10 Years
2075	Ridgewood Lane	Mcleod Avenue	Ironwood Drive	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	34,056	5-10 Years
1044	Tofflemire Street	Alma Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	64	2021 HMA-Ovly	20.00	35,572	5-10 Years
2071	Claremont Lane	Tilford Lane	Essex Blvd	Collector	Rural	Residential	Hot Mix Asphalt	65	2021 HMA-Ovly	20.00	30,299	5-10 Years
2006	Concession 9	Alma Street	Essex County Road 18 (Pike Road)	Local	Rural	Residential	Gravel	65	2021 Rehabilitation	10.00	12,528	5-10 Years
1169	Fryer Street	Briar Ridge Avenue	Pickering Drive	Local	Semi-Urban	Residential	Hot Mix Asphalt	65	2021 HMA-Ovly	20.00	53,013	5-10 Years
1174	Grant Avenue	Girard Street	Sandwich Street North	Local	Urban	Residential	Hot Mix Asphalt	65	2021 HMA-Ovly	20.00	70,000	5-10 Years
1045	Main Street North	Culdasac	Alma Street	Local	Urban	Residential	Hot Mix Asphalt	65	2021 HMA-Ovly	20.00	37,514	5-10 Years
1019	Martin Crescent	Simcoe Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	65	2021 HMA-Ovly	20.00	51,427	5-10 Years
2029	South Sideroad	Concession 9	Colchester South 1 Malden Townline	Local	Rural	Residential	Gravel	65	2021 Rehabilitation HT	10.00	11,339	5-10 Years
3031	Texas Road	Concession 3 North (Fox Road)	Concession 4 North	Local	Rural	Residential	Gravel	65	2021 Rehabilitation	10.00	13,753	5-10 Years
3034	Texas Road	Concession 6 North	Essex County Road 9 (Howard Avenue Local	Rural	Residential	Gravel	65	2021 Rehabilitation	10.00	13,669	5-10 Years	
3036	Texas Road	Concession 8	Closure of Road - Dead End	Local	Rural	Residential	Gravel	65	2021 Rehabilitation	10.00	6,249	5-10 Years
2056	Levergood Lane	Culdasac (east)	Culdasac (west)	Local	Rural	Residential	Surface Treated	66	2021 Single Surface Treatment (Chip Seal)	5.00	5,294	5-10 Years
1069	Balacava Street	St. Arnaud Street	Alma Street	Local	Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	31,623	5-10 Years
2017	Concession 7	Essex County Road 20	Middle Sideroad - Malden	Local	Rural	Residential	Surface Treated	66	2021 Single Surface Treatment (Chip Seal)	5.00	68,664	5-10 Years
3151	Livingstone Crescent	McLellan Ave	Fort Street	Local	Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	78,272	5-10 Years
1052	Main Street South	Alma Street	Knob Hill Rd	Local	Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	29,876	5-10 Years
3149	McLellan Avenue	End	Knob Hill Rd	Local	Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	101,269	5-10 Years
3046	Smith Industrial Drive	Essex County Road 9 (Howard Avenue	Culdasac	Local	Semi-Urban	Commercial	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	109,220	5-10 Years
3056	South Riverview Drive	Beneteau Drive	Malden Road (Essex County Road 8)	Collector	Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	102,134	5-10 Years
3070	Thrasher Drive	County Road 20	Culdasac	Local	Semi-Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	49,157	5-10 Years
2086	Tilford Lane	Ridgewood Lane	Essex Blvd	Local	Semi-Urban	Residential	Hot Mix Asphalt	66	2021 HMA-Ovly	20.00	16,240	5-10 Years
1117	Bathurst Street	Park Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	37,615	5-10 Years
1201	Briar Ridge Avenue	Cedar Ridge Ave	Crownridge Boulevard	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	27,872	5-10 Years
1132	Cherrylawn Crescent	Pickering Drive	Pickering Drive	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	82,791	5-10 Years
3010	Concession 5 North	North Sideroad	Middle Sideroad - Anderdon (Essex	Local	Rural	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	332,411	5-10 Years
3132	Higgins Crescent	McLellan Ave (West)	McLellan Ave (East)	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	66,672	5-10 Years
1082	Laird Avenue South	North Street	Maple Avenue	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	48,332	5-10 Years
1078	Richmond Street	Sandwich Street South	Dalhousie Street	Collector	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	58,303	5-10 Years
1193	River Walk Crescent	Gold Coast Drive	Gold Coast Drive	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	42,144	5-10 Years
1048	States Avenue	Alma Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	82,928	5-10 Years
1099	Wolfe Street	Hamilton Drive	Brock Street	Local	Urban	Residential	Hot Mix Asphalt	67	2021 HMA-Ovly	20.00	26,104	5-10 Years
2033	Collison Sideroad	Essex County Road 41	Concession 7 South	Local	Rural	Residential	Surface Treated	68	2021 Single Surface Treatment (Chip Seal)	5.00	48,599	5-10 Years
