District of Barriere
REPORT TO COUNCIL
Request for Decision

Date: February 23, 2026	**File:** 530.20/Rpts
To: Council	**From:** Chief Administrative Officer

Re: Early Budget Approval and Loan

Recommendation: 1. **THAT Council provides early budget approval in the amount of up to $150,000 for the Roads Equipment.**   2. **THAT the Council of the District of Barriere authorizes up to $150,000 be borrowed under Section 175 of the Community Charter form the Municipal Finance Authority (MFA), for the purpose of Roads Equipment, AND THAT the loan be repaid within 5 years, with no rights of renewal.**   3. **THAT Council instruct Staff to utilize the General Capital and Fire Capital Reserve accounts to fund the principal portion of the 2025 Bush Truck and the Roads Equipment loans, estimated at a total of $55,069, for the 2026-2030 Financial Plan.**

Purpose

For Council to consider giving early budget and loan approval for up to $150,000 to purchase the equipment necessary to undertake year-round road maintenance services delivered by in-house staff.

Background

In 2025, as part of the Strategic Plan, Council wanted to review a business case on an all year roads department to evaluate if such a model could be used to mitigate cost increases as part of the Fiscally Responsible Operations pillar of the Plan.

Over a span of several months in the summer and fall of 2025, Council extensively deliberated In-Camera about the potential opportunities that would be provided by undertaking all-year roads services in-house compared to the current primarily contractor dependent model for winter roads maintenance.

Council chose to include a transition to an in-house model in the 2026 budget process. Some information was also shared with the public at the Open House that was held on January 27, 2026. The two primary slides from the Open House are attached to this report.

Although the costs to provide a year-round roads department compared to a contractor reliant model are expected to be similar over a 5 year span, the benefit to the District will be in roughly 2,700 hours of labour gained per year, which will be close to $690,000 in value over that same 5-year period.

A primary function of the all-year crew dedicated to roads would also be to focus on much needed crack sealing and pothole patching throughout the community. This in return will prolong the life of our road assets, deferring expensive road rehabilitation work.

The below image further illustrates how highly beneficial it is to focus on investing funds into ongoing maintenance as it has a significant impact on the return on investment. By investing $1 in preventative maintenance such as crack sealing, it eliminates or defers spending $6 to $10 on rehabilitation or reconstruction.
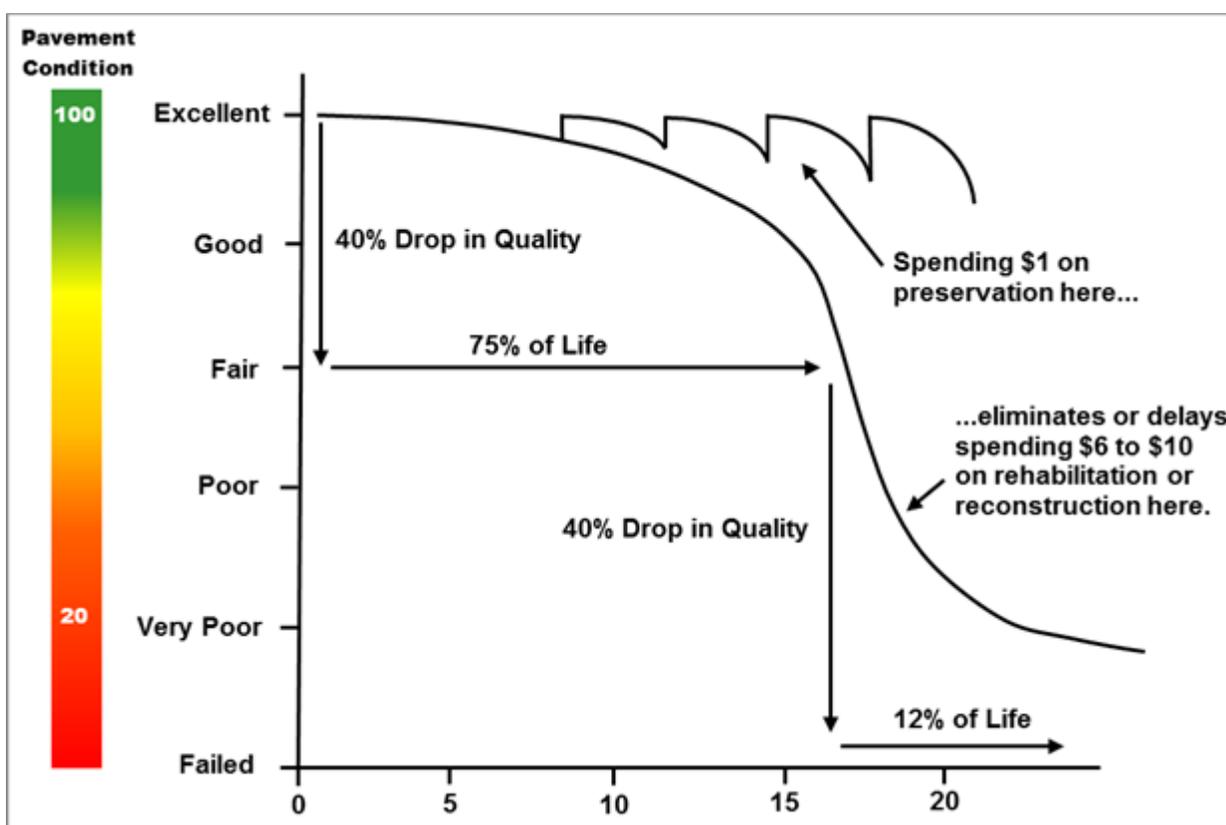
(New York State Thruway System - 2014)

Additionally, The District's Road corridor assessment report that was completed in 2022 shows that the District is supposed to invest $292,000 annually into our roads. (The full assessment report is attached.) The funding level for roads for the past two years has been roughly $100,000 each year. A roads department focused on summer maintenance will have a direct impact on the annual investments into our road assets.

Although there is no monetary increase in the 2026 budget for the labour and materials costs associated with the Roads Department, there is an estimated cost of roughly $150,000 that is required to outfit the department for taking on winter snow removal.

A rough breakdown of the equipment needs is listed below:

Item	Cost
Large Plow Truck w/sander	$50,000
Pickup Truck w/plow & sander	$50,000
Front plow blade & sander for current Dump Truck	$25,000
Sand shed and loading ramp	$32,000
Total	$157,000

This is a high-level cost at this point, and staff are hopeful that some savings can still be achieved when the actual procurement is under way. The best time for acquiring used winter equipment will be in March and April as the winter season comes to a close. With the limited amount of snow in some municipalities, Kelowna for example is already switching into spring maintenance which would indicate that any surplus of equipment sales would be starting earlier than in previous years. And as such, early budget approval would be recommended to ensure the District is in the best position to source the needed items.

Equipment Loan
At the February 2, 2026, Council meeting, Council directed staff to include the funding of the $150,000 required for the Roads Equipment as a loan from MFA instead of funding it from Reserves.

From the February 2, 2026, report:

> *The current interest rate with the Municipal Finance Authority (MFA) is 2.85%. For $150,000 this would equate to roughly $32,224 per year in expenses for 5 years, for a total cost of $161,192 (so, $11,192 in Interest). While the principal portion of the loan could be funded by capital reserve or operating dollars (the asset will be capitalized regardless), the interest portion would need to be funded by operating dollars. For 2026, we estimate a total cost of $24,226 ($3,078 interest included) if we take on the debt around April 1. So, the impact on the reserve for 2026 would roughly be $21,148 instead of the full $150,000 to start the pay back of the loan.*

MFA recently reduced their interest rate to 2.82% which would save roughly $167 over the 5 year term. However, the actual interest rate on the day when the loan is attained will be used. As such, no actual changes are being implemented into the Financial Plan based on this rather minor adjustment.

Summary
The resolutions provided would provide for the following:
1. Early Budget approval of $150,000 for Roads Equipment.
2. MFA loan approval for $150,000 for Roads Equipment.
3. Funding from Reserves for the principal portions of the Bush Truck and Roads Equipment.

Benefits or Impact

General

Establishing an all-year round Roads Department with funding via a MFA loan.

Finances

$150,000 for investment into the District's Roads Department.

$150,000 loan amount with interest to be expected around $11,200 over a 5 year span, at a rate of roughly 2.85%

Utilizing the General Capital reserve for $21,148 in 2026 to cover the principal amount for the Roads Equipment and the Fire Capital reserve for $33,921 for the 2025 Bush Truck principal amount.

Strategic Impact

Goal 2. – Develop a Strategy to mitigate cost increases and downloading pressures.

Action:
   a. Seek opportunities to increase Staff development, capacity, and growth, to align with the current needs of the organization, for example:
        a. Include a full-time roads department in the 2026 draft budget for Council consideration
             i. if approved, complete all required steps to ensure the all-year roads department is operational as soon as possible.

Results we want to see:
   f.   Subject to 2026 budget approval, ensure that the all-year roads department is fully operational by October 2026 for winter operations.

Risk Assessment

Compliance: Financial Plan Bylaw, Community Charter

Risk Impact: Low-Medium – due to committing the District to a 5 year loan. Some costs are still unknown and a follow up request to Council may be needed to utilize reserve funds to cover the difference.

Internal Control Process: Staff is working with MFABC to ensure the correct resolutions are presented for Council consideration.

Next Steps / Communication
-   Initiate procurement process.
-   Complete loan process
-   Hire required staff (up to 2.0FTE) towards the end of August 2026.

Attachments
- Open House Slides – January 27, 2026
- Roads Condition Assessment Report

Recommendation
1. **THAT Council provides early budget approval in the amount of up to $150,000 for the Roads Equipment.**
2. **THAT the Council of the District of Barriere authorizes up to $150,000 be borrowed under Section 175 of the Community Charter form the Municipal Finance Authority (MFA), for the purpose of Roads Equipment, AND THAT the loan be repaid within 5 years, with no rights of renewal.**
3. **THAT Council instruct Staff to utilize the General Capital and Fire Capital Reserve accounts to fund the principal portion of the 2025 Bush Truck and the Roads Equipment loans, estimated at a total of $55,069, for the 2026-2030 Financial Plan.**

Alternative Options
1. Council could choose a different level of funding and a different source of funding.
2. Council could determine to remain with a primarily contractor based model. The budget would require some amendments and generally this will result with reduced funding to go towards a roads program to maintain our assets year-round.

Prepared by:
D. Drexler, Chief Administrative Officer

Proposed
Roads Department

Purpose

To transition winter reliance from external contractors for winter road maintenance to an in-house Roads Department, providing year-round services for both summer and winter road maintenance while delivering more flexible services to the community.

Current Model (Contracted)	Proposed In-House Model
Winter Snow Clearing – External Contractor Winter Roads Maintenance Only	Two Additional Full-time Employees for Both Winter and Summer Maintenance
Seasonal Service (Fixed)	Year-round Service, (Flexible)
Limited Flexibility for Repairs	More Staff Time for Asset Maintenance
Less Capacity for Emergencies	Faster Response to Urgent Issues
Unpredictable Cost Increases	More Predictable Long-term Costs

Comparison

Contractor Model	Proposed In-House Model
Estimated 5-Year Operating Cost - $2.58 million	Estimated 5-Year Operating Cost - $2.53 million
Service Period – Winter Only (6 months per year)	Service Period – Year round
Crews are paid to be available, even when no snow is falling	Staff will shift between winter and summer work as needed

Initial Investment Required
$100K-$150K (used equipment)

. **Contractor Model**: Higher long-term costs due to uncertain price increases and lack of staff flexibility for other tasks.

. **In-House Model**: Provides cost predictability, operational efficiencies, and additional staff time for critical maintenance tasks in the winter and roads asset maintenance in the summer (crack sealing, pothole patching, etc.) to extend the life of the roads before major rehabilitation.

grow with us

THE DISTRICT OF
BARRIERE

Benefits

Cost Stability: Reduces financial risks associated with unpredictable contractor price increases.

Efficiency Gains: Additional 2,700 hours of staff time can be used for critical tasks like pothole patching, crack sealing, drainage maintenance, infrastructure upkeep, and support for other departments as needed.

Long-Term Savings: Proactive maintenance can extend road life, reducing future rehabilitation costs significantly.
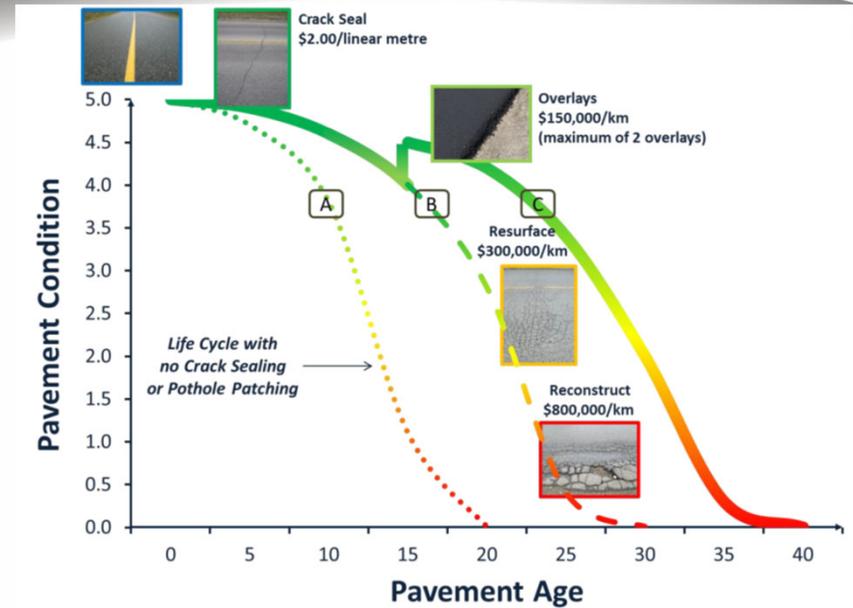
Community Benefits: Increased visibility, accountability, and stable local employment opportunities.

