a division of Englobe

Final Report for:

CITY OF FORT SASKATCHEWAN ALBERTA

Neighbourhood Rehabilitation Study

Date: December 7, 2023
Project No. 5381-007-00

Proud of Our Past... Building the Future

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December 7, 2023
File: N:\5381\007-00\FR01

Attention: Joey Farebrother, C.E.T.
Senior Engineering Coordinator

Dear Joey:

Re: City of Fort Saskatchewan
Neighbourhood Rehabilitation Study

MPE a division of Englobe is pleased to submit a digital copy of the above referenced Final Report.

We thank you for the opportunity to be of service and to have prepared this report on your behalf. We look forward to assisting the City of Fort Saskatchewan in implementing their plans for the future. If you have any inquiries regarding our report, or if clarification is required, please contact the undersigned at skusalik@mpe.ca.

Yours truly,

MPE a division of Englobe

Scott Kusalik, P.Eng.
Project Manager

Enclosure

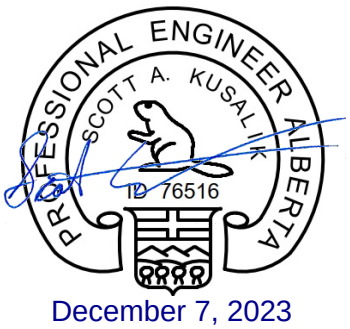
CORPORATE AUTHORIZATION

This report has been prepared by MPE a division of Englobe under authorization of the City of Fort Saskatchewan. The material in this report represents the best judgment of MPE a division of Englobe given the available information. Any use that a third party makes of this report, or reliance on or decisions made based upon it is the responsibility of the third party. MPE a division of Englobe accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based upon this report.

Should any questions arise regarding content of this report, please contact the undersigned.

MPE a division of Englobe

Professional Stamp



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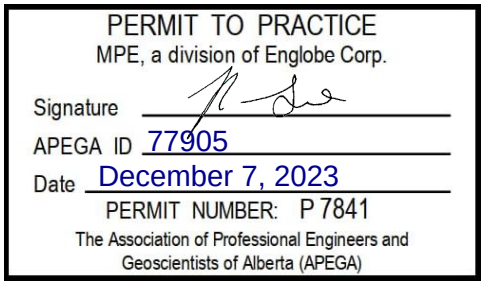

Scott Kusalik, P.Eng.

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Corporate Permit

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1.0 INTRODUCTION

1.1 Overview

The City of Fort Saskatchewan (City) requires a guiding document on how neighbourhood infrastructure replacement is selected, and the annual funding requirements to complete lifecycle replacement in a timely manner. This study will provide the City with a framework that assists in prioritizing projects, timelines to complete the projects, and the annual funding requirements to complete each project without creating a backlog. The City has commissioned MPE a division of Englobe (MPE) to prepare this document.

1.2 Study Scope

The focus of this study is to:

- Review existing infrastructure data currently available from the City.
- Identify any missing data required to complete assessment of neighbourhood infrastructure.
- Develop a decision matrix for ranking and assessing neighbourhood infrastructure condition.
- Use the decision matrix to complete a detailed assessment of the Old Fort/Sherridon areas and prepare a 10-year Capital Plan.
- Prepare a cost estimate for the Old Fort/Sherridon plan and compare to the existing funding levels provided by the City.
- Complete a 75-year lifecycle analysis of the City's neighbourhood infrastructure and develop a timeline for completing each area.
- Prepare budget figures of annual funding required to rehabilitate the City's neighbourhood infrastructure over the 75-year lifecycle.
- Review technologies, opportunities, strategies, methods, etc. that could extend the lifecycle of infrastructure, and provide potential benefits of implementing.