3136	Concession 6 South	County Road 20	South Sideroad	Local	Rural	Residential	Hot Mix Asphalt	68	2021 HMA-Ovly	20.00	294,716	5-10 Years
1188	George Street	Richmond Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	68	2021 HMA-Ovly	20.00	35,790	5-10 Years
3083	Linwood Drive	Golfview Drive	Essex County Road 10	Local	Semi-Urban	Residential	Hot Mix Asphalt	68	2021 HMA-Ovly	20.00	64,219	5-10 Years
3086	Park Lane Circle	Golfview Drive	Golfview Drive	Local	Semi-Urban	Residential	Hot Mix Asphalt	68	2021 HMA-Ovly	20.00	171,387	5-10 Years
1066	Victoria Street South	Richmond Street	Simcoe Street	Local	Urban	Residential	Hot Mix Asphalt	68	2021 HMA-Ovly	20.00	121,410	5-10 Years
2008	Concession 4 South	Essex County Road 18 (Pike Road)	South Sideroad	Local	Rural	Residential	Surface Treated	68	2021 Single Surface Treatment (Chip Seal)	5.00	61,530	5-10 Years
1203	Fraser Ave	Duff Ave	William St	Local	Urban	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	63,688	5-10 Years
3112	Hilton Court	Whelan Ave (West)	Whelan Ave (East)	Local	Urban	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	30,680	5-10 Years
1043	Renaud Street	Alma Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	28,369	5-10 Years
1067	St. Arnaud Street	Balacava Street	Victoria Street South	Local	Semi-Urban	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	62,621	5-10 Years
3107	Whelan Drive	Cambridge Court (West)	Knobb Hill Drive	Local	Urban	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	77,900	5-10 Years
3025a	North Sideroad	Concession 4 North	200m west of Concession 4	Local	Rural	Residential	Hot Mix Asphalt	69	2021 HMA-Ovly	20.00	22,000	5-10 Years
2014	Concession 4 South	Middle Sideroad - Malden	Essex County Road 20	Local	Rural	Residential	Surface Treated	69	2021 Full Depth Reclamation (FDR) + Dout	10.00	127,017	5-10 Years
2034	Collison Sideroad	Concession 7	Essex County Road 50	Local	Rural	Residential	Surface Treated	70	2021 Single Surface Treatment (Chip Seal)	5.00	22,076	5-10 Years
3159	Caldwell Court	Pearson St	CuldeSac	Local	Urban	Residential	Hot Mix Asphalt	70	2021 HMA-Ovly	20.00	12,800	5-10 Years
2019	Concession 7	Essex County Road 20	Collison Sideroad	Local	Rural	Residential	Gravel	70	2021 Rehabilitation	10.00	19,247	5-10 Years
3119	King Street	Richmond Street	Gore Street	Local	Urban	Residential	Hot Mix Asphalt	70	2021 HMA-Ovly	20.00	34,656	5-10 Years
1187	McBride Road	Mcleod Avenue	Willow Beach Road	Local	Urban	Residential	Hot Mix Asphalt	70	2021 HMA-Ovly	20.00	67,856	5-10 Years
3110	McLellan Avenue	Knobb Hill Drive	Pettypiece Dr	Local	Urban	Residential	Hot Mix Asphalt	70	2021 HMA-Ovly	20.00	122,987	5-10 Years
1122	Park Street	Culdasac	Sandwich Street South	Local	Urban	Residential	Hot Mix Asphalt	70	2021 HMA-Ovly	20.00	39,974	5-10 Years
3033	Texas Road	Concession 5 North	Concession 6 North	Local	Rural	Residential	Gravel	70	2021 Rehabilitation	10.00	75,499	5-10 Years
2037	Lowes Sideroad	Sandwich Street South (Essex County	Dalhousie Street	Local	Rural	Residential	Surface Treated	70	2021 Single Surface Treatment (Chip Seal)	5.00	5,866	5-10 Years
2026	South Sideroad	Concession 6 South	Concession 7	Local	Rural	Residential	Surface Treated	70	2021 Double Surface Treatment (Chip Seal)	10.00	13,194	5-10 Years
3119	Golfview Drive	Essex County Road 10	Linwood Drive	Local	Urban	Residential	Hot Mix Asphalt	71	2021 HMA-Ovly	20.00	122,224	5-10 Years
2033	Oxford Crescent Drive (East)	Whelan Drive (West)	Whelan Drive (West)	Local	Urban	Residential	Hot Mix Asphalt	71	2021 HMA-Ovly	20.00	54,522	5-10 Years
3157	Pearson Street	Ironside St	Meadowview St	Local	Urban	Residential	Hot Mix Asphalt	71	2021 HMA-Ovly	20.00	41,312	5-10 Years
3143	Whelan Drive	Hilton Crt	Lavers Cr	Local	Urban	Residential	Hot Mix Asphalt	71	2021 HMA-Ovly	20.00	50,371	5-10 Years
3133	White Crescent	McLellan Ave	Pettypiece Dr	Local	Urban	Residential	Hot Mix Asphalt	71	2021 HMA-Ovly	20.00	82,768	5-10 Years
2015	Concession 5 South	Essex County Road 20	South Sideroad	Local	Rural	Residential	Surface Treated	72	2021 Single Surface Treatment (Chip Seal)	5.00	60,958	5-10 Years
1108	Forhan Street	Fort St	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	72	2021 HMA-Ovly	20.00	35,346	5-10 Years
1189	Gore Street	Gore Street	Brock Street	Local	Urban	Residential	Hot Mix Asphalt	72	2021 HMA-Ovly	20.00	14,682	5-10 Years
1083	Laird Avenue South	Maple Avenue	Alma Street	Local	Urban	Residential	Hot Mix Asphalt	72	2021 HMA-Ovly	20.00	96,725	5-10 Years