Emergency Response: Availability of staff for urgent situations like clearing downed trees after storms.
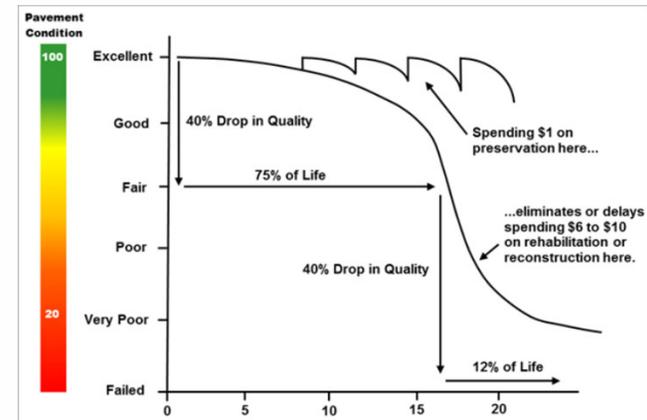

Above: Graph/visual from 2014 Lake Country Roads department report

Type	Treatment	Unit Cost
Preventive Maintenance	Crack Sealing	$3.0/L-m
Reactive Maintenance	Shallow Patching	$60/m²
Resurfacing	Overlay (nominal 50 mm)	$25/m² + (Crack Area Patching Cost*)
	Mill & Inlay (nominal 50 mm)	$32/m² + (Crack Area Patching Cost*)
	Mill & Inlay (nominal 75 mm)	$40/m² + (Crack Area Patching Cost *)
Major Rehabilitation	Full Depth Reclamation	$50/m²
	Reconstruction	Local Road: $150/m² Collector Road: $165/m²

* Crack Area Patching Cost = $70/m² * AFCA, where AFCA = all fatigue crack (%)

The above table highlights 2022 costs from the Road Condition Assessment Report

Above: Graph/visual from an Asset Management online source

District of Barriere 2022 Roadway Data Collection and Pavement Management Plan
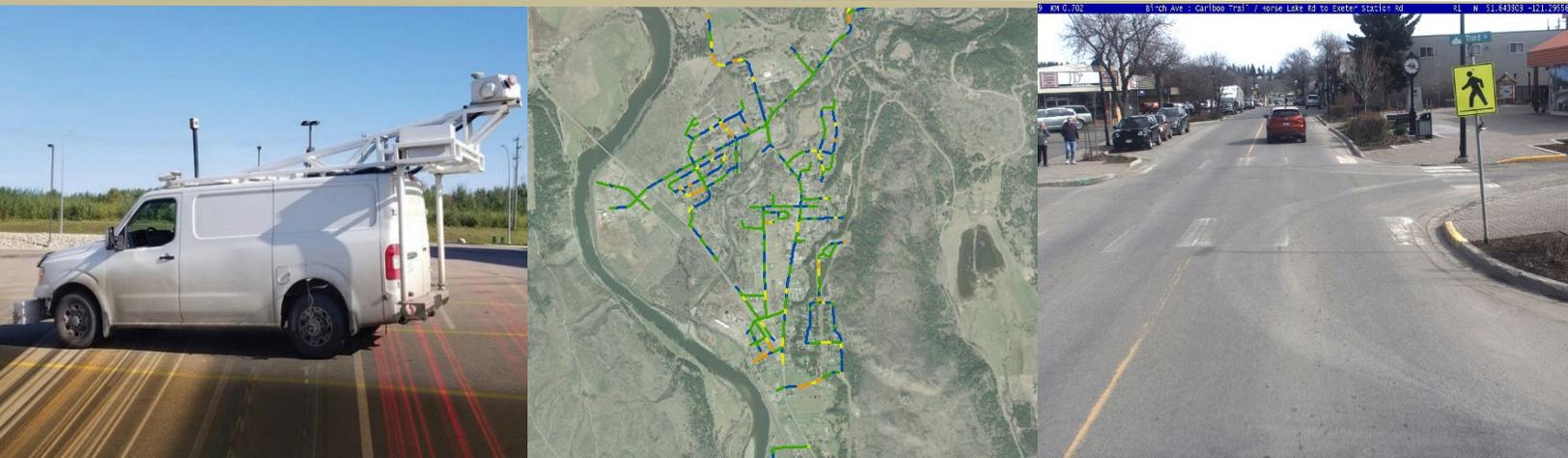
PRESENTED TO
TRUE Consulting

SEPTEMBER 12, 2022
ISSUED FOR USE
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LIMITATIONS OF REPORT

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TETRA TECH

1.0 INTRODUCTION

1.1 General

Tetra Tech Canada Inc. (Tetra Tech) was retained by TRUE Consulting (TRUE) to collect pavement condition data for the District of Barriere (the District) and develop multi-year capital planning based on a Pavement Management System (PMS) analysis.

This report documents the methodology followed to collect and analyze the pavement data, reports the existing network pavement condition, conduct a life-cycle-cost analysis of all pavement asset and develops a capital rehabilitation work plan based on the 2022 pavement condition and the District's current funding level.

All data and results have been linked to an ESRI based GIS and are transmitted to TRUE in digital form as part of the reporting task for this project.

1.2 Project Definition

The District's roadway network consists of approximately 27.7 centerline-km of paved road including 3.9 centerline-km of Collector Road and 23.8 centerline-km of Local Road. Table 1 with a breakdown of the pavement data collection activities.

Table 1: Roadway Data Collection

Road Classification	Centreline Length (km)	Pavement Distress	Roughness (IRI)	Rut Depth	Roadway Imagery	LCMS Imagery
Collector	3.9	✓	✓	✓	✓	✓
Local	23.8	✓	✓*	✓	✓	✓

* Where survey speeds of at least 25 km/h could be met. Slower data collection speed generally occurs at the start and end of roads and where the driver decides that a faster speed is not safe.

1.3 TRUE Provided Information

The TRUE provided the following datasets to be incorporated into the 2022 PMS development:

- GIS shapefile of road centerlines;

- Roadway classification; and

- Unit costs for a list of typical treatment types.

2.0 NETWORK DEFINITION BASED ON LINEAR REFERENCING

Tetra Tech considers correctly referenced data to be one of the most important aspects of pavement data management. Location referencing is the method whereby the pavement distress, historical data, and road attribute data are referenced to the basic road inventory.

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The linear referencing used a standardized methodology (based on PolylineM) for the pavement segments in a Geographic Information System (GIS). These polylines called "Routes", allow data defined by a linear distance from the origin of the line to be linked to the correct location along the polyline (Figure 1). Tetra Tech reviewed the roadway centerline layer provided by TRUE and found the network definition to be complete and accurate for defining the data collection and pavement management analysis.

The list of roads for data collection was developed in conjunction with the District. This list became the data collection "Master List" used for all field activities, including the necessary location descriptions and lengths so that the collection would be as complete and accurate as possible. The process defined a data collection direction for each roadway in the District's network so that future data collection

Figure 1 - Example of the District Routes in GIS

can use the same directionality where possible can be accurately compared. The Master List was also used in field quality control as the base layer for the "TT Surveyor" application. TT Surveyor graphically displays the status and logs the completion of each segment during collection along with any relevant field notes during the data collection program.

3.0 PAVEMENT DATA COLLECTION

3.1 Field Pavement Data Assessment

Georeferenced pavement condition assessments were conducted with one of Tetra Tech's Pavement Surface Profiler (PSP-7000) vehicles. The PSP was used to collect automated pavement surface distresses, International Roughness Index (IRI), and digital image logs for the roadways.

Tetra Tech collected the pavement condition data on 27.7 lane-km of the District's paved road network in May 2022. The survey was generally conducted in the northbound or eastbound lanes of each road segment.

Figure 2 - Tetra Tech's PSP-7000 Vehicle

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3.1.1 Pavement Surface Distress

Tetra Tech performed automated surface condition measurements with a 3D Laser Crack Measurement System (LCMS). The LCMS produces detailed 3D elevation maps of the pavement surface, which are used to automatically detect and classify surface distresses. The system detects and classifies cracks based on pavement surface elevation changes and differences in surface colour. The elevation data is automatically processed to generate severity and extent measures for cracks and other roadway distress types (Figure 3).

| 3D Elevation Data | Automated Crack Detection Overlay (Colourized Severity) | Intensity Data |
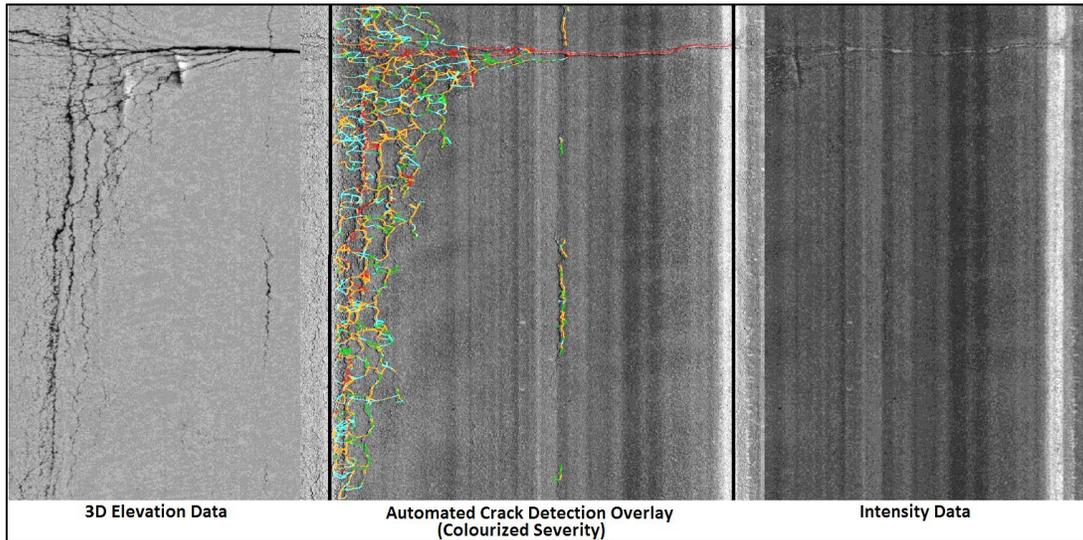
Figure 3 – Example Automated Distress Detection using LCMS

Distress data on all paved roads was consistent with ASTM D6433 methodology, whereby individual distresses are rated based on severity and extent. Surface distresses were inventoried for the width of the surveyed lane. The data was provided at a maximum interval of 50 m.

For this assignment, the recorded distresses included:

- Alligator Cracking (including longitudinal fatigue cracking)

- Longitudinal Cracking (excluding fatigue cracking)

- Transverse Cracking

- Weathering

- Raveling

- Potholes

- Rutting

Cracking associated with patching (within patches or around patches) is similarly captured by the LCMS, as cracking. Therefore, patching and utility cuts were not rated as a separate distress.
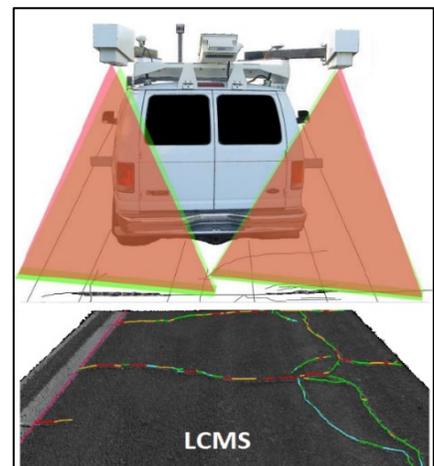
Figure 4 - Representation of the LCMS

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3.1.2   Front and Top Down Digital Images

Digital images were collected for all PSP surveys using an integrated Digital Imaging System. This system provides a forward looking, right-of-way (ROW) full roadway view (the digital image spans from left side ROW to right side ROW). The imaging system provides a fully referenced record of the roadway corridor at the time of survey for the identification, inventory, and referencing of all infrastructure and appurtenances located within the driven ROW. Images are organized in folders for each roadway and delivered at a nominal spacing of 6 m. The direct linking of the ROW images into the project GIS was used as a data quality assurance tool. It provides users the ability to "virtually drive down the street" while sitting at their desk and was used in the validation of the condition data and analysis results.

In addition, the LCMS includes a high-resolution 2D imaging system with optics designed to increase the contrast and visibility of both small longitudinal and transverse cracks in roadways. Through precise laser and camera synchronization, it can capture high-resolution images of surfaces (Top Down) while travelling at normal traffic speeds. Figure 5 shows an example of PSP-7000 digital front and top down imagery.

Figure 5 - Example of PSP-7000 Digital Image Log (Front & Top Down) – Mountain Rd.

3.1.3   Pavement Roughness (IRI) and Rut Depth

The PSP-7000 vehicle's roughness measurement capabilities are provided by an inertial profiling system, which is a FHWA Class II profiler and ASTM E950, AASHTO M328-10 and AASHTO PP70-10 compliant. Roughness data was collected and processed to provide International Roughness Index (IRI) using a high precision laser sensor array and two-wheel path accelerometers. Data collection and processing for this project was conducted in conformance with the "Best Practice Guidelines", as described in the Transportation Association of Canada document "Standardization of IRI Data Collection and Reporting in Canada."

The roughness data was provided for all segments where the data collection platform was able to record valid roughness data. The system requires survey speeds greater than 25 km/h for valid IRI measurements. Invalid IRI data will be shown as blank and marked as "Under Speed Threshold (UST)" in the sample data spreadsheet.

Transverse profile rut measurements were collected using the LCMS. Rut depths are calculated for the left and right wheelpath using, depending on lane width, 3,000 to 4,000 relative height measurements across the survey lane.

IRI and Rut depth data was provided at maximum intervals of 50 m.

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4.0   PAVEMENT CONDITION INDICES

A pavement condition index is a value which expresses the overall condition of a pavement by considering various factors such as surface distresses, structural defects, and ride quality. The selection of an appropriate pavement condition index depends on the objectives of whatever system is used to manage a particular pavement network. The following indices were used for this project:

- Pavement damaged surface area indices, for performance modelling and treatment selection.

- Pavement Condition Index (PCI) according to ASTM D6433 to report the overall pavement condition at the network level and useful for comparison to other municipalities.

- Pavement surface ruts depth (RUT); excessive rutting can pose a safety concern in wet weather on higher traffic speed roadways.

- Pavement Roughness (IRI) to quantify riding comfort and compare to historical condition.

4.1   Pavement Damaged Surface Area Indices

The individual pavement surface distresses are an important element of pavement management. They are of particular use in the treatment selection process. Tetra Tech uses the individual pavement surface distress indices as defined by the World Bank's Highway Development and Management Road Deterioration and Works Effects (HDM - RDWE) models.