1.3 Objective

The objective of this study is to:

1. Evaluate the condition of the City's key infrastructure in the Old Fort/Sherridon Neighbourhoods and provide an objective ranking to determine the order, type, extent, and cost of rehabilitation required to complete updating of these neighbourhoods. MPE developed a 10-Year Capital Plan to summarize all required rehabilitation including cost estimates. The 10-Year Capital Plan will require updating as new and missing data is obtained by the City.
2. Provide the cost of rehabilitation required to complete updating of all neighbourhoods within City limits. A high-level 75-Year Lifecycle Assessment was developed to summarize the total amount of work required and the overall cost to keep all underground infrastructure on a 75-year replacement schedule.

1.4 Acknowledgements

MPE gratefully acknowledges the City of Fort Saskatchewan for their assistance on this project.

2.0 DECISION MATRIX

2.1 Overview

MPE created a decision matrix using a points system to rank the overall condition of neighbourhood infrastructure. Points were assigned to different neighbourhood infrastructure depending on various categories and their respective weightings to determine an overall score. The higher the overall score, the higher the rehabilitation priority. MPE used this matrix to determine a 10-Year Capital Plan for the Old Fort and Sherridon Neighbourhoods. MPE provided the decision matrix in Excel format to the City.

2.2 Neighbourhood Infrastructure

The neighborhood infrastructure in the decision matrix included roadways, water distribution, sanitary sewer, and storm drainage systems. These four key pieces of infrastructure were each given a weighting towards the final overall score which will determine how the rehabilitation occurs. The road segments used in the 2021 Pavement Condition Report were used to create the different projects. MPE assessed the roadway, water distribution, sanitary sewer, and storm drainage systems of each road segment to provide the overall project score. Additionally, there are two categories that consider condition and non-condition related infrastructure rehabilitation and/or improvements. These categories will allow the City to assign additional points based on the severity of condition related infrastructure issues/complaints that arise and based on the importance of non-condition related infrastructure improvements. By assigning additional points, the project will move up in priority which will allow the City to address these condition and non-condition related issues and/or improvements in a timely fashion. These categories are discussed in Sections 2.4.5 and 2.4.6.

2.3 Infrastructure Categories

Table 2.1 below explains the infrastructure type, categories, weighting, and total score used in the decision matrix.

Table 2.1: Infrastructure Type, Categories, Weighting and Total Score

Infrastructure Type	Infrastructure Categories	Weighting	Category Score	Total Score
Roadway	Sidewalk Concrete Condition	10%	7.5	75
	PQI (Pavement Quality Index)	90%	67.5	
Water	Expected Remaining Service Life	50%	50	100
	Pipe Size	30%	30	
	Fire Flow Availability	20%	20	
Sanitary	Expected Remaining Service Life	20%	20	100
	CCTV Structural Rating	40%	40	
	Pipe Size	30%	30	
	Flow Capacity Rating	10%	10	
Storm	Expected Remaining Service Life	20%	20	100
	CCTV Structural Rating	45%	45	
	Pipe Size	35%	35	
	Flow Capacity Rating	0%	0	

2.4 Scoring System

2.4.1 Roads

The scoring system for roads is weighted 90% by the pavement quality index (PQI) and 10% by sidewalk concrete condition. 75 total points are assigned to this category with 67.5 points towards the PQI and 7.5 points towards the sidewalk concrete condition. The PQI infrastructure score out of 67.5 is determined using Table 2.2 below.

Table 2.2: PQI Scoring

PQI Scoring	
PQI	Scoring
PQI ≥ 6.5	(PQI Category Score)-(PQI/10)*(PQI Category Score)
4.5 ≤ PQI < 6.5	0.8*(PQI Category Score)
2.5 ≤ PQI < 4.5	0.9*(PQI Category Score)
0 ≤ PQI < 2.5	(PQI Category Score)

The sidewalk concrete condition score out of 7.5 is determined by using the severity ratings. The ratings assigned to each data point contained within an element ID include low, moderate, and high. The severity ratings of low, moderate, and high were assigned 1, 5, and 10 points, respectively. These scores were then multiplied by how many data points contain each severity rating and then summed together to provide a total score. This total score is then divided by the total length of sidewalk and multiplied by 100 to get a score per 100 m which will help equate shorter sections to longer sections of sidewalk. The sidewalk concrete condition criteria and scoring are provided in Table 2.3.