1117	Pickering Drive	Sandwich Street South	Dalhousie Street	Local	Urban	Residential	Hot Mix Asphalt	72	2021 HMA-Ovly	20.00	80,157	5-10 Years
1106	Ramsay Street	Park Street	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	72	2021 HMA-Ovly	20.00	64,733	5-10 Years
2024	South Sideroad	Concession 4 South	Concession 5 South	Local	Rural	Residential	Surface Treated	72	2021 Double Surface Treatment (Chip Seal)	10.00	85,138	5-10 Years
2057	Meadows Lane	Essex County Road 50	Culdasac	Local	Semi-Urban	Residential	Surface Treated	73	2021 Single Surface Treatment (Chip Seal)	5.00	8,640	5-10 Years
3050	Blue Street	Essex County Road 11 (Walker Road)	Culdasac	Local	Semi-Urban	Commercial	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	27,574	5-10 Years
3008	Concession 3 North	North Sideroad	Middle Sideroad - Anderdon (Essex	Local	Rural	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	312,858	5-10 Years
3011	Concession 6 North	Middle Sideroad - Anderdon (Essex	North Sideroad	Local	Rural	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	303,378	5-10 Years
2066	Lake Erie Drive	Tilford Lane	Mcleod Avenue	Local	Urban	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	18,852	5-10 Years
2155	Meadowview Avenue	Melchoe Rd	Pearson St	Local	Urban	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	67,280	5-10 Years
3129	Pettypiece Dr	Culdasac	Whelan Ave	Local	Urban	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	47,730	5-10 Years
2030	St. Therese Avenue	Essex County Road 20	Woodside Avenue	Local	Urban	Residential	Hot Mix Asphalt	73	2021 HMA-Ovly	20.00	29,016	5-10 Years
3125	Hilton Court	Hilton Crt (West)	Whelan Dr	Local	Urban	Residential	Hot Mix Asphalt	74	2021 HMA-Ovly	20.00	62,352	5-10 Years
1068	St. Arnaud Street	Sandwich Street North	Bertrand Street	Local	Urban	Residential	Hot Mix Asphalt	74	2021 HMA-Ovly	20.00	70,661	5-10 Years
2061	Tilford Lane	Essex Blvd	Concession 3 South	Local	Urban	Residential	Hot Mix Asphalt	74	2021 HMA-Ovly	20.00	37,452	5-10 Years
2068	Claremont Lane	Tilford Lane	Mcleod Avenue	Local	Urban	Residential	Hot Mix Asphalt	75	2021 HMA-Ovly	20.00	19,092	5-10 Years
2051	Concession 5 South	Essex County Road 20	Culdasac	Local	Rural	Residential	Gravel	75	2021 Rehabilitation	10.00	10,850	5-10 Years
2060	Knapps Island Road	Essex County Road 20	Culdasac	Local	Rural	Residential	Gravel	75	2021 Rehabilitation	10.00	18,053	5-10 Years
3142	Lavers Crescent	Patten Cr	Whelan Ave	Local	Urban	Residential	Hot Mix Asphalt	75	2021 HMA-Ovly	20.00	16,847	5-10 Years
3028	North Sideroad	Essex County Road 9 (Howard Avenue	Concession 8	Local	Rural	Residential	Gravel	75	2021 Rehabilitation	10.00	13,770	5-10 Years
3029	North Sideroad	Concession 8	Essex County Road 11 (Walker Road)	Local	Rural	Residential	Gravel	75	2021 Rehabilitation	10.00	13,696	5-10 Years
3035	Texas Road	Essex County Road 9 (Howard Avenue	Concession 8	Local	Rural	Residential	Gravel	75	2021 Rehabilitation	10.00	13,799	5-10 Years
3126	Brown Crescent	Lavers Cr	Welsh Ave	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	73,296	5-10 Years
3127	Canard Blvd	County Rd 10	Annie Ave	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	25,680	5-10 Years
1002	Jones Court	Illinois Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	11,054	5-10 Years
1110	King Street	Gore Street	Simcoe Street	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	32,725	5-10 Years
1030	Pacific Avenue	Simcoe Street	Mediterranean	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	62,746	5-10 Years
1038	Riviera Drive	Boardwalk Avenue	Venetian Drive	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	41,600	5-10 Years
3130	Welsh Avenue	Lavers Cr	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	76	2021 HMA-Ovly	20.00	66,208	5-10 Years
2005	Concession 7	Essex County Road 18 (Pike Road)	Alma Street	Local	Rural	Residential	Surface Treated	77	2021 Single Surface Treatment (Chip Seal)	5.00	38,040	5-10 Years
2002	Concession 4 South	Alma Street	Essex County Road 18 (Pike Road)	Local	Rural	Residential	Surface Treated	77	2021 Full Depth Reclamation (FDR) + Dout	10.00	76,448	5-10 Years
3134	Lavers Crescent	McLellan Ave	End	Local	Urban	Residential	Hot Mix Asphalt	77	2021 HMA-Ovly	20.00	18,128	5-10 Years
3057	North Sideroad	Change in pavement (approx 1/2 len	Concession 2 North	Local	Rural	Residential	Hot Mix Asphalt	77	2021 HMA-Ovly	20.00	144,947	5-10 Years
1161	Ridgeview Place South	Crownridge Boulevard	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	77	2021 HMA-Ovly	20.00	23,400	5-10 Years