The pavement cracking is classified into two categories: structural cracking and non-structural cracking. Each of these two categories of cracking are divided into a low and a high severity. The structural and age-related cracks are included in the fatigue crack index which is defined as the percent of the pavement surface area with load and age-related fatigue cracks including: alligator cracking and wheelpath longitudinal cracking. It is modelled as:

- AFCL (%):   Narrow Fatigue Cracking Area;

- AFCW (%):   Wide Fatigue Cracking Area; and

- AFCA (%):   All Fatigue Cracking Area (AFCL+ AFCW).

The non-structural cracks are included in a thermal crack index which is defined as the percent of pavement surface area with cracks that are induced by low temperature as well as other non-structural cracking. The index includes transverse cracking and non-wheelpath longitudinal cracking such as joint cracking. It is defined as:

- TCL (%):   Narrow Thermal and Other Cracking Area;

- TCW (%):   Wide Thermal and Other Cracking Area; and

- TCA (%):   All Thermal and Other Cracking Area (TCL + TCW).

The ACA Index is defined as total area of cracking including all fatigue cracks and thermal cracks:

- ACA (%) =   AFCA + TCA.

These Cracking Indices are usually easily understood by the general public and municipal council because they represent what is visible on the road irrespective of the cause of the cracking. The fatigue cracking is very important and has the largest impact on maintenance and rehabilitation costs. It is often caused by traffic loading and indicates where pavements may need strengthening, deeper patching repairs, or even replacement. Thermal and most other

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cracks are less of a concern; however, when unsealed they can allow moisture to enter the roadbed and ultimately lead to loss of strength.

Raveling is the dislodging of coarse aggregate particles. Raveling may be caused by insufficient asphalt binder, poor mixture quality, insufficient compaction, segregation, or stripping. Weathering is the wearing away of the asphalt binder and fine aggregate matrix primarily through oxidization of the bitumen due to age and environment. Since 2009, ASTM has treated these two distresses separately because the mechanism causing these distresses is different. They have, therefore, been recorded separately in this report:

- WRL (%):   Low severity Weathering Area;

- WRH (%):   Moderate to High severity Weathering Area; and

- RVH (%):   Moderate to High severity Raveling Area.

4.2   Pavement Condition Index (PCI)

The PCI is a standard index commonly used in North America. It is therefore useful for comparing the overall condition of one agency's network to other agencies. It expresses the condition of the pavement surface as a function of the severity and extent of the visible surface distresses. The PCI is a numerical rating that ranges from 100 to 0 with 100 as the best possible condition and 0 as the worst possible condition. The PCI is determined using the methodology documented in the American Society for Testing and Materials standard ASTM-D6433.

4.3   Pavement Rutting

The pavement surface ruts can pose safety concerns where they are deep enough to affect the handling characteristics of a vehicle at higher speeds and can affect the ability of an agency to effectively clear snow and ice in the winter. The rut depth is measured in millimetres and the average of the inner and outer wheelpath rut depths has been used for the condition report and pavement performance modelling.

4.4   Pavement Roughness

Pavement roughness is a measure of the irregularities in the surface of a pavement that adversely affect the ride quality from a vehicle or user standpoint. The roughness is attributed to deviations of the surface from a true plane with characteristic dimensions that affect vehicle dynamics, ride quality, dynamic loads and drainage, expressed as the International Roughness Index (IRI). The IRI is calculated from a measured longitudinal profile as the vertical suspension motion divided by distance travelled of a quarter-car model. It is reported in millimetres per metre (mm/m) or equivalently metres per kilometre (m/km).

Since its introduction in 1986, IRI has become the road roughness index most commonly used worldwide for evaluating and managing higher speed road systems. Vehicle operating costs including fuel consumption, tire wear, and depreciation rise with increasing roughness and have been correlated to IRI. Even on a lower speed municipal network, due to the high repeatability of IRI measurements, it is also a good indicator of overall network health for comparison to a future year's pavement condition survey.

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5.0 POPULATE DATABASE AND PAVEMENT CURRENT CONDITION

The condition indices of each 50 m sample unit, the roadside inventory data and other important information were transformed and consolidated into analysis segments using the dynamic data transfer functions within the analysis software. The analysis segments are generally block-to-block segments that are used to aggregate raw data into longer management segments that will become the basis for rehabilitation projects.

5.1 2022 Paved Road Condition

As described in Section 4, PCI, damaged surface area indices, Rut and IRI are used to report pavement condition status. The current status is based on the average values within each pavement management segment and weighted by centreline length. Table 2 provides a breakdown of the average pavement condition in 2022 for the District's roadway network. Detailed tabular data of 2022 pavement condition indices are presented in Appendix B.

Table 2: Average 2022 Pavement Condition

Road Class	Length (km)	Fatigue Crack (AFCA, %)	Thermal and Other Crack (TCA, %)	Total Cracking (ACA, %)	PCI	RUT (mm)	IRI (mm/m)
Local	23.8	2.2	5.3	7.5	71	3.9	3.76
Collector	3.9	1.8	6.3	8.1	80	4.0	1.94
Total	27.7	2.1	5.4	7.5	72	3.9	3.50

As can be seen in Table 2, the District has approximately 2% of fatigue cracking on both collector and local road network. However, it appears that the network has over 5.0% in average of thermal and other cracks, these cracks are mostly due to low temperature or reflective cracks from an underlaying layer. Figure 6 shows an example of extensive thermal and other crack on Robin Dr.

Figure 6 – Low Severity of Thermal and other Crack - Segment located on Robin Dr.

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Pavement condition represented by PCI, ACA, and IRI can be classified into five categories as good, satisfactory, fair, poor or very poor. Table 3 provides the range of values used for each condition description. The maps displaying the 2022 PCI and AFCA are presented in Appendix B.

Table 3: Index Ranges for Condition Description

Rating	PCI[1] (%)	Cracking Index (ACA %)	IRI (mm/m)[2]		Colour Code
			COL	LOC	
Good	85 – 100	0 – 1	< 2.28	< 2.86	
Satisfactory	70 – 85	1 – 5	2.28 – 3.59	2.86 – 4.49	
Fair	55 – 70	5 – 10	3.59 – 4.54	4.49 – 5.69	
Poor	40 – 55	10 – 30	4.54 – 6.25	5.59 – 8.08	
Very Poor	0 – 40	30 – 100	> 6.25	> 8.08	

1. The PCI is based on ASTM D6433
2. The IRI condition range is based on (Yu, Chou, & Yau, 2006), normal travel speed of 50 km/h for COL and 40 km/h for LOC.

The distribution of PCI values for the network and for each roadway classification are shown in Figure 7. The road segments in poor to very poor condition are defined as "backlog roads". The figure indicates that the District currently has 19.1% of its pavements, or approximately 5.3 centerline km of roadway in backlog with PCI< 55 in 2022.

Figure 7 - 2022 Pavement Condition Distribution in Terms of PCI

The distribution of ACA values for the network and for each roadway classification is shown on Figure 8. The figure indicates that the District has 23% of the network in poor condition in 2022.
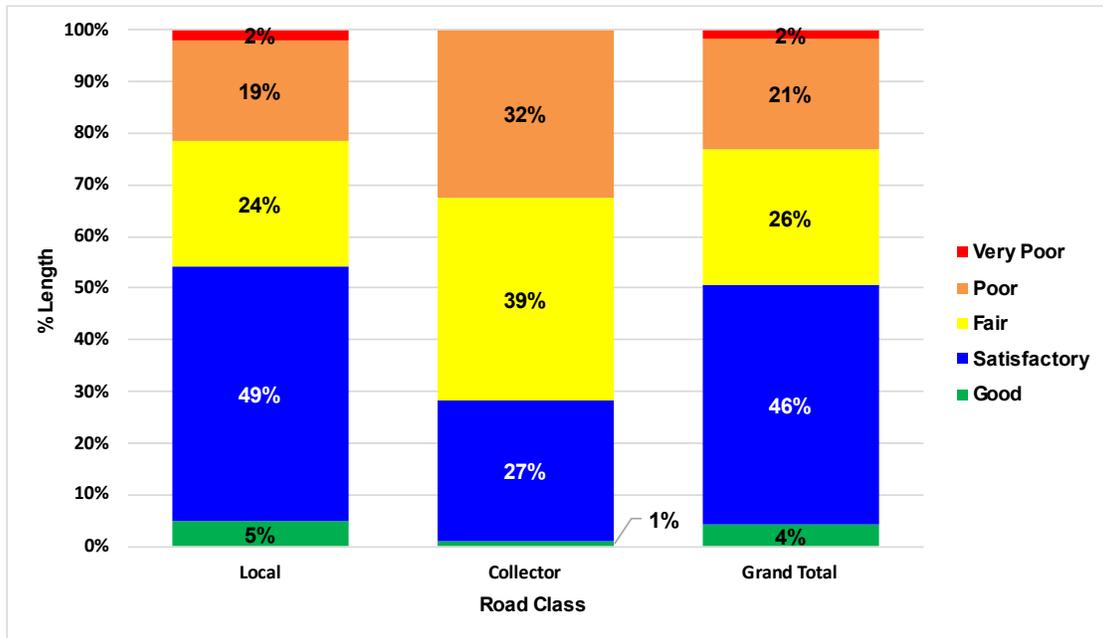
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Figure 8 - 2022 Pavement Condition Distribution in Terms of ACA

6.0   ANALYSIS METHODOLOGY

6.1   Pavement Performance Modelling

Tetra Tech used the World Bank's Highway Development and Management (HDM) modelling framework that has been developed and updated by a worldwide team of experts over more than 20 years. These models, when locally calibrated, can predict the propagation of individual distresses such as cracking indices (AFCL, AFCW, TCL and TCW), rutting, and roughness. Figure 9 illustrates the progression of these models from required inputs through to predicted condition. Tetra Tech have been calibrating these models in the western Canada since the late 1990s.
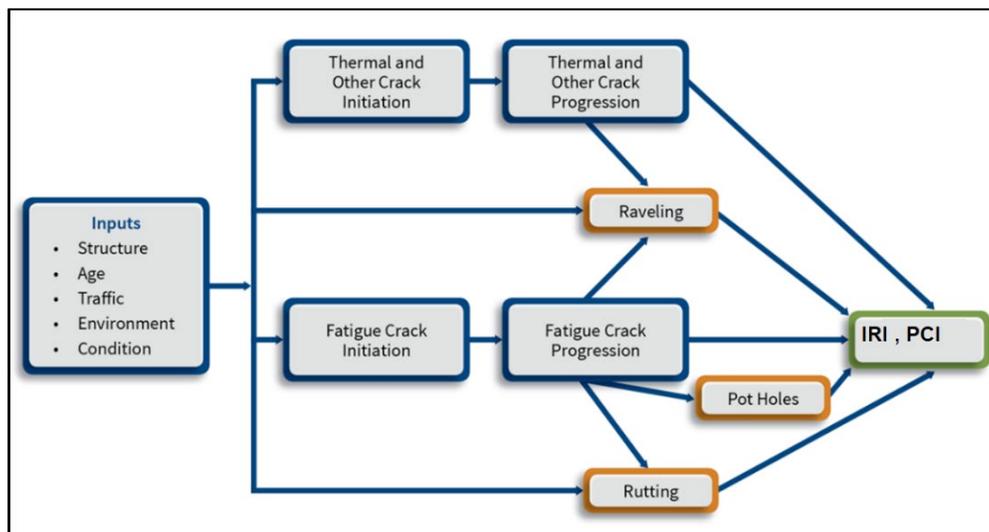
Figure 9 - Predicting Pavement Performance

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This enables systems using these models to select appropriate treatments, and to accurately assess current condition and value.

The modelling of severity and type of cracking enables true life cycle cost analysis because the cost of maintenance and rehabilitation treatments is highly dependent on the extent of cracking to be repaired. If cracking is left unrepaired maintenance costs increase, most noticeably in the form of pothole patching. This enables systems using these models to select appropriate treatments, and to accurately assess current condition and value.

Pavement condition forecasts are based on models developed and used for other municipalities in the southern interior of BC. They are based on typical climatic conditions and exclude extreme climatic events.

6.2   Rehabilitation and Maintenance Treatments

Maintenance and rehabilitation treatments used were established and confirmed with TRUE's input. The treatments and their unit costs are shown in Table 4. Typically, crack sealing and surface patching are considered maintenance treatments and the other treatments are considered resurfacing/major rehabilitation treatments.

Table 4: Treatments and Unit Costs used in the Analysis

Type	Treatment	Unit Cost
Preventive Maintenance	Crack Sealing	$3.0/L-m
Reactive Maintenance	Shallow Patching	$60/m²
Resurfacing	Overlay (nominal 50 mm)	$25/m² + (Crack Area Patching Cost*)
	Mill & Inlay (nominal 50 mm)	$32/m² + (Crack Area Patching Cost*)
	Mill & Inlay (nominal 75 mm)	$40/m² + (Crack Area Patching Cost *)
Major Rehabilitation	Full Depth Reclamation	$50/m²
	Reconstruction	Local Road: $150/m² Collector Road: $165/m²
* Crack Area Patching Cost = $70/m² * AFCA, where AFCA = all fatigue crack (%)		

6.2.1 Treatment Triggers

The feasibility of applying a treatment on a given analysis segment is usually limited by physical or other constraints. For example, thick overlays cannot be directly applied to segments with curb and gutter. Similarly, a treatment should never be applied in the absence of any surface distress and an overlay should not be considered if the pavement is too severely distressed. A set of "triggers", shown in Table 5, were developed so that only feasible treatments are explored.