Table 2.3: Sidewalk Concrete Condition Scoring

Sidewalk Concrete Condition Scoring	
Score Per 100m	Percent of Sidewalk Concrete Condition Weight
0	0% (0 Points)
0 < x ≤ 15	33% (2.5 Points)
15 < x ≤ 30	66% (5 Points)
x > 30	100% (7.5 Points)

2.4.2 Water

The scoring system for water is determined by expected remaining service life (ERSL), pipe size, and fire flow availability with weightings of 50%, 30%, and 20%, respectively. The ERSL score is determined by identifying the pipe material and determining the expected service life associated with that material. The total years in service is then determined and subtracted from the expected service life to get the ERSL. If the ERSL reaches zero it is assigned the max weighting. If the ERSL is above zero, then the score is calculated by Equation 1 on the following page.

$$ERSL\ Overall\ Score = (ERSL\ Category\ Score) - \frac{ERSL}{100} * (ERSL\ Category\ Score) \quad (1)$$

This equation is designed for a maximum pipe service life of 100 years. Currently, all pipe materials are given a service life of 75 years, but as the City collects more information they can adjust the decision matrix by updating the expected service life for each pipe type. A table is provided above the decision matrix where this adjustment can be made.

The pipe is scored according to size. The larger the pipe the higher priority in the matrix. To simplify the scoring, pipe size intervals were created and given a weighting that will determine the overall score of this category. This is illustrated in Table 2.4.

Table 2.4: Water Pipe Size Weightings

Water Pipe Size Ranges	
Pipe Size (mm)	Percent of Pipe size Weight
x ≤ 150	33%
150 < x < 300	67%
x ≥ 300	100%

The fire flow availability from the 2022 Hydraulic model is assigned to each watermain and scored according to the following table. A rating of 0 to 4 is given to each project which will determine how much of the fire flow weighting is assigned. The fire flow availability criteria and weightings are provided in Table 2.5.

Table 2.5: Fire Flow Availability Scoring

Fire Flow Availability Scoring		
Rating	Criteria	Percent Of Fire Flow Weighting
0	Exceeds Requirements	0%
1	80%-100% Availability	25%
2	60%-80% Availability	50%
3	40%-60% Availability	75%
4	0%-40% Availability	100%

2.4.3 Sanitary

The scoring system for sanitary is determined by ERSL, NASSCO PACP structural rating, pipe size, and flow capacity rating with weightings of 20%, 40%, 30%, and 10%, respectively. The sanitary ERSL score is determined in the same manner as the water ERSL score. Please refer to Equation 1 in Section 2.4.2. NASSCO PACP structural ratings for the structural condition of the pipe range from 0 to 5. These ratings are weighted by dividing the assigned rating by 5 and multiplying by the weighting of the NASSCO PACP structural rating category.

The sanitary pipe size is scored in the same manner as the water pipe size except it has different intervals in which points are assigned. This is illustrated in Table 2.6.

Table 2.6: Sanitary Pipe Size Weightings

Sanitary Pipe Size Ranges	
Pipe Size (mm)	Percent of Pipe Size Weight
x ≤ 200	33%
250 ≤ x ≤ 300	67%
x ≥ 375	100%

The flow capacity from the Flow Monitoring Study completed in 2020 is assigned to each sanitary main and scored according to the table below. A rating of 0 to 3 is given to each project which will determine how much of the flow capacity weighting is assigned to the score. Table 2.7 shows how the flow capacity is scored.

Table 2.7: Flow Capacity Scoring

Flow Capacity Scoring		
Rating	Criteria	Percent of Flow Capacity Weight
0	0%-50% Pipe Utilization or No Data	0%
1	50%-86% Pipe Utilization	33%
2	86%-150% Pipe Utilization	67%
3	150% Pipe Utilization	100%

2.4.4 Storm

The scoring system for storm is determined by ERSL, NASSCO PACP structural rating, pipe size, and flow capacity rating with weightings of 20%, 45%, 35%, and 0%, respectively. The flow capacity is given a weighting of 0% because there is no current data on this category. Once a flow capacity study is completed the weightings will change to 20%, 40%, 30%, and 10% for ERSL, CCTV, pipe size, and flow capacity, respectively.