3024	North Sideroad	Concession 3 North	Concession 4 North	Local	Rural	Residential	Gravel	85	2021 Rehabilitation	10.00	13,647	Beyond 10 Years
3025	North Sideroad	200m west of Concession 4	Concession 5 North	Local	Rural	Residential	Gravel	85	2021 Rehabilitation	10.00	11,766	Beyond 10 Years
2076	Point Boulevard	McLeod Avenue	Culdasac	Local	Semi-Urban	Residential	Surface Treated	86	2021 Slurry Seal	3.15	9,146	Beyond 10 Years
3014	Concession 4 North	Texas Road	Middle Sideroad - Anderdon (Essex C	Local	Rural	Residential	Hot Mix Asphalt	86	2021 HMA-Slurry	3.15	38,840	Beyond 10 Years
3044	Alma Street	Concession 8	Essex County Road 9 (Howard Avenue)	Local	Rural	Residential	Hot Mix Asphalt	87	2021 HMA-Slurry	3.15	30,929	Beyond 10 Years
1191	Bathurst Street	Richmond Street	Murray Street	Local	Urban	Residential	Hot Mix Asphalt	87	2021 HMA-Slurry	3.15	2,905	Beyond 10 Years
3020	Concession 5 North	Texas Road	Alma Street	Local	Rural	Residential	Hot Mix Asphalt	87	2021 HMA-Slurry	3.15	39,398	Beyond 10 Years
2082	Lake Erie Drive	Tilford Lane	Woodland Lane	Local	Semi-Urban	Residential	Hot Mix Asphalt	87	2021 HMA-Slurry	3.15	3,254	Beyond 10 Years
1060	Victoria Street North	Alma Street	End	Local	Urban	Residential	Hot Mix Asphalt	87	2021 HMA-Slurry	3.15	16,242	Beyond 10 Years
2022	South Sideroad	Creek Road	Concession 4 North	Local	Rural	Residential	Surface Treated	88	2021 Slurry Seal	3.15	21,834	Beyond 10 Years
3045	Alma Street	Essex County Road 11 (Walker Road)	Concession 8	Local	Rural	Residential	Hot Mix Asphalt	88	2021 HMA-Slurry	3.15	31,083	Beyond 10 Years
2007	Meloche Road	Lowes Sideroad	Essex County Road 18	Local	Rural	Residential	Hot Mix Asphalt	88	2021 HMA-Slurry	3.15	29,666	Beyond 10 Years
3108	Texas Road	Knobb Hill Drive	Essex County Road 5	Collector	Semi-Urban	Residential	Hot Mix Asphalt	88	2021 HMA-Slurry	3.15	24,808	Beyond 10 Years
3019	Concession 4 North	Alma Street	Texas Road	Local	Rural	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	38,783	Beyond 10 Years
2023	Creek Road	South Sideroad	Lowes Sideroad	Local	Rural	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	15,455	Beyond 10 Years
1103	Dalhousie Street	Gore Street	Park Street	Local	Urban	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	3,832	Beyond 10 Years
3138	Davis Street	End	Lavers Cr	Local	Urban	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	3,500	Beyond 10 Years
1202	Fraser Ave	Grant Ave	Duff Ave	Local	Urban	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	2,538	Beyond 10 Years
1096	Murray Street	Ramsay Street	Bathurst Street	Local	Urban	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	2,000	Beyond 10 Years
2025	South Sideroad	Concession 5 South	Concession 6 South	Local	Rural	Residential	Surface Treated	89	2021 Slurry Seal	3.15	25,969	Beyond 10 Years
3030	Texas Road	Thomas Road (Essex County Road 5)	Concession 3 North (Fox Road)	Local	Rural	Residential	Hot Mix Asphalt	89	2021 HMA-Slurry	3.15	28,470	Beyond 10 Years
1031	Pacific Avenue	Mediterranean Avenue	Richmond Street	Local	Urban	Residential	Hot Mix Asphalt	90	2021 HMA-Slurry	3.15	6,824	Beyond 10 Years
2078	Malden Colchester South Town	County Rd 50	Beach	Local	Rural	Residential	Surface Treated	91	2021 Slurry Seal	3.15	11,415	Beyond 10 Years
3109	Texas Road	Essex County Road 20	Knobb Hill Drive	Collector	Semi-Urban	Residential	Hot Mix Asphalt	91	2021 Crack Sealing	0.25	1,701	Beyond 10 Years
2013	Creek Road	County Road 20	South Sideroad	Local	Rural	Residential	Hot Mix Asphalt	92	2021 Crack Sealing	0.25	3,702	Beyond 10 Years
1184	Dalhousie Street	Richmond Street	Murray Street	Local	Urban	Commercial	Hot Mix Asphalt	93	2021 Crack Sealing	0.25	210	Beyond 10 Years
1095	Murray Street	Bathurst Street	Sandwich Street South	Local	Urban	Residential	Hot Mix Asphalt	93	2021 Crack Sealing	0.25	151	Beyond 10 Years
2083	Adams Avenue	Shaw Dr	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	98	2021 Crack Sealing	0.25	115	Beyond 10 Years
2079	Shaw Dr	County Rd 20 (West)	County Rd 20 (East)	Local	Urban	Residential	Hot Mix Asphalt	98	2021 Crack Sealing	0.25	773	Beyond 10 Years
1186	Alma Street	Sandwich Street	Culdasac	Local	Urban	Residential	Hot Mix Asphalt	100	2021 Crack Sealing	0.25	402	Beyond 10 Years
3147	Clarke Street	Lundy St	Lambert St	Local	Urban	Residential	Hot Mix Asphalt	100	2021 Crack Sealing	0.25	248	Beyond 10 Years
3150	Erie Isle Court	McLellan Ave	CuldeSac	Local	Urban	Residential	Hot Mix Asphalt	100	2021 Crack Sealing	0.25	126	Beyond 10 Years
3153	Kelly Road	McLellan Ave	Livingstone Cr	Local	Urban	Residential	Hot Mix Asphalt	100	2021 Crack Sealing	0.25	249	Beyond 10 Years
3162	Meadowview Avenue	Richmond St	Meadowview Ave	Local	Urban	Residential	Hot Mix Asphalt	100	2021 Crack Sealing	0.25	185	Beyond 10 Years