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Table 5: Maintenance and Rehabilitation Triggers

Type	Curb Existence	Trigger Criteria	Variable
Crack Sealing	-	AFCL >1% or TCL > 1%	AFCL: Narrow fatigue crack (%) AFCW: Wide fatigue cracking (%) AFCA: All fatigue cracking (%)
Shallow Patching	-	AFCW >1% or TCW > 2% or Pothole	
Overlay (50 mm)	No	**Local:** (10%< AFCA <25% Or PCI < 55) **Collector:** (8%< AFCA <25% Or PCI < 60)	
Mill &Inlay (50 mm)	Yes	**Local** And (10%< AFCA<25% Or PCI < 55)	TCL: Narrow thermal cracking (%) TCW: Wide thermal cracking (%)
Mill &Inlay (75 mm)	Yes	**Collector** And (10%< AFCA <25% Or PCI < 60)	
Full Depth Reclamation	No	AFCA ≥ 25%	PCI: Pavement Condition Index
Reconstruction	Yes		

6.2.2 Treatment Resets

With the selection and application of any given rehabilitation treatment, the condition of a road will improve. For example, with the treatment of 50 mm overlay, ruts would be filled, cracking would be overlaid with localized repair of fatigue cracks, roughness would decrease, and strength would increase. Therefore, to predict performance over time and account for and compare possible interventions, the performance models must adjust the measured and forecast distress data to reflect the application of the treatment. These changes to the value of the analysis variables as a result of the application of a treatment are called resets. Some substantial rehabilitation treatments, such as reconstruction, might reset virtually all the analysis variables.

6.3   Life Cycle Cost Analysis

The objective of pavement management is to provide and preserve the network of pavements as economically as possible (lowest life cycle cost). Tetra Tech used Deighton's Total Infrastructure Management System (dTIMS), that is programmed by Tetra Tech engineers to perform Life Cycle Cost Analysis (LCCA). There are usually several alternative strategies for preserving a given pavement segment. Each alternative strategy includes one or more treatment options. Each alternative strategy is also associated with different routine maintenance and operating costs. Figure 10 illustrates three example strategies:
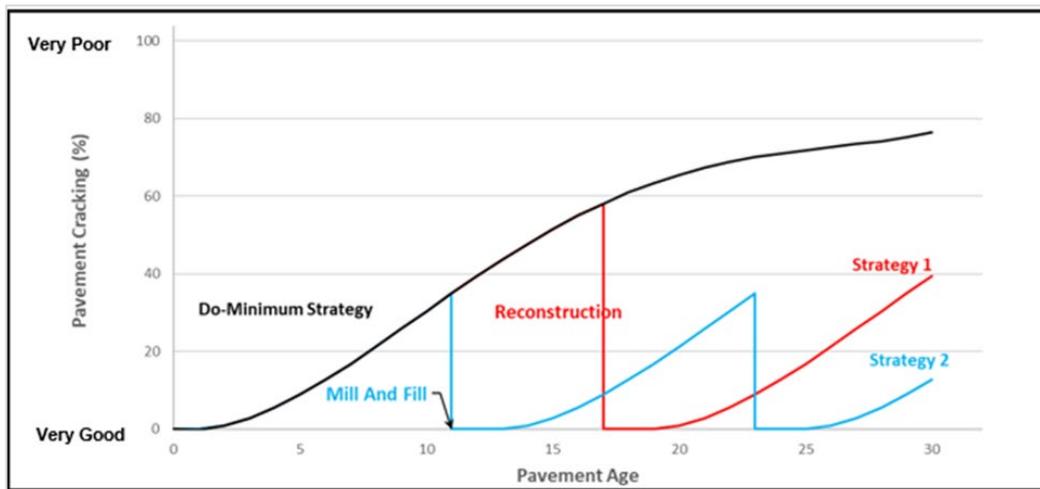
Figure 10 - Life Cycle Cost Analysis Example

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- The Do-Minimum strategy (base case strategy);

- Strategy 1 – Comprises a Reconstruction; and

- Strategy 2 – Comprises two Mill and Fill treatments.

The do-minimum strategy will result in no capital/ rehabilitation costs but extremely high reactive maintenance and operating costs. It will also have associated with it a large rehabilitation "debt". Strategy 1 will have a higher initial treatment cost than Strategy 2; however, Strategy 2 involves two lower cost treatments spread over a period of several years. For a given road, it is not immediately obvious which strategy or even which year of strategy initiation results in the lowest possible operating and maintenance cost. Indeed, for a network it is generally not possible to pick the best option for each road segment as that may exceed the available funding in one or more years.

In this study several initial rehabilitation treatments such as mill/fill, full depth reclamation, and reconstruction are considered. However, the timing of the initiation of a rehabilitation treatment is also variable. There is a window of opportunity to apply an overlay that spans several years. The amount of cracking and pavement failure that must be deep patched prior to application of the overlay increases in each year so the overall cost of the overlay increases each year. The analysis is further complicated by the fact that subsequent treatments can also be applied over a span of several years. In fact, for a given road segment there are potentially hundreds of feasible strategies, each with its own stream of predicted pavement conditions, (as defined by the models and the resets), its own stream of rehabilitation and maintenance costs and its own stream of benefits. Without a definition of "Cost and Benefit" it is not immediately obvious which strategy or even which year of strategy initiation results in the most cost-effective strategy.

The overall cost of rehabilitation treatments, routine maintenance and operating costs required to preserve the pavement under a given strategy scenario is called the Life Cycle Cost (LCC) of the strategy. In general, the LCC of a pavement is defined as the total cost over the analysis period expressed in terms of today's cost i.e. Present Value (PV). The total costs include four parameters:

$$LCC_{pv} = CC + (R+M)C_{pv}$$

Where:

LCCpv	Present Value of all Life Cycle Costs
CC	Initial construction costs of the pavement structure
(R+M)Cpv	Present value of the sum of all rehabilitation and maintenance costs over the analysis period

Note however, when planning preservation, the original pavement structure already exists. Therefore, the initial construction cost term, CC, does not apply. It is assumed that each paved road would remain beyond any analysis period, therefore, salvage cost has not been considered.

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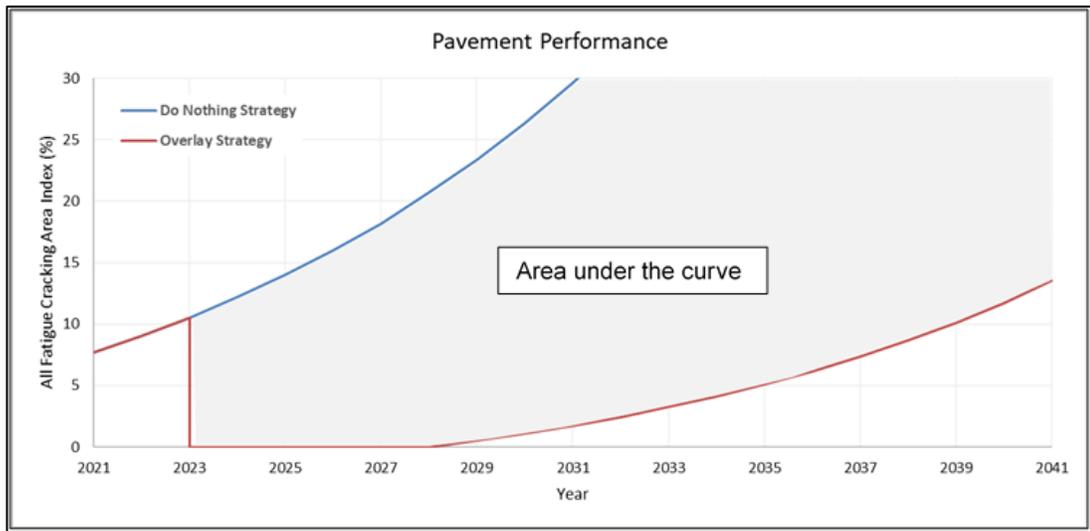
Figure 11 - Example of Calculating the Benefit for an Overlay Strategy

6.3.1 Method to Measure Benefit

One method to derive the benefit is to multiply the area under the pavement performance curve by the length of the pavement segment (so that longer segments with higher cost also have higher benefit). The Area under the Curve was calculated by summing the present value of the difference between the condition index (such as damaged surface area index) resulting from a strategy and the condition index for the do-nothing strategy (base case strategy) for each year in the analysis period. A strategy is a collection of treatments over time that addresses the deficiency of the road segment. Figure 11 shows an example of calculating the benefit for a strategy with one overlay, early in the 20-year analysis period.

Up to this step, all things being equal, a local road with the same amount of cracking area would rank equally with a collector road. The collector road would have more traffic and should be a clear priority since there are insufficient funds to address all roads in the network at once. Therefore, a user priority factor is required to be combined with pavement condition data.

Table 6 shows user priority factors developed based on road classification and route type.

Table 6: User Priority Factor

Road Class/ Route type	User Priority Factor
Collector Road	2
Local Road	1

To sum up, the benefit was defined combining both condition and user factor, as shown in the following formula:

$$Benefit = \textbf{Present Value of Area under Pavement Performace Curve} \ \times \ \textbf{User Priority Factor}$$

6.3.2 Budget Scenarios

In order to assist the District with its decision-making process, the following funding levels (Table 7) were modelled from 2023 to 2042.

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Table 7: Capital Budget Scenarios for Pavement Rehabilitation (2023 - 2042)

Budget Scenario	Annual Capital Budget
1	Maintenance Only
2	$150,000
3	$200,000
4	$250,000
5	Unconstrained Budget (Needs Assessment)

These funding scenarios are expressed in **2022 dollars**. It is noted that routine maintenance (Crack Seal and Patching) costs are part of a separate operations budget and therefore do not use the available capital budgets.

7.0   ANALYSIS RESULTS

7.1   Needs Assessment (Unconstrained Budget Analysis)

An unconstrained budget, also called a needs-based budget, represents the funding stream for the theoretical scenario where funding could be provided for each road segment in the first year that a rehabilitation trigger is reached. This is not intended to be a practical scenario. However, it will demonstrate the maximum amount of work that could be done based on the condition data and treatment triggers. Figure 12 summarizes the rehabilitation costs based on the unconstrained budget scenario. Under this theoretical scenario, the District would require around $1.47 million in the first year for rehabilitation and roadway maintenance of the roadway network. In total, $5.83 million ($292,000 per year) will be required for pavement rehabilitation and roadway maintenance over a 20-year period to address all of the triggered needs at the earliest possible time.
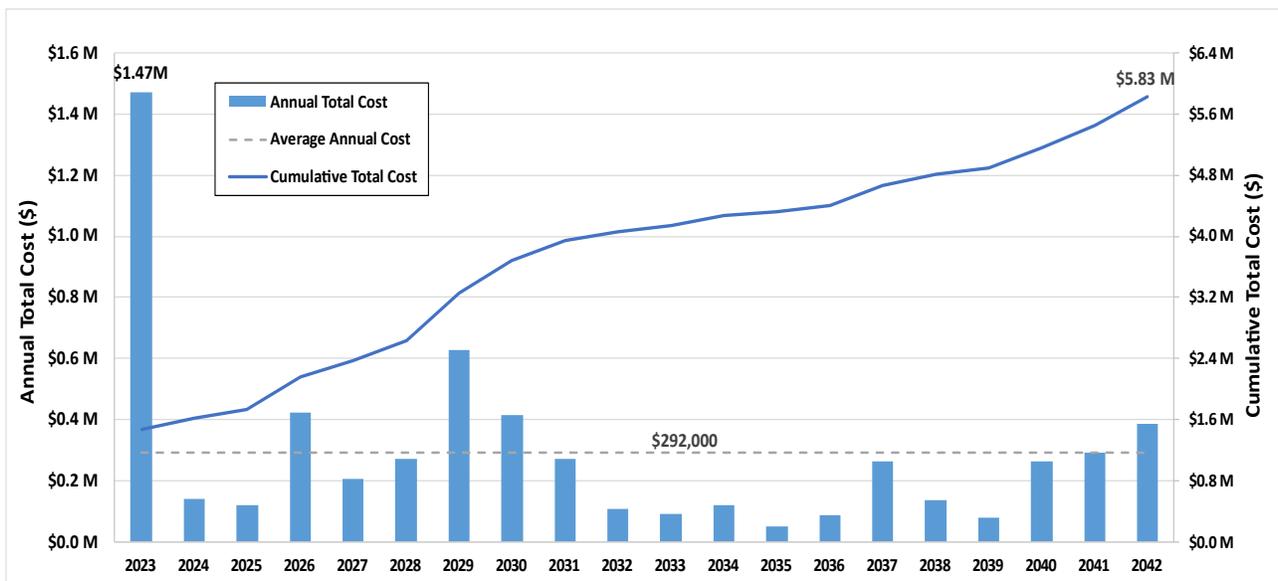
Figure 12 - Rehabilitation Needs based on Unconstrained Budget Scenario

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7.2 Constrained Budget Analysis

For this study, several budget scenarios were used to determine the effect on paved roadway network performance. The optimization method chosen was to maximize the present value of the pavement asset, weighted by User Priority Factors. This optimization effectively minimizes total cracking and especially high severity cracking because the asset value is defined as the as-new value minus the cost to repair those defects. Routine maintenance costs are excluded from the annual rehabilitation budgets.

Figure 13 shows the predicted average pavement condition in term of ACA and PCI for different annual capital budget levels. An annual capital budget of $250,000 is needed to remain the network average condition for the next 20 years.
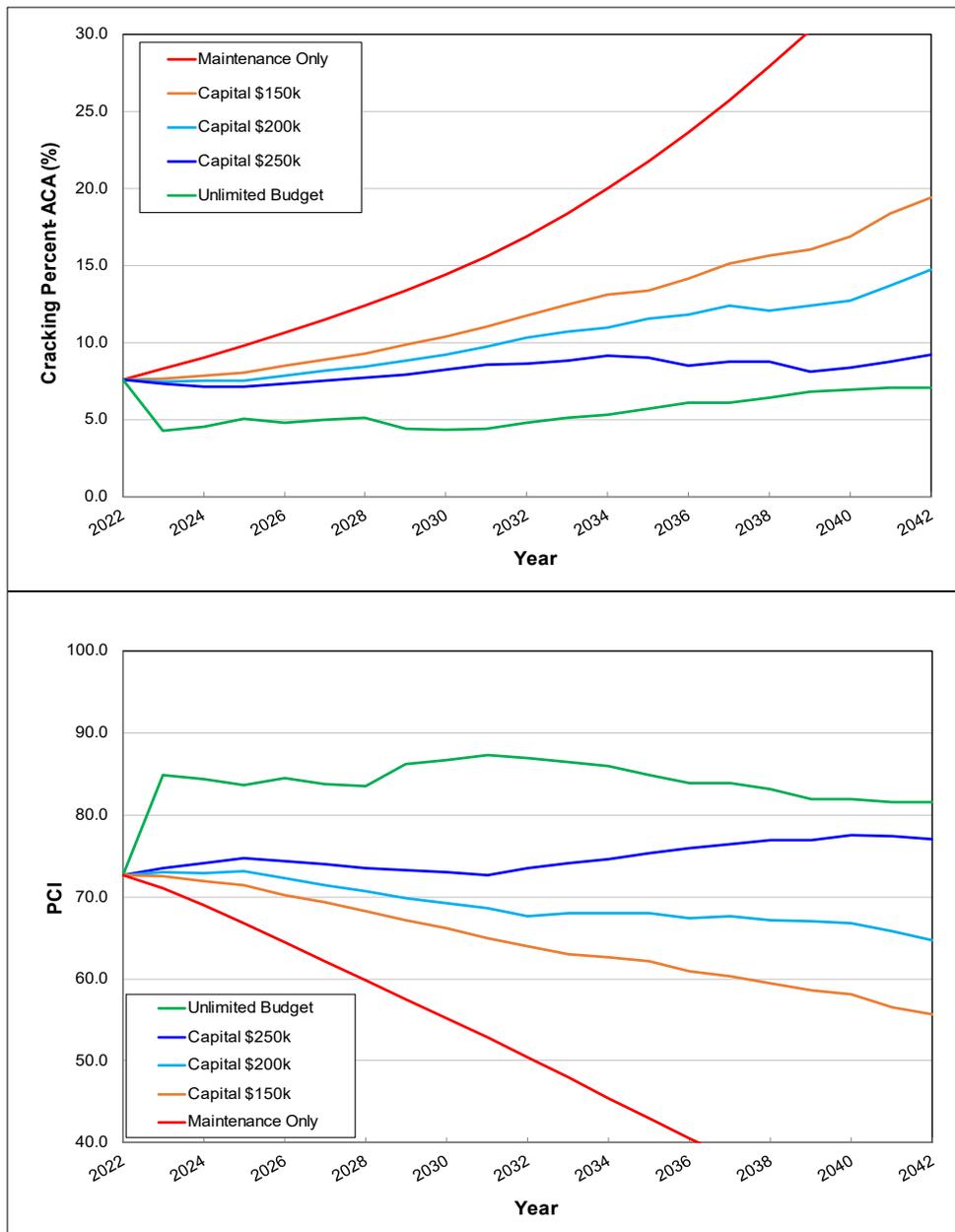
Figure 13 - Future ACA and PCI on Various Annual Capital Budget Scenarios

Table 8 shows a summary of a 20-year return on investment analysis for different budget scenarios. The return on investment (savings in maintenance cost and reduction in backlog in 2042) is increased with higher capital budgets. The table also shows that Maintenance Only is the most expensive in the long-term, considering that the network would deteriorate to the point where more costly rehabilitation and reconstruction would be necessary.

Table 8: 20-Year Return on Investment for Different Budget Scenarios ($, in Million)

	Budget Scenarios			
	Maintenance Only	$150 K / Year	$200 K / Year	$250 k / Year
Total Rehabilitation Cost (2023 to 2042)	0.0	2.88	3.86	4.86
Total Maintenance Cost (2023 to 2042)	2.65	1.56	1.22	0.87
Total Backlog Cost (in 2042)	7.79	3.84	2.61	1.17
Total Cost	10.44	8.28	7.69	6.90
Investment*	n/a	**2.88**	**3.86**	**4.86**
Return on Investment**		**5.04**	**6.61**	**8.40**

*Investment cost = total rehabilitation cost

**Return on investment = saving on total maintenance cost and backlog cost in 2042 compared to Maintenance Only strategy

Figure 14 and Figure 15 show predicted pavement condition distribution based on PCI at an annual capital budget of $150,000 and $250,000 respectively. With the annual capital budget of $150,000, the percentage of pavement segments in poor and very poor condition (% of backlog) is projected to slowly increase in the next 10 years. on the other hand, the annual capital budget of $250,000 program shows the network condition remains to the current status in the next 10 year, and slowly removing the backlog by the end of the 20-year analysis cycle.
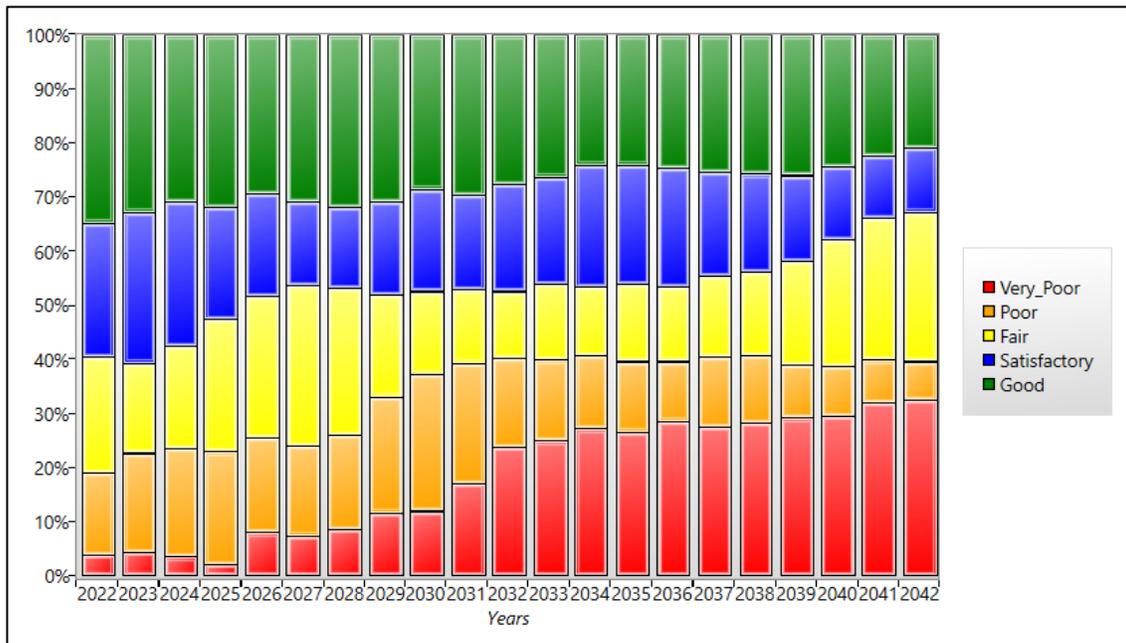
Figure 14 - Predicted PCI Distribution ($150,000 / year Capital Budget)

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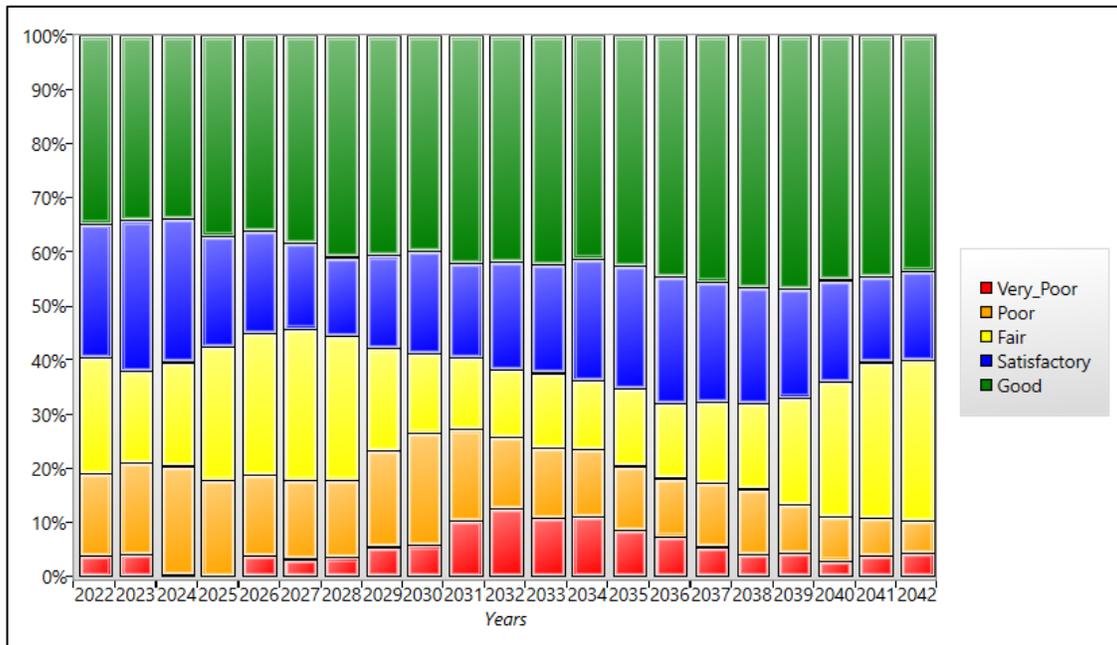
Figure 15 - Predicted PCI Distribution ($250,000 / year Capital Budget)

7.3 Multi-Year Rehabilitation Program

A detailed twenty-year paving plan in tabular and five-year paving map based upon the District's current $150,000 capital budget (starting from 2023) for the paved roads network are provided in Appendix C. This program includes only the rehabilitation treatments (not routine maintenance) chosen by the analysis. The rehabilitation program suggested should be confirmed by completing project-level assessments and designs.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Life-cycle cost analysis was conducted for each paved road segment. The purpose was to forecast the overall condition of the network with alternative budget scenarios, determine the long-term funding required to sustain the pavement network and backlog cost, and to develop a rehabilitation program.

Based on the needs-based scenario (unconstrained budget), the District would require around $1.47 million in the first year for rehabilitation of the road network. To remove all backlog roads as they arise over a 20-year period, the District would require annual funding of $292,000.

The constrained budgets investigated were annual capital budgets of $150,000, $200,000, and $250,000 for the road network rehabilitation. A capital budget of $250,000 per year would be necessary to maintain the pavement network condition.

The pavement rehabilitation plan is developed at a network-level based on the District's current budget. At the time of implementation, project-level assessments and designs should be completed. The District should consider updating the plan with new data in four to five years. This will provide an opportunity to update deterioration model calibration, include new or rehabilitated pavements in the plan. This timeframe is consistent with other municipalities in western Canada.

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9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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2022 Sep 12

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2022-Sep-12

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.

PERMIT NUMBER: 1001972

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REFERENCE

Yu, J., Chou, E., & Yau, J.-T. (2006). Development of Speed-Related Ride Quality Thresholds Using International Roughness Index. Transportation Research Record, No. 1974, 47-53.

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APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

DESIGN REPORT

1.1 USE OF DOCUMENT AND OWNERSHIP

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If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

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1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless so stipulated in the Design Report, TETRA TECH was not retained to explore, address or consider, and has not explored, addressed or considered any environmental or regulatory issues associated with the project specific design.

1.8 CALCULATIONS AND DESIGNS

TETRA TECH may have undertaken design calculations and prepared project specific designs in accordance with terms of reference that were previously set out in consultation with, and agreement of, TETRA TECH's client. These designs have been prepared to a standard that is consistent with current industry practice. Notwithstanding, if any error or omission is detected by TETRA TECH's Client or any party that is authorized to use the Design Report, the error or omission should be immediately drawn to the attention of TETRA TECH.

1.9 GEOTECHNICAL CONDITIONS

A Geotechnical Report is commonly the basis upon which the specific project design has been completed. It is incumbent upon TETRA TECH's Client, and any other authorized party, to be knowledgeable of the level of risk that has been incorporated into the project design, in consideration of the level of the geotechnical information that was reasonably acquired to facilitate completion of the design.

If a Geotechnical Report was prepared for the project by TETRA TECH, it may be included in the Design Report as appropriate. The Geotechnical Report contains Limitations that should be read in conjunction with these Limitations for the Design Report.

1.10 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This report has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

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APPENDIX B

2022 PAVEMENT CONDITION

Figure B1 – 2022 Percent All Cracking Area (ACA)

Figure B2 – 2022 Pavement Condition Index (PCI)

Appendix B - 2022 Pavement Condition Indices Spreadsheet
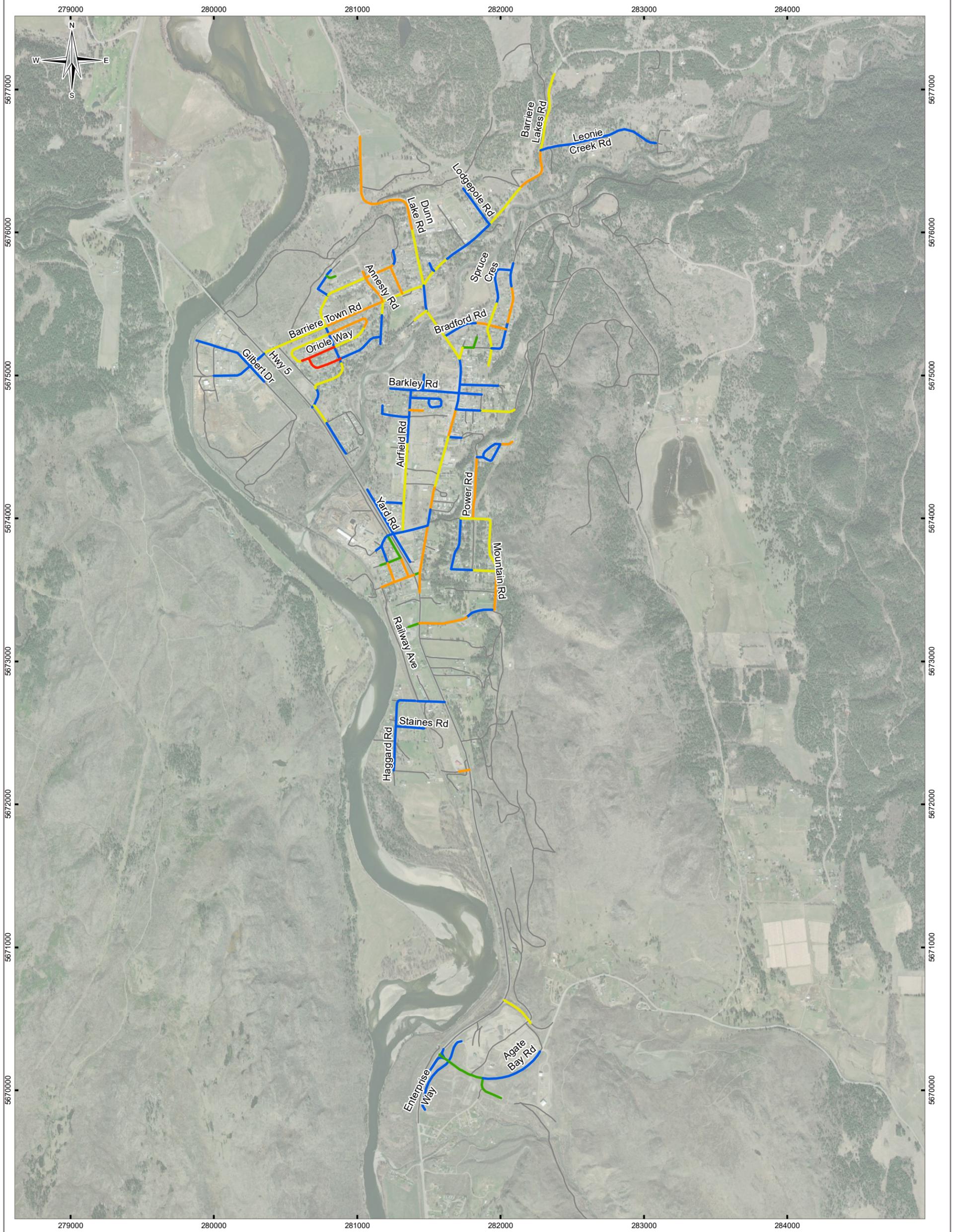
LEGEND