Total NOW: \$ 16,061,739.47
Total 1-5 YEAR: \$ 20,314,322.89
Total 5-10 YEAR: \$ 8,630,118.40
Total Beyond 10 YEAR: \$ 608,754.37

APPENDIX G

Treatment List and Description

Treatment Methods				
Treatment	Description	Unit Cost	Inflation Rate	Cost Estimation Year
Paver Interlock-Restore	Paver Interlock Restauration 5% of Surface Area every 9 years	12.50 \$/m²	0.0%	2020
Paver Interlock-Recon	Full Paver Interlock Reconstruction	247.32 \$/m²	0.0%	2020
ST-Slurry	Slurry Seal	3.15 \$/m²	0.0%	2020
ST-SST	Single Surface Treatment (Chip Seal)	5.00 \$/m²	0.0%	2020
ST-DST	Double Surface Treatment (Chip Seal)	10.00 \$/m²	0.0%	2020
ST-FDR & DST	Full Depth Reclamation (FDR) + Double Surface Treatment	13.00 \$/m²	0.0%	2020
HMA-Crack Seal	Crack Sealing	0.25 \$/m²	0.0%	2020
HMA-Slurry	Slurry Seal	3.15 \$/m²	0.0%	2020
HMA-Ovly	One Lift Overlay / Mill and One Lift Overlay	20.00 \$/m²	0.0%	2020
HMA-2Ovly	Two Lift Overlay / Mill and Two Lift Overlay	40.00 \$/m²	0.0%	2020
HMA-FDARR & 2Ovly	Full depth asphalt removal and replacement (Two Lifts HMA)	45.00 \$/m²	0.0%	2020
HMA-FDARR & 3Ovly	Full depth asphalt removal and replacement (Three Lifts HMA)	65.00 \$/m²	0.0%	2020
HMA-Recon 90HMA Rural	Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA) Rural Roads	99.00 \$/m²	0.0%	2020
HMA-Recon 90HMA	Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA) Urban Roads	170.00 \$/m²	0.0%	2020
HMA-Recon 140HMA	Full Depth Reconstruction (350 Gran B, 150 Gran A, 140 HMA)	190.00 \$/m²	0.0%	2020
PCC-FullDepthRepair	Full-Depth Slab Repair/Replacement	130.00 \$/m²	0.0%	2020
Re-Gravelling (50 mm or 2 in)	Re-Gravelling (50 mm or 2 in)	6400.00 \$/Km	0.0%	2020
Re-Gravelling (100 mm or 4 in)	Re-Gravelling (100 mm or 4 in)	8200.00 \$/Km	0.0%	2020
Rehabilitation	Rehabilitation	10000.00 \$/Km	0.0%	2020
Grading	Grading	120.00 \$/Km	0.0%	2020
Drainage Maintenance	Drainage Maintenance	1200.00 \$/Km	0.0%	2020
Dust Control	Dust Control	1000.00 \$/Km	0.0%	2020
Upgrade to ST	Upgrade to ST	31500.00 \$/Km	0.0%	2020
Re-Gravelling HT (100 mm or 4 in)	Re-Gravelling in High Traffic (100 mm or 4 in)	8200.00 \$/Km	0.0%	2020
Rehabilitation HT	Rehabilitation in High Traffic	10000.00 \$/Km	0.0%	2020
Grading-2Times	Grading-2Times	240.00 \$/Km	0.0%	2020
Grading-3Times	Grading-3Times	360.00 \$/Km	0.0%	2020
Grading-4Times	Grading-4Times	480.00 \$/Km	0.0%	2020

HMA (Paved Roads)

HMA-Crack Seal

Crack Sealing

Crack Sealing is the process of placing specialized materials into cracks in unique configurations to keep water and other matter out of the crack and the underlying pavement layers.



Crack Sealing

HMA-Slurry

Slurry Seal

Slurry Seal is mixture of slow setting emulsified asphalt, well graded fine aggregate, mineral filler and water. This treatment is used to fill cracks and seal areas of old pavement, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to improve skid resistance.



Slurry Seal

HMA-ST

Single Surface Treatment (Chip Seal)

Single Surface Treatment (Chip Seal) is a common type of pavement surfacing construction which involves an application of asphalt binder material (bitumen emulsion) and mineral aggregate (gravel). The emulsion is applied by a pressure distributor, followed immediately by an application of mineral aggregate, and finished by rolling.



Surface Treatment (Chip Seal)

HMA-DST

Double Surface Treatment (Chip Seal)

The process for Single Surface Treatment (Chip Seal) is repeated for the second application of emulsion and mineral aggregate (gravel). The first application of aggregate is coarser than the aggregate used in the second application and usually determines the pavement thickness.

HMA-DST SAMI

Double Surface Treatment (Chip Seal) + SAMI

In addition to the Double Surface Treatment, the Stress Absorbing Membrane Interlayer (SAMI) is a geo textile mat that is laid between the surface treatments to strengthen the structure of the road.