—— District Roadway

ACA (%)

—— Good (0 - 1)
—— Satisfactory (1 - 5)
—— Fair (5 - 10)
—— Poor (10 - 30)
—— Very Poor (30+)
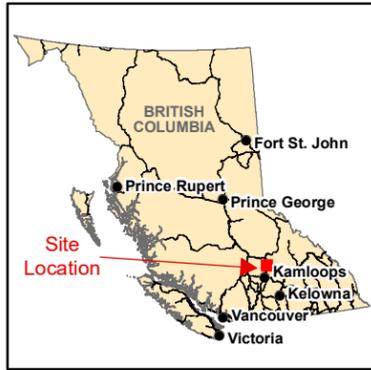
NOTES
Base Data Source:
Imagery provided from Maxar
via ESRI basemaps, 2020

**DISTRICT OF BARRIERE 2022
PAVEMENT CONDITION ASSESSMENT**

**2022 Percent All Cracking Area
(ACA)**

PROJECTION		DATUM		CLIENT
UTM ZONE 11		NAD83		TRUE

Scale: 1:25,000
200 100 0 200
Meters

FILE NO.
Barriere_FigureB1_ACA.mxd

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DATE	PROJECT NO.				
SEPTEMBER, 2022	TRN.ASMT03065-01				**Figure B1**

STATUS
ISSUED FOR USE

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LEGEND

—— District Roadway

PCI

—— Good (85 - 100)
—— Satisfactory (70 - 85)
—— Fair (55 - 70)
—— Poor (40 - 55)
—— Very Poor (0 - 40)

DISTRICT OF BARRIERE 2022
PAVEMENT CONDITION ASSESSMENT

2022 Pavement Condition Index
(PCI)

PROJECTION			DATUM		CLIENT
UTM ZONE 11			NAD83		

Scale: 1:25,000
200 100 0   200
Meters

TRUE

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BRITISH COLUMBIA

Fort St. John
Prince Rupert
Prince George

Site Location

Kamloops
Kelowna
Vancouver
Victoria

STATUS
ISSUED FOR USE

Road Name	Analysis ID	From	To	From Street	To Street	Length (m)	Road Class	Curb	Width (m)	ACA (%)	AFCA (%)	TCA (%)	PCI	IRI (mm/m)	RUT (mm)
Agate Bay Rd	ANA-001	0	348	Hwy 5	Old Sawmill Crt	348	Local	N	8.0	0.7	0.1	0.6	97.9	1.9	2.3
Agate Bay Rd	ANA-002	348	814	Old Sawmill Crt	Northeast End	466	Local	N	8.0	1.6	0.0	1.6	97.3	0.9	2.0
Airfield Rd	ANA-003	0	201	Station Rd	Carlstrom Rd	201	Local	N	7.0	5.7	1.9	3.8	72.1	3.7	3.8
Airfield Rd	ANA-004	201	630	Carlstrom Rd	Section Break	429	Local	N	7.0	7.5	1.9	5.6	56.0	2.9	5.1
Airfield Rd	ANA-005	630	800	Section Break	Bartlett Rd	170	Local	N	7.0	3.0	0.5	2.5	71.4	2.5	3.7
Airfield Rd	ANA-006	800	995	Bartlett Rd	Barkley Rd	195	Local	N	7.0	2.2	1.0	1.2	91.6	2.9	2.6
Airfield Rd_1	ANA-007	0	133	Airfield Rd	Section Break	133	Local	N	6.0	3.8	1.1	2.7	66.0	-	4.4
Airfield Rd_1	ANA-008	133	392	Section Break	West End	259	Local	N	6.0	1.1	0.3	0.8	76.6	3.9	4.7
Annesty Rd	ANA-009	0	255	Barriere Town Rd / Gibbs Rd	Northwest End	255	Local	N	7.0	21.6	7.3	14.3	41.8	5.0	4.7
Armour Rd	ANA-010	0	91	Barriere Town Rd	Armour Rd	91	Local	N	6.0	1.3	0.0	1.3	86.4	5.3	3.9
Bannister Rd	ANA-011	0	75	Genier Rd	North End	75	Local	N	6.0	0.7	0.0	0.7	86.3	-	2.7
Barkley Rd	ANA-012	0	227	West End	Kivi Cres	227	Local	N	6.5	2.7	0.4	2.3	89.3	1.9	1.6
Barkley Rd	ANA-013	227	480	Kivi Cres	Barriere Town Rd / Salle Rd	253	Local	N	6.5	3.7	0.4	3.3	91.7	1.7	2.3
Barriere Lakes Rd	ANA-014	0	250	Barriere Town Rd / Dunn Lake Rd	Section Break	250	Local	N	7.0	5.5	0.1	5.4	74.2	2.7	5.2
Barriere Lakes Rd	ANA-015	250	633	Section Break	Lodgepole Rd	383	Local	N	7.0	4.8	0.3	4.5	87.8	1.2	4.2
Barriere Lakes Rd	ANA-016	633	977	Lodgepole Rd	Section Break	344	Local	N	7.0	5.5	0.6	4.9	87.4	1.4	3.9
Barriere Lakes Rd	ANA-017	977	1306	Section Break	Leonie Creek Rd	329	Local	N	7.0	13.4	4.0	9.4	76.6	2.2	3.5
Barriere Lakes Rd	ANA-018	1306	1555	Leonie Creek Rd	Section Break	249	Local	N	7.0	9.5	1.7	7.8	77.5	2.5	3.2
Barriere Lakes Rd	ANA-019	1555	1853	Section Break	North End	298	Local	N	7.0	7.4	0.8	6.6	83.6	1.7	2.4
Barriere Town Rd	ANA-020	139	282	Jackpine Dr	Section Break	143	Collector	N	8.0	4.5	1.0	3.5	68.5	2.9	4.4
Barriere Town Rd	ANA-021	282	545	Section Break	Hwy 5	263	Collector	N	8.0	2.4	0.0	2.4	75.2	3.0	4.1
Barriere Town Rd	ANA-022	546	1021	Hwy 5	McLean Rd	475	Collector	N	11.0	6.4	1.0	5.4	86.4	1.5	3.6
Barriere Town Rd	ANA-023	1021	1449	McLean Rd	Annesty Rd / Gibbs Rd	428	Collector	N	11.0	10.6	2.9	7.7	80.8	1.3	3.9
Barriere Town Rd	ANA-024	1449	1759	Annesty Rd / Gibbs Rd	Barriere Lakes Rd / Dunn Lake Rd	310	Collector	N	11.0	6.3	0.8	5.5	83.1	1.8	4.3
Barriere Town Rd	ANA-025	1759	1938	Barriere Lakes Rd / Dunn Lake Rd	Fouquet Rd	179	Collector	R	9.0	2.6	0.2	2.4	93.2	4.3	3.7
Barriere Town Rd	ANA-026	1938	2155	Fouquet Rd	Bradford Rd	217	Collector	N	9.0	7.4	1.0	6.4	76.7	2.0	4.3
Barriere Town Rd	ANA-027	2155	2342	Bradford Rd	Shaver Rd	187	Collector	N	11.0	8.2	2.6	5.6	86.5	1.6	3.8
Barriere Town Rd	ANA-028	2342	2583	Shaver Rd	Barkley Rd / Salle Rd	241	Collector	N	11.0	3.8	0.7	3.1	85.3	2.2	3.0
Barriere Town Rd	ANA-029	2583	2700	Barkley Rd / Salle Rd	Dixon Creek Rd	117	Collector	N	11.0	3.7	0.5	3.2	90.2	2.0	3.2
Barriere Town Rd	ANA-030	2700	2900	Dixon Creek Rd	Armour Rd	200	Collector	N	11.0	14.4	3.9	10.5	75.6	1.2	4.5
Barriere Town Rd	ANA-031	2900	3253	Armour Rd	Section Break	353	Collector	N	11.0	10.0	1.4	8.6	81.3	1.7	4.6
Barriere Town Rd	ANA-032	3253	3423	Section Break	Barriere Town Rd	170	Collector	N	11.0	13.4	4.6	8.8	70.1	1.3	4.5
Barriere Town Rd	ANA-033	3423	3540	Barriere Town Rd	Station Rd	117	Collector	N	11.0	4.9	0.8	4.1	90.3	2.6	4.1
Barriere Town Rd	ANA-034	3540	3870	Station Rd	Barriere Town Rd	330	Collector	N	11.0	12.3	2.8	9.5	76.1	1.7	3.8
Barriere Town Rd	ANA-035	3870	4011	Barriere Town Rd	Hwy 5	141	Collector	N	5.0	18.1	5.9	12.2	53.9	1.8	4.6
Barriere Town Rd_1	ANA-036	0	44	Hwy 5 / Lilley Rd	Barriere Town Rd	44	Collector	N	9.0	0.9	0.0	0.9	94.2	6.4	1.7
Bartlett Rd	ANA-037	0	188	Saul Rd	Airfield Rd	188	Local	N	7.0	1.5	0.1	1.4	95.8	1.8	1.8
Birch Lane	ANA-038	0	255	Spruce Cres	Pavement Change	255	Local	N	7.0	2.1	0.4	1.7	85.9	3.8	3.7
Birch Lane	ANA-039	255	512	Pavement Change	Pavement Change	257	Local	N	6.0	14.8	6.0	8.8	42.4	5.4	6.9
Birch Lane	ANA-040	512	675	Pavement Change	Pavement Change	163	Local	N	6.0	4.9	1.3	3.6	73.8	2.4	2.8
Borthwick Ave	ANA-041	0	141	Lilley Rd	Kamloops St	141	Local	N	7.0	12.6	5.4	7.2	53.0	4.9	5.1
Borthwick Ave	ANA-042	141	266	Kamloops St	Station Rd	125	Local	N	7.0	1.5	0.4	1.1	87.9	3.3	2.7
Bradford Rd	ANA-043	0	240	Barriere Town Rd	Pavement Change	240	Local	N	7.0	2.8	0.6	2.2	82.2	2.6	2.9
Bradford Rd	ANA-044	240	334	Pavement Change	Spruce Cres	94	Local	N	6.0	12.8	5.0	7.8	54.7	3.9	4.4
Bradford Rd	ANA-045	334	457	Spruce Cres	Birch Lane	123	Local	N	6.0	10.4	4.8	5.6	34.2	7.1	5.5
Carlstrom Rd	ANA-046	0	203	Yard Rd	Airfield Rd	203	Local	N	7.0	1.2	0.0	1.2	96.8	1.8	1.6
Clary Rd	ANA-047	0	67	Siska Dr	East End	67	Local	N	7.0	0.2	0.0	0.2	90.7	5.7	2.2
Conner Rd	ANA-048	0	145	Lilley Rd	Kamloops St	145	Local	N	8.5	23.8	12.5	11.3	26.7	6.7	5.3
Conner Rd	ANA-049	145	323	Kamloops St	Station Rd	178	Local	N	7.5	0.0	0.0	0.0	99.8	2.6	1.8
Deejay Rd	ANA-050	0	148	Barriere Town Rd	Pavement Change	148	Local	N	7.0	3.1	0.2	2.9	88.9	3.5	1.3
Deejay Rd	ANA-051	148	443	Pavement Change	Robin Dr	295	Local	N	7.0	10.0	2.8	7.2	62.1	4.2	3.0
Deejay Rd	ANA-052	443	722	Robin Dr	Barriere Town Rd / McLean Rd	279	Local	N	7.0	4.3	0.2	4.1	92.0	3.0	1.5
Dixon Creek Rd	ANA-053	0	169	Barriere Town Rd	Section Break	169	Local	N	7.0	3.6	0.5	3.1	74.6	3.6	4.6
Dixon Creek Rd	ANA-054	169	413	Section Break	East End	244	Local	N	7.0	8.3	3.5	4.8	46.7	6.4	7.7
Dunn Lake Rd	ANA-055	0	405	Barriere Lakes Rd / Barriere Town Rd	Access Road	405	Local	N	7.0	6.6	1.7	4.9	56.5	3.3	5.4
Dunn Lake Rd	ANA-056	405	715	Access Road	Pavement Change	310	Local	N	7.0	13.9	4.5	9.4	55.6	2.6	4.5
Dunn Lake Rd	ANA-057	715	960	Pavement Change	Pavement Change	245	Local	N	7.0	29.4	8.8	20.6	44.3	5.0	6.0
Dunn Lake Rd	ANA-058	960	1346	Pavement Change	North End	386	Local	N	7.0	13.2	4.5	8.7	46.7	4.7	6.0
Dunsmuir Rd	ANA-059	0	173	Mountain Rd	Section Break	173	Local	N	7.0	6.5	3.1	3.4	49.5	9.1	6.4
Dunsmuir Rd	ANA-060	173	350	Section Break	Section Break	177	Local	N	7.0	3.7	1.4	2.3	66.4	6.5	4.3
Dunsmuir Rd	ANA-061	350	500	Section Break	Section Break	150	Local	N	7.0	5.0	2.0	3.0	50.6	7.9	6.0
Dunsmuir Rd	ANA-062	500	687	Section Break	Mountain Rd	187	Local	N	7.0	3.7	1.3	2.4	60.9	7.8	7.0
Enterprise Way	ANA-063	0	406	South End	Agate Bay Rd	406	Local	N	9.0	1.2	0.1	1.1	96.7	1.4	1.2
Enterprise Way	ANA-064	406	584	Agate Bay Rd	Northeast End	178	Local	N	9.0	2.8	0.3	2.5	94.4	2.7	1.8
Fouquet Rd	ANA-065	70	176	Southwest End	Barriere Town Rd	106	Local	N	6.0	6.9	3.7	3.2	46.5	4.1	5.7
Genier Rd	ANA-066	0	75	Shaver Rd	Bannister Rd	75	Local	N	7.0	0.7	0.0	0.7	90.3	-	2.1
Gibbs Rd	ANA-067	0	200	South End	Section Break	200	Local	N	7.0	2.4	0.3	2.1	90.5	5.1	2.5
Gibbs Rd	ANA-068	200	297	Section Break	Annesty Rd / Barriere Town Rd	97	Local	N	7.0	6.8	1.9	4.9	75.1	4.3	3.8
Gilbert Dr	ANA-069	0	300	West End	Section Break	300	Local	N	7.0	2.9	0.7	2.2	88.9	3.6	3.6
Gilbert Dr	ANA-070	300	571	Section Break	Southeast End	271	Local	N	7.0	1.2	0.1	1.1	92.3	4.4	3.6
Glentanna Rd	ANA-071	0	204	Barriere Town Rd	McLean Rd	204	Local	N	7.0	13.5	4.1	9.4	54.3	3.5	4.8
Gray Pl	ANA-072	0	92	Airfield Rd	East End	92	Local	N	9.0	27.3	10.5	16.8	44.6	-	3.7
Haggard Rd	ANA-073	105	311	South End	Nelson Rd	206	Local	N	6.0	1.6	0.1	1.5	69.1	6.3	6.2
Haggard Rd	ANA-074	311	453	Nelson Rd	Section Break	142	Local	N	6.0	3.0	0.2	2.8	62.1	5.7	8.5
Haggard Rd	ANA-075	453	594	Section Break	Hall Rd	141	Local	N	6.0	3.1	1.3	1.8	47.7	5.4	5.9
Haigh Rd	ANA-076	0	266	Barriere Town Rd	private driveway	266	Local	N	7.0	3.9	1.5	2.4	74.8	3.6	3.5
Hall Rd	ANA-077	0	121	Haggard Rd	Rail Break	121	Local	N	7.0	2.4	0.2	2.2	71.4	5.1	4.5
Hall Rd	ANA-078	135	326	Rail Break	Hwy 5	191	Local	N	7.0	3.1	0.9	2.2	73.5	2.2	3.6
Hanson Rd	ANA-079	0	248	Hwy 5	Southeast End	248	Local	N	7.5	5.9	0.1	5.8	89.1	3.3	2.1
Kamloops St	ANA-080	50	200	Southeast End	Conner Rd	150	Local	N	8.0	0.6	0.0	0.6	99.4	1.7	1.5
Kivi Cres	ANA-081	0	109	Barkley Rd	North End	109	Local	N	8.0	2.3	0.3	2.0	88.3	3.1	2.3
Leonie Creek Rd	ANA-082	0	240	Barriere Lakes Rd	Pavement Change	240	Local	N	6.5	3.0	1.0	2.0	75.0	5.7	4.8
Leonie Creek Rd	ANA-083	240	435	Pavement Change	Pavement Change	195	Local	N	6.5	2.3	0.2	2.1	82.9	4.4	4.6
Leonie Creek Rd	ANA-084	435	608	Pavement Change	Section Break	173	Local	N	6.5	2.5	0.7	1.8	69.5	4.4	4.6
Leonie Creek Rd	ANA-085	608	850	Section Break	East End	242	Local	N	6.5	3.2	0.9	2.3	53.5	4.7	8.5
Lilley Rd	ANA-086	0	100	Railway Ave	Borthwick Ave	100	Road Class	N	7.0	27.6	13.2	14.4	19.8	5.5	7.0
Lilley Rd	ANA-087	100	242	Borthwick Ave	Barriere Town Rd / Hwy 5	142	Road Class	Curb	7.0	21.6	10.8	10.8	34.8	7.1	6.1
Lodgepole Rd	ANA-088	0	309	Barriere Lakes Rd	Northwest End	309	Local	N	7.5	4.5	0.7	3.8	89.3	2.8	1.9
McLean Rd	ANA-089	0	238	Barriere Town Rd / Deejay Rd	Siska Dr	238	Local	N	6.5	7.0	0.8	6.2	89.0	2.6	1.5
McLean Rd	ANA-090	238	525	Siska Dr	Annesty Rd	287	Local	N	6.5	9.9	2.8	7.1	68.6	4.0	3.5
McLean Rd	ANA-091	525	735	Annesty Rd	Pavement Change	210	Local	N	6.5	13.7	2.5	11.2	69.2	3.4	2.1
McLean Rd	ANA-092	735	845	Pavement Change	North End	110	Local	N	6.5	5.0	0.3	4.7	93.3	2.8	1.6
Mountain Rd	ANA-093	0	337	Hwy 5 / Newberry Rd	Section Break	337	Local	N	7.0	22.5	11.7	10.8	18.7	6.8	8.2
Mountain Rd	ANA-094	337	530	Section Break	Pavement Change	193	Local	N	7.0	4.9	1.6	3.3	74.3	3.9	4.1
Mountain Rd	ANA-095	530	814	Pavement Change	Dunsmuir Rd	284	Local	N	7.0	10.8	3.7	7.1	55.1	6.4	4.4
Mountain Rd	ANA-096	814	1185	Dunsmuir Rd	Section Break	371	Local	N	7.0	5.1	2.5	2.6	49.0	7.0	7.3
Mountain Rd	ANA-097	1185	1390	Section Break	Dunsmuir Rd	205	Local	N	7.0	8.5	2.9	5.6	54.1	7.5	6.6
Newberry Rd	ANA-098	0	79	Southwest End	Hwy 5 / Mountain Rd	79	Local	N	8.0	1.0	0.3	0.7	95.9	4.2	2.4
Old Sawmill Crt	ANA-099	0	222	Agate Bay Rd	East End	222	Local	N	10.0	0.8	0.0	0.8	99.2	1.8	1.6
Oriole Way	ANA-100	0	400	Deejay Rd	Section Break	400	Local	N	6.5	7.3	1.1	6.2	88.1	1.9	1.7

Appendix B - Pavement Condition Indices

District of Barriere
2022 Roadway Data Collection and Pavement Management Plan
FILE: TRN.ASMT03065-01 | September, 2022 | ISSUED FOR USE

Road Name	Analysis ID	From	To	From Street	To Street	Length (m)	Road Class	Curb	Width (m)	ACA (%)	AFCA (%)	TCA (%)	PCI	IRI (mm/m)	RUT (mm)
Oriole Way	ANA-101	400	645	Section Break	Deejay Rd	245	Local	N	6.5	34.8	9.1	25.7	51.8	2.8	3.9
Oriole Way	ANA-102	645	905	Deejay Rd	Section Break	260	Local	N	6.5	8.1	1.1	7.0	69.1	4.2	4.1
Oriole Way	ANA-103	905	1245	Section Break	Southwest End	340	Local	N	6.5	17.4	5.1	12.3	43.5	5.6	5.0
Power Rd	ANA-104	0	430	Mountain Rd	Power Rd	430	Local	N	7.0	21.2	5.7	15.5	66.4	3.0	3.5
Power Rd_1	ANA-105	0	167	Power Rd	Power Rd	167	Local	N	6.0	2.5	0.6	1.9	77.6	-	3.2
Power Rd_2	ANA-106	0	232	Power Rd	Power Rd	232	Local	N	6.0	1.2	0.1	1.1	84.1	2.8	2.3
Power Rd_2	ANA-107	232	329	Power Rd	East End	97	Local	N	6.0	13.3	8.1	5.2	39.1	-	8.1
Robin Dr	ANA-108	0	270	Oriole Way	Deejay Rd	270	Local	N	7.0	50.8	9.3	41.5	55.7	2.8	2.8
Robin Dr	ANA-109	270	596	Deejay Rd	Gibbs Rd	326	Local	N	7.0	4.4	1.3	3.1	59.5	6.0	5.0
Russell St	ANA-110	124	199	West End	Hwy 5	75	Local	N	10.0	10.9	4.7	6.2	34.9	5.9	5.4
Salle Rd	ANA-111	0	159	Barkley Rd / Barriere Town Rd	East End	159	Local	N	7.0	2.4	0.5	1.9	83.4	3.7	2.5
Saul Rd	ANA-112	0	58	Bartlett Rd	North End	58	Local	N	6.5	1.6	0.0	1.6	63.5	-	4.4
Shaver Rd	ANA-113	0	80	Barriere Town Rd	Genier Rd	80	Local	N	7.0	5.3	2.4	2.9	67.5	3.8	3.9
Siska Dr	ANA-114	0	242	McLean Rd	Northeast End	242	Local	N	7.0	2.3	0.5	1.8	95.6	3.5	1.6
Spruce Cres	ANA-115	0	289	South End	Bradford Rd	289	Local	N	7.0	9.4	4.2	5.2	59.6	6.2	4.2
Spruce Cres	ANA-116	289	450	Bradford Rd	Section Break	161	Local	N	7.0	7.8	2.7	5.1	65.2	5.1	4.5
Spruce Cres	ANA-117	450	789	Section Break	Birch Lane	339	Local	N	7.0	4.0	0.5	3.5	90.3	2.0	1.5
Staines Rd	ANA-118	0	198	Haggard Rd	East End	198	Local	N	6.0	2.2	0.6	1.6	73.9	3.9	3.7
Station Rd	ANA-119	0	135	Railway Ave	Conner Rd	135	Local	N	7.0	3.0	1.6	1.4	57.3	8.1	4.9
Station Rd	ANA-120	135	423	Conner Rd	Barriere Town Rd	288	Local	N	7.0	1.6	0.1	1.5	95.2	2.9	2.4
Summer Rd	ANA-121	0	152	Deejay Rd	Section Break	152	Local	N	6.0	8.1	2.3	5.8	56.3	10.8	6.0
Summer Rd	ANA-122	152	405	Section Break	East End	253	Local	N	6.0	2.4	0.6	1.8	51.2	8.3	7.3
Summers Rd	ANA-123	0	64	Barriere Lakes Rd	Northwest End	64	Local	N	8.0	1.1	0.0	1.1	85.2	4.7	3.3
turning lane_1	ANA-124	0	167	Hwy 5	Agate Bay Rd	167	Local	R	4.0	1.7	0.3	1.4	94.7	2.4	3.9
turning lane_2	ANA-125	0	71	Agate Bay Rd	Hwy 5	71	Local	R	4.0	2.0	0.0	2.0	89.0	3.1	4.0
Yard Rd	ANA-126	0	228	Southeast End	Station Rd	228	Local	N	8.0	3.5	2.1	1.4	79.3	3.6	2.6
Yard Rd	ANA-127	228	588	Station Rd	Northwest End	360	Local	N	8.0	3.3	0.9	2.4	62.5	4.5	3.5

TETRA TECH

APPENDIX C

REHABILITATION PROGRAM

Map C – 5-Year Paving Plan (Capital Funding of $150,000 per year from 2023)

Rehabilitation Program Spreadsheet

C:\Users\alex.liang\Desktop\Dist_of_Barriere\GIS\Barriere_FigureC_Paving_Plan.mxd modified 8/15/2022 by alex.liang

LEGEND

— District Roadway

Treatment Year
— 2023
— 2024
— 2025
— 2026
— 2027

DISTRICT OF BARRIERE 2022
PAVEMENT CONDITION ASSESSMENT

5-Year Paving Plan
Capital $150K

| PROJECTION | DATUM | CLIENT |
| UTM ZONE 11 | NAD83 | |

Scale: 1:25,000
200 100 0 200
Meters

TRUE

FILE NO.
Barriere_FigureC_Paving_Plan.mxd

| OFFICE | DWN | CKD | APVD | REV |
| Tt-VANC | AL | YL | AR | 0 |

Tt TETRA TECH

DATE
SEPTEMBER, 2022

PROJECT NO.
TRN.ASMT03065-01

STATUS
ISSUED FOR USE

Map C

BRITISH COLUMBIA

Fort St. John

Prince Rupert

Prince George

Site Location

Kamloops
Kelowna
Vancouver
Victoria

Appendix C - Paving Plan ($150 K Capital)

District of Barriere
2022 Roadway Data Collection and Pavement Management Plan
FILE: TRN.ASMT03058-01 | Sepember, 2022 | ISSUED FOR USE