SAMI

HMA-EnhSurf

Enhanced Thin Surfacing (Microsurfacing, Thin HMA Overlay)

Microsurfacing is an application of a mixture of polymer-modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed, and spread on a paved surface. Unlike slurry seal, Microsurfacing can be used on high volume roadways to correct wheel path rutting and provide a skid resistant pavement surface.

Thin HMA Overlay is a Hot Mix Asphalt (HMA) overlay of 40 millimeters or less, and is sometimes used when Microsurfacing is not available.



Micro-surfacing

HMA-Enh2Surf

Enhanced Double Thin Surfacing (Double Microsurfacing, Cape Seal)

Double Microsurfacing is an application where the process of Microsurfacing is repeated for a second application.

Cape Seal is an application of a Chip Seal followed by the application of Slurry Seal or Microsurfacing at a later date.

HMA-Ovly

Mill and One Lift Overlay

50mm HMA Overlay with or without milling

HMA-2Ovly

Mill and Two Lift Overlay

2 lift of 50mm HMA Overlay with or without milling

HMA-FDR & 2Ovly

Full Depth Reclamation (FDR) + Two Lift Overlay

Full Depth Reclamation (FDR) is a process where the full pavement section and a pre-determined portion of the underlying materials are uniformly crushed or pulverized. In this treatment this recycled material is then stabilized by mixing it with a recycling agent and other chemical additives. The recycling agent is commonly asphalt-based emulsion or cold-foamed asphalt, or an emulsified engineered recycling agent. The mixture is then spread and compacted to produce a base layer. Two lifts (typically 50mm each) of Hot Mix Asphalt are applied as a surface material, where the second lift is usually a finer grade of Hot Mix.

HMA-FDR & EAS & DST

FDR with Emulsion/Expanded Asphalt Stabilization + Double Surface Treatment

Full Depth Reclamation (FDR) plus a recycle agent and other additives plus a second application of emulsion and mineral aggregate (gravel)

HMA-FDR & EAS & Ovly

FDR with Emulsion/Expanded Asphalt Stabilization + One Lift Overlay

Full Depth Reclamation (FDR) is a process where the full pavement section and a pre-determined portion of the underlying materials are uniformly crushed or pulverized. In this treatment this recycled material is then stabilized by mixing it with a recycling agent and other chemical additives. The recycling agent is commonly asphalt-based emulsion or cold-foamed asphalt, or an emulsified engineered recycling agent. The mixture is then spread and compacted to produce a base layer. A single lift (typically 50mm) of Hot Mix Asphalt is applied as a surface material.

HMA-FDR & EAS & 2Ovly

FDR with Emulsion/Expanded Asphalt Stabilization + Two Lift Overlay

Full Depth Reclamation (FDR) is a process where the full pavement section and a pre-determined portion of the underlying materials are uniformly crushed or pulverized. In this treatment this recycled material is then stabilized by mixing it with a recycling agent and other chemical additives. The recycling agent is commonly asphalt-based emulsion or cold-foamed asphalt, or an emulsified engineered recycling agent. The mixture is then spread and compacted to produce a base layer. Two lifts (typically 50mm each) of Hot Mix Asphalt are applied as a surface material, where the second lift is usually a finer grade of Hot Mix.



Expanded Asphalt Stabilization

HMA-FDARR & 2Ovly

Full depth asphalt removal and replacement (Two Lifts HMA)

This treatment is the complete milling and removal of all asphalt material without recycling, and replacing it with two lifts (typically 50mm each) of Hot Mix Asphalt, where the second lift is usually a finer grade of Hot Mix.

HMA-FDARR & 3Ovly

Full depth asphalt removal and replacement (Three Lifts HMA)

This treatment is the complete milling and removal of all asphalt material without recycling, and replacing it with three lifts (typically 50mm each) of Hot Mix Asphalt, where the final lift is usually a finer grade of Hot Mix.

HMA-Recon 90HMA

Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA)

Full Depth Reconstruction is the excavation and removal of all road materials down to the sub-base or soil, and then reconstructing it with new materials including 350mm of Granular B, 150mm of Granular A and 90mm of Hot Mix Asphalt, typically made up of 2 lifts where the second lift is a finer grade of Hot Mix. This expensive treatment is used as a last resort where a pavement has completely failed and none of the other treatments are determined to provide an adequate solution.

HMA-Recon 140HMA

Full Depth Reconstruction (350 Gran B, 150 Gran A, 140 HMA)

Full Depth Reconstruction is the excavation and removal of all road materials down to the sub-base or soil, and then reconstructing it with new materials including 350mm of Granular B, 150mm of Granular A and 140mm of Hot Mix Asphalt, typically made up of 2 or 3 lifts where the final lift is a finer grade of Hot Mix. This expensive treatment is used as a last resort where a pavement has completely failed and none of the other treatments are determined to provide an adequate solution.

ST (Surface Treated Roads)

ST-Slurry

Slurry Seal

Slurry Seal is mixture of slow setting emulsified asphalt, well graded fine aggregate, mineral filler and water. This treatment is used to fill cracks and seal areas of old pavement, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to improve skid resistance.

ST-SST

Single Surface Treatment (Chip Seal)

Single Surface Treatment (Chip Seal) is a common type of pavement surfacing construction which involves an application of asphalt binder material (bitumen emulsion) and mineral aggregate (gravel). The emulsion is applied by a pressure distributor, followed immediately by an application of mineral aggregate, and finished by rolling.