Road Name	Analysis ID	From	To	From Street	To Street	Length (m)	Road Class	Curb	Width (m)	Treatment Year	Treatment Type	Treatment Cost
Agate Bay Rd	ANA-001	0	348	Hwy 5	Old Sawmill Crt	348	Local	N	8			
Agate Bay Rd	ANA-002	348	814	Old Sawmill Crt	Northeast End	466	Local	N	8			
Airfield Rd	ANA-003	0	201	Station Rd	Carlstrom Rd	201	Local	N	7			
Airfield Rd	ANA-004	201	630	Carlstrom Rd	Section Break	429	Local	N	7			
Airfield Rd	ANA-005	630	800	Section Break	Bartlett Rd	170	Local	N	7			
Airfield Rd	ANA-006	800	995	Bartlett Rd	Barkley Rd	195	Local	N	7			
Airfield Rd_1	ANA-007	0	133	Airfield Rd	Section Break	133	Local	N	6	2038	OL_50	$26,720
Airfield Rd_1	ANA-008	133	392	Section Break	West End	259	Local	N	6			
Annesty Rd	ANA-009	0	255	Barriere Town Rd / Gibbs Rd	Northwest End	255	Local	N	7	2023	OL_50	$55,222
Armour Rd	ANA-010	0	91	Barriere Town Rd	Armour Rd	91	Local	N	6	2041	OL_50	$16,096
Bannister Rd	ANA-011	0	75	Genier Rd	North End	75	Local	N	6			
Barkley Rd	ANA-012	0	227	West End	Kivi Cres	227	Local	N	7			
Barkley Rd	ANA-013	227	480	Kivi Cres	Barriere Town Rd / Salle Rd	253	Local	N	7			
Barriere Lakes Rd	ANA-014	0	250	Barriere Town Rd / Dunn Lake Rd	Section Break	250	Local	N	7			
Barriere Lakes Rd	ANA-015	250	633	Section Break	Lodgepole Rd	383	Local	N	7			
Barriere Lakes Rd	ANA-016	633	977	Lodgepole Rd	Section Break	344	Local	N	7			
Barriere Lakes Rd	ANA-017	977	1306	Section Break	Leonie Creek Rd	329	Local	N	7			
Barriere Lakes Rd	ANA-018	1306	1555	Leonie Creek Rd	Section Break	249	Local	N	7			
Barriere Lakes Rd	ANA-019	1555	1853	Section Break	North End	298	Local	N	7			
Barriere Town Rd	ANA-020	139	282	Jackpine Dr	Section Break	143	Collector	N	8	2027	OL_50	$32,568
Barriere Town Rd	ANA-021	282	545	Section Break	Hwy 5	263	Collector	N	8	2031	OL_50	$63,441
Barriere Town Rd	ANA-022	546	1021	Hwy 5	McLean Rd	475	Collector	N	11			
Barriere Town Rd	ANA-023	1021	1449	McLean Rd	Annesty Rd / Gibbs Rd	428	Collector	N	11			
Barriere Town Rd	ANA-024	1449	1759	Annesty Rd / Gibbs Rd	Barriere Lakes Rd / Dunn Lake Rd	310	Collector	N	11	2032	OL_50	$111,373
Barriere Town Rd	ANA-025	1759	1938	Barriere Lakes Rd / Dunn Lake Rd	Fouquet Rd	179	Collector	R	9	2036	Mill_75	$82,919
Barriere Town Rd	ANA-026	1938	2155	Fouquet Rd	Bradford Rd	217	Collector	N	9	2029	OL_50	$58,648
Barriere Town Rd	ANA-027	2155	2342	Bradford Rd	Shaver Rd	187	Collector	N	11	2031	OL_50	$71,376
Barriere Town Rd	ANA-028	2342	2583	Shaver Rd	Barkley Rd / Salle Rd	241	Collector	N	11	2029	OL_50	$78,482
Barriere Town Rd	ANA-029	2583	2700	Barkley Rd / Salle Rd	Dixon Creek Rd	117	Collector	N	11	2033	OL_50	$42,739
Barriere Town Rd	ANA-030	2700	2900	Dixon Creek Rd	Armour Rd	200	Collector	N	11	2026	OL_50	$67,835
Barriere Town Rd	ANA-031	2900	3253	Armour Rd	Section Break	353	Collector	N	11	2030	OL_50	$122,555
Barriere Town Rd	ANA-032	3253	3423	Section Break	Barriere Town Rd	170	Collector	N	11	2026	OL_50	$59,028
Barriere Town Rd	ANA-033	3423	3540	Barriere Town Rd	Station Rd	117	Collector	N	11	2033	OL_50	$43,555
Barriere Town Rd	ANA-034	3540	3870	Station Rd	Barriere Town Rd	330	Collector	N	11	2028	OL_50	$114,396
Barriere Town Rd	ANA-035	3870	4011	Barriere Town Rd	Hwy 5	141	Collector	N	5	2023	OL_50	$21,109
Barriere Town Rd_1	ANA-036	0	44	Hwy 5 / Lilley Rd	Barriere Town Rd	44	Collector	N	9	2032	OL_50	$12,304
Bartlett Rd	ANA-037	0	188	Saul Rd	Airfield Rd	188	Local	N	7			
Birch Lane	ANA-038	0	255	Spruce Cres	Pavement Change	255	Local	N	7			
Birch Lane	ANA-039	255	512	Pavement Change	Pavement Change	257	Local	N	6	2025	OL_50	$48,706
Birch Lane	ANA-040	512	675	Pavement Change	Pavement Change	163	Local	N	6	2035	OL_50	$30,703
Borthwick Ave	ANA-041	0	141	Lilley Rd	Kamloops St	141	Local	N	7	2025	OL_50	$30,526
Borthwick Ave	ANA-042	141	266	Kamloops St	Station Rd	125	Local	N	7			
Bradford Rd	ANA-043	0	240	Barriere Town Rd	Pavement Change	240	Local	N	7			
Bradford Rd	ANA-044	240	334	Pavement Change	Spruce Cres	94	Local	N	6	2027	OL_50	$18,278
Bradford Rd	ANA-045	334	457	Spruce Cres	Birch Lane	123	Local	N	6	2024	OL_50	$21,797
Carlstrom Rd	ANA-046	0	203	Yard Rd	Airfield Rd	203	Local	N	7			
Clary Rd	ANA-047	0	67	Siska Dr	East End	67	Local	N	7			
Conner Rd	ANA-048	0	145	Lilley Rd	Kamloops St	145	Local	N	9	2025	OL_50	$47,724
Conner Rd	ANA-049	145	323	Kamloops St	Station Rd	178	Local	N	8			
Deejay Rd	ANA-050	0	148	Barriere Town Rd	Pavement Change	148	Local	N	7			
Deejay Rd	ANA-051	148	443	Pavement Change	Robin Dr	295	Local	N	7	2034	OL_50	$76,102
Deejay Rd	ANA-052	443	722	Robin Dr	Barriere Town Rd / McLean Rd	279	Local	N	7			
Dixon Creek Rd	ANA-053	0	169	Barriere Town Rd	Section Break	169	Local	N	7			
Dixon Creek Rd	ANA-054	169	413	Section Break	East End	244	Local	N	7			
Dunn Lake Rd	ANA-055	0	405	Barriere Lakes Rd / Barriere Town Rd	Access Road	405	Local	N	7			
Dunn Lake Rd	ANA-056	405	715	Access Road	Pavement Change	310	Local	N	7			
Dunn Lake Rd	ANA-057	715	960	Pavement Change	Pavement Change	245	Local	N	7	2038	FDM	$85,750
Dunn Lake Rd	ANA-058	960	1346	Pavement Change	North End	386	Local	N	7	2027	OL_50	$85,566
Dunsmuir Rd	ANA-059	0	173	Mountain Rd	Section Break	173	Local	N	7	2033	OL_50	$43,954
Dunsmuir Rd	ANA-060	173	350	Section Break	Section Break	177	Local	N	7	2034	OL_50	$38,318
Dunsmuir Rd	ANA-061	350	500	Section Break	Section Break	150	Local	N	7	2028	OL_50	$29,865
Dunsmuir Rd	ANA-062	500	687	Section Break	Mountain Rd	187	Local	N	7			
Enterprise Way	ANA-063	0	406	South End	Agate Bay Rd	406	Local	N	9			
Enterprise Way	ANA-064	406	584	Agate Bay Rd	Northeast End	178	Local	N	9			
Fouquet Rd	ANA-065	70	176	Southwest End	Barriere Town Rd	106	Local	N	6	2026	OL_50	$18,901
Genier Rd	ANA-066	0	75	Shaver Rd	Bannister Rd	75	Local	N	7			
Gibbs Rd	ANA-067	0	200	South End	Section Break	200	Local	N	7			
Gibbs Rd	ANA-068	200	297	Section Break	Annesty Rd / Barriere Town Rd	97	Local	N	7			
Gilbert Dr	ANA-069	0	300	West End	Section Break	300	Local	N	7			
Gilbert Dr	ANA-070	300	571	Section Break	Southeast End	271	Local	N	7			
Glentanna Rd	ANA-071	0	204	Barriere Town Rd	McLean Rd	204	Local	N	7			
Gray Pl	ANA-072	0	92	Airfield Rd	East End	92	Local	N	9	2024	OL_50	$28,914
Haggard Rd	ANA-073	105	311	South End	Nelson Rd	206	Local	N	6			
Haggard Rd	ANA-074	311	453	Nelson Rd	Section Break	142	Local	N	6			
Haggard Rd	ANA-075	453	594	Section Break	Hall Rd	141	Local	N	6	2032	OL_50	$24,599
Haigh Rd	ANA-076	0	266	Barriere Town Rd	private driveway	266	Local	N	7			
Hall Rd	ANA-077	0	121	Haggard Rd	Rail Break	121	Local	N	7			
Hall Rd	ANA-078	135	326	Rail Break	Hwy 5	191	Local	N	7	2039	OL_50	$44,207
Hanson Rd	ANA-079	0	248	Hwy 5	Southeast End	248	Local	N	8			
Kamloops St	ANA-080	50	200	Southeast End	Conner Rd	150	Local	N	8			
Kivi Cres	ANA-081	0	109	Barkley Rd	North End	109	Local	N	8			
Leonie Creek Rd	ANA-082	0	240	Barriere Lakes Rd	Pavement Change	240	Local	N	7			
Leonie Creek Rd	ANA-083	240	435	Pavement Change	Pavement Change	195	Local	N	7			
Leonie Creek Rd	ANA-084	435	608	Pavement Change	Section Break	173	Local	N	7			
Leonie Creek Rd	ANA-085	608	850	Section Break	East End	242	Local	N	7			
Lilley Rd	ANA-086	0	100	Railway Ave	Borthwick Ave	100	Road	N	7	2024	OL_50	$26,230
Lilley Rd	ANA-087	100	242	Borthwick Ave	Barriere Town Rd / Hwy 5	142	Local	N	7	2036	FDM	$49,700
Lodgepole Rd	ANA-088	0	309	Barriere Lakes Rd	Northwest End	309	Local	N	8			
McLean Rd	ANA-089	0	238	Barriere Town Rd / Deejay Rd	Siska Dr	238	Local	N	7			
McLean Rd	ANA-090	238	525	Siska Dr	Annesty Rd	287	Local	N	7			
McLean Rd	ANA-091	525	735	Annesty Rd	Pavement Change	210	Local	N	7			
McLean Rd	ANA-092	735	845	Pavement Change	North End	110	Local	N	7			
Mountain Rd	ANA-093	0	337	Hwy 5 / Newberry Rd	Section Break	337	Local	N	7	2035	FDM	$117,950
Mountain Rd	ANA-094	337	530	Section Break	Pavement Change	193	Local	N	7			
Mountain Rd	ANA-095	530	814	Pavement Change	Dunsmuir Rd	284	Local	N	7	2042	FDM	$99,400
Mountain Rd	ANA-096	814	1185	Dunsmuir Rd	Section Break	371	Local	N	7			
Mountain Rd	ANA-097	1185	1390	Section Break	Dunsmuir Rd	205	Local	N	7			
Newberry Rd	ANA-098	0	79	Southwest End	Hwy 5 / Mountain Rd	79	Local	N	8			
Old Sawmill Crt	ANA-099	0	222	Agate Bay Rd	East End	222	Local	N	10			
Oriole Way	ANA-100	0	400	Deejay Rd	Section Break	400	Local	N	7			

Road Name	Analysis ID	From	To	From Street	To Street	Length (m)	Road Class	Curb	Width (m)	Treatment Year	Treatment Type	Treatment Cost
Oriole Way	ANA-101	400	645	Section Break	Deejay Rd	245	Local	N	7	2023	OL_50	$51,598
Oriole Way	ANA-102	645	905	Deejay Rd	Section Break	260	Local	N	7			
Oriole Way	ANA-103	905	1245	Section Break	Southwest End	340	Local	N	7	2024	OL_50	$65,899
Power Rd	ANA-104	0	430	Mountain Rd	Power Rd	430	Local	N	7			
Power Rd_1	ANA-105	0	167	Power Rd	Power Rd	167	Local	N	6			
Power Rd_2	ANA-106	0	232	Power Rd	Power Rd	232	Local	N	6			
Power Rd_2	ANA-107	232	329	Power Rd	East End	97	Local	N	6	2025	OL_50	$19,725
Robin Dr	ANA-108	0	270	Oriole Way	Deejay Rd	270	Local	N	7	2039	FDM	$94,500
Robin Dr	ANA-109	270	596	Deejay Rd	Gibbs Rd	326	Local	N	7	2037	OL_50	$76,744
Russell St	ANA-110	124	199	West End	Hwy 5	75	Local	N	10	2023	OL_50	$21,617
Salle Rd	ANA-111	0	159	Barkley Rd / Barriere Town Rd	East End	159	Local	N	7			
Saul Rd	ANA-112	0	58	Bartlett Rd	North End	58	Local	N	7	2029	OL_50	$9,704
Shaver Rd	ANA-113	0	80	Barriere Town Rd	Genier Rd	80	Local	N	7	2033	OL_50	$18,897
Siska Dr	ANA-114	0	242	McLean Rd	Northeast End	242	Local	N	7			
Spruce Cres	ANA-115	0	289	South End	Bradford Rd	289	Local	N	7	2040	FDM	$101,150
Spruce Cres	ANA-116	289	450	Bradford Rd	Section Break	161	Local	N	7			
Spruce Cres	ANA-117	450	789	Section Break	Birch Lane	339	Local	N	7			
Staines Rd	ANA-118	0	198	Haggard Rd	East End	198	Local	N	6			
Station Rd	ANA-119	0	135	Railway Ave	Conner Rd	135	Local	N	7	2030	OL_50	$27,138
Station Rd	ANA-120	135	423	Conner Rd	Barriere Town Rd	288	Local	N	7			
Summer Rd	ANA-121	0	152	Deejay Rd	Section Break	152	Local	N	6	2034	OL_50	$31,680
Summer Rd	ANA-122	152	405	Section Break	East End	253	Local	N	6	2040	OL_50	$47,432
Summers Rd	ANA-123	0	64	Barriere Lakes Rd	Northwest End	64	Local	N	8			
turning lane_1	ANA-124	0	167	Hwy 5	Agate Bay Rd	167	Local	R	4			
turning lane_2	ANA-125	0	71	Agate Bay Rd	Hwy 5	71	Local	R	4	2042	Mill_50	$10,261
Yard Rd	ANA-126	0	228	Southeast End	Station Rd	228	Local	N	8	2037	OL_50	$71,028
Yard Rd	ANA-127	228	588	Station Rd	Northwest End	360	Local	N	8			