ST-DST

Double Surface Treatment (Chip Seal)

The process for Single Surface Treatment (Chip Seal) is repeated for the second application of emulsion and mineral aggregate (gravel). The first application of aggregate is coarser than the aggregate used in the second application and usually determines the pavement thickness.

ST-DST SAMI

Double Surface Treatment (Chip Seal) & SAMI

In addition to the Double Surface Treatment, the Stress Absorbing Membrane Interlayer (SAMI) is a geo textile mat that is laid between the surface treatments to strengthen the structure of the road.

ST-EnhSurf

Enhanced Thin Surfacing (Microsurfacing, Thin HMA Overlay)

Microsurfacing is an application of a mixture of polymer-modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed, and spread on a paved surface. Unlike slurry seal, Microsurfacing can be used on high volume roadways to correct wheel path rutting and provide a skid resistant pavement surface.

ST-Enh2Surf

Enhanced Double Thin Surfacing (Double Microsurfacing, Cape Seal)

Double Microsurfacing is an application where the process of Microsurfacing is repeated for a second application.

Cape Seal is an application of a Chip Seal followed by the application of Slurry Seal or Microsurfacing at a later date.

ST-Ovly

Mill and One Lift Overlay

50mm HMA Overlay with or without milling

ST-FDR & DST**Full Depth Reclamation (FDR) + Double Surface Treatment**

Full Depth Reclamation (FDR) plus a recycle agent and other additives plus a second application of emulsion and mineral aggregate (gravel)

ST-FDR & DST & SAMI**Full Depth Reclamation (FDR) + Double Surface Treatment + SAMI**

Full Depth Reclamation (FDR) plus a recycle agent and other additives plus a second application of emulsion and mineral aggregate (gravel), and SAMI

ST-FDR & Ovly**Full Depth Reclamation (FDR) + One lift Overlay**

Full Depth Reclamation (FDR) is a process where the full pavement section and a pre-determined portion of the underlying materials are uniformly crushed or pulverized. In this treatment this recycled material is then stabilized by mixing it with a recycling agent and other chemical additives. The recycling agent is commonly asphalt-based emulsion or cold-foamed asphalt, or an emulsified engineered recycling agent. The mixture is then spread and compacted to produce a base layer. A single lift (typically 50mm) of Hot Mix Asphalt is applied as a surface material.

ST-FDR & 2Ovly**Full Depth Reclamation (FDR) + Two Lift Overlay**

Full Depth Reclamation (FDR) is a process where the full pavement section and a pre-determined portion of the underlying materials are uniformly crushed or pulverized. In this treatment this recycled material is then stabilized by mixing it with a recycling agent and other chemical additives. The recycling agent is commonly asphalt-based emulsion or cold-foamed asphalt, or an emulsified engineered recycling agent. The mixture is then spread and compacted to produce a base layer. Two lifts (typically 50mm each) of Hot Mix Asphalt are applied as a surface material, where the second lift is usually a finer grade of Hot Mix.

ST-FDR & EAS & DST**FDR with Emulsion/Expanded Asphalt Stabilization + Double Surface Treatment**

Full Depth Reclamation (FDR) plus a recycle agent and other additives plus a second application of emulsion and mineral aggregate (gravel)

ST-Recon & Ovly**Full Depth Reconstruction (350 Gran B, 150 Gran A, 90 HMA)**

Full Depth Reconstruction is the excavation and removal of all road materials down to the sub-base or soil, and then reconstructing it with new materials including 350mm of Granular B, 150mm of Granular A and 90mm of Hot Mix Asphalt, typically made up of 2 lifts where the second lift is a finer grade of Hot Mix. This expensive treatment is used as a last resort where a pavement has completely failed and none of the other treatments are determined to provide an adequate solution.

ST-Recon & 2 Ovly**Full Depth Reconstruction (350 Gran B, 150 Gran A, 140 HMA)**

Full Depth Reconstruction is the excavation and removal of all road materials down to the sub-base or soil, and then reconstructing it with new materials including 350mm of Granular B, 150mm of Granular A and 140mm of Hot Mix Asphalt, typically made up of 2 or 3 lifts where the final lift is a finer grade of Hot Mix. This expensive treatment is used as a last resort where a pavement has completely failed and none of the other treatments are determined to provide an adequate solution.

APPENDIX H

Traffic Counts

Request ID	Intersection	Volume Per Direction		Total Volume	Latitude	Longitude
		NB/EB	SB/WB			
01	CR 20 south of Rankin Ave	6879	6973	13852	42.1040136	-83.1097407
02	George St south of Richmond St	142	170	312	42.1035997	-83.10583538
03	Seymour St north of Simcoe St	196	319	515	42.1004474	-83.107037
04	Pickering Dr east of Sandwich St S	1161	1145	2306	42.0973826	-83.1075628
05	Pickering Dr west of Fryer St	838	723	1561	42.097096	-83.09910843
06	Simcoe St west of Fryer St	2305	2469	4774	42.0998106	-83.0991835
07	Victoria St S south of Hamilton Dr	938	1088	2026	42.10664038	-83.10066403
08	Pacific Ave north of Simcoe St	446	398	844	42.1001927	-83.0926389
09	Gibb St east of Fryer St	317	339	656	42.1019669	-83.0977053
10	Richmond St east of Baltic Ave	1190	1232	2422	42.1048963	-83.0965037
11	Richmond St south of Allen Ct	581	609	1190	42.1049281	-83.085949
12	Illinois St north of Richmond St	149	167	316	42.1066156	-83.0875369
13	Kentucky Ave south of Alma St	733	757	1490	42.1099267	-83.0892964
14	Kentucky Ave north of Richmond St	597	603	1200	42.1070295	-83.0899401
15	Indiana Pl south of Richmond St	220	216	436	42.1059151	-83.0905839
16	Balaclava St S north of Fort St	416	476	892	42.1082425	-83.1059611
17	Alma St east of CR 20	2764	2907	5671	42.1108163	-83.1088011
18	Laird Ave S south Alma St	834	839	1673	42.1101477	-83.1122773
19	Venetian Dr south of Alma St	214	244	458	42.1095428	-83.0964093
20	Fryer St north of Fort St	963	1002	1965	42.1095109	-83.0978577
21	CR 20 north of Brunner Ave	5829	5868	11697	42.11907435	-83.11163678
22	CR 20 south of William St	6049	6113	12162	42.1147052	-83.1113363
23	Concession Rd 4 S south Alma St	436	405	841	42.10790158	-83.06602513
24	Texas Rd east of CR 20	1466	1319	2785	42.127611	-83.1133317
25	Knobb Hill Dr north of Texas Rd	1752	1661	3413	42.1284385	-83.1020879
26	Concession Rd 3 N south of Texas Rd	857	1085	1942	42.1247464	-83.0710172
27	Kingsbridge Dr east of CR 20	1251	1342	2593	42.1384317	-83.1147908
28	Park Ln Cir midpoint	42	40	82	42.1456869	-83.1099843
29	CR 10 west of CR 5	1848	1772	3620	42.14328449	-83.08812969
30	CR 10 east of CR 5	2120	1973	4093	42.1431413	-83.0840635
31	Concession Rd 3 N north of CR 10	1207	1523	2730	42.1443505	-83.0697297
32	CR 10 east of Concession Rd 4 N	1785	1787	3572	42.142123	-83.0500745
33	CR 20 south of Emerald Ln	5407	5358	10765	42.15110869	-83.10962655
34	Concession Rd 3 N south of N Side Rd	1220	1544	2764	42.1623253	-83.0684202
35	Concession Rd 3 N north of Beneteau Dr	1792	1983	3775	42.1845017	-83.0671328
36	Fryer St south of Pickering Dr	846	1004	1850	42.0963422	-83.098588
37	CR 20 south McCurdy Dr	4539	4278	8817	42.0941449	-83.1077719
38	Dalhousie St north of Bastien St	582	861	1443	42.0906979	-83.1122351
39	Crownridge Blvd west of CR 20	593	683	1276	42.0902646	-83.1065915
40	Briar Ridge Ave west of Fryer St	254	261	515	42.0936403	-83.0995105
41	Lowes Side Rd west of Meloche Rd	584	696	1280	42.0876531	-83.0841468
42	S Side Rd east of Creek Rd	128	145	273	42.0817324	-83.0784887
43	Concession Rd 4 S north of S Side Rd	342	332	674	42.0824968	-83.0675453
44	CR 20 west of Front Rd S	2172	1982	4154	42.06280374	-83.11406535
45	Concession Rd 3 S north of Tilford Ln	159	178	337	42.04447929	-83.08797718
46	Conceesion Rd 5 N south of CR 8	863	810	1673	42.1839312	-83.0338054
47	CR 9 south of CR 8	4438	4367	8805	42.1824361	-83.0006524
48	Concession Rd 8 south of CR 8	523	461	984	42.1817047	-82.9840819
49	CR 11 south of CR 8	3148	3289	6437	42.18147415	-82.96743075
50	N Side Rd west of CR 11	56	42	98	42.16174232	-82.9732297
51	CR 11 south of Mill St	2817	2782	5599	42.14169074	-82.96998863
52	CR 10 west of CR 11	1062	1169	2231	42.1395348	-82.9726172
53	Concession Rd 8 north of CR 10	487	442	929	42.14151168	-82.98654859
54	CR 9 north of CR 10	3665	3578	7243	42.1416987	-83.0033446
55	Middle Side Rd east of Concession Rd 6 N	1529	1608	3137	42.1409349	-83.0169058
56	Concession Rd 5 north of CR 10	768	732	1500	42.14329766	-83.03635718
57	Concession Rd 5 N south of Texas Rd	653	674	1327	42.1237981	-83.037591

58	CR 9 south of Texas Rd	2911	2812	5723	42.12157	-83.0045462
59	Concession Rd 8 south of Texas Rd	299	317	616	42.1213153	-82.9878092
60	CR 11 south of Alma St	2757	2782	5539	42.1034235	-82.9722739
61	CR 9 south of Alma St	2251	2148	4399	42.1043151	-83.0020571
62	Concession Rd 7 south of Alma St	90	98	188	42.1061618	-83.0180216
63	Concession Rd 6 S south of Alma St	393	300	693	42.1067349	-83.0336428
64	Concession Rd 6 S north of S Side Rd	483	389	872	42.0821316	-83.0354112
65	S Side Rd east of Concession Rd 6 S	49	54	103	42.0797583	-83.0321026
66	Concession Rd 7 north of S Side Rd	99	103	202	42.0801724	-83.0195284
67	Howard Ave north of S Side Rd	1569	1565	3134	42.080024	-83.0035406
68	S Side Rd west of E Malden Rd	42	48	90	42.0778899	-82.9762036
69	E Malden Rd north of Concession Rd 6	571	615	1186	42.07883752	-82.97382174
70	CR 50 south of CR 20	874	937	1811	42.05893867	-83.03677914



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