The storm ERSL score is determined in the same manner as the water and sanitary ERSL scores. Please refer to Equation 1 in Section 2.4.2. NASSCO PACP structural ratings for the condition of the pipe range from 0 to 5. These ratings are weighted by dividing the assigned rating by 5 and multiplying by the weighting of the NASSCO PACP structural rating category.

The storm pipe size is scored in the same way as the water and sanitary pipe size except it has different intervals in which points are assigned. This is illustrated in Table 2.8 on the following page.

Table 2.8: Storm Pipe Size Weightings

Storm Pipe Size Ranges	
Pipe Size (mm)	Percent of Pipe Size Weight
x ≤ 375	33%
450 ≤ x ≤ 525	67%
x ≥ 600	100%

Flow capacity will be scored in the same way as the sanitary flow capacity. Refer to Section 2.4.3 for an explanation.

2.4.5 Condition Related Infrastructure Issues/Complaints

At the request of the City, a category was added to account for issues or complaints that can be physically measured. This category is scored by assigning additional points up to a total of 100. These additional points will be added to the overall infrastructure score up to a maximum overall project score of 100. The assigning of points is at the Engineers discretion. Table 2.9 provides the criteria of how a rating is given.

Table 2.9: Condition Related Infrastructure Issues/Complaints Scale and Scoring

Severity Scale			
Rating	Description	Criteria	Additional Scoring
1	Low	Minor nuisance. Issue has little impact on condition.	Engineers Discretion
2	Moderate	Gradual performance degradation. Issue to be resolved in 5 years or more.	Engineers Discretion
3	High	Operable at reduced performance. Issue to be resolved in 2 years to 5 years.	Engineers Discretion

2.4.6 Non-Condition Related Infrastructure Improvements

A category in the matrix was added to account for non-condition related infrastructure improvements at the request of the City. This category helps to move up a project's priority for reasons other than the condition of the existing infrastructure. The rating for this category is subjective and is determined by the City. It is scored according to an importance scale. Table 2.10 below provides how the ratings are determined.

Table 2.10: Non-Condition Related Infrastructure Improvements Scale

Importance Scale		
Rating	Description	Additional Scoring
1	Low Importance	Engineers Discretion
2	Moderate Importance	Engineers Discretion
3	High Importance	Engineers Discretion

2.4.7 Individual and Overall Utility Scores

The utility score for each key piece of infrastructure is a weighted average of only the scoring that is available. For example, if a roadway has a PQI score and no sidewalk concrete condition score then the entirety of the roadway score will be based solely on the PQI. The total roadway score must remain out of 75 to ensure the weighted average between each infrastructure remains the same. To illustrate this an example is provided below.

Ex.) The section with no sidewalk has a PQI of 6.4. The PQI would provide a score of 54 out of a total possible of 67.5. To maintain the weighted average, the 54 is divided by the 67.5 and multiplied by 75 to get the actual score of the roadway section. This would give an overall score of 60 out of 75.

The overall infrastructure score for each section is calculated in a similar fashion. It is a weighted average of only the utilities that have scoring available. If the section only contains road and water utilities, then the score is out of a total of 175 instead of the possible 375 available points. The score is then multiplied by 100 to get an overall utility score between 0 and 100.

2.4.8 Overall Project Score

The overall project score includes the overall infrastructure score and the additional points from the condition related infrastructure issues/complaints and the non-condition related infrastructure improvement categories. This score will determine the project priority. The higher the overall project score the higher the priority. The maximum overall project score is 100.

3.0 OLD FORT/SHERRIDON 10-YEAR CAPITAL PLAN

3.1 Infrastructure Upgrade Priority

MPE used the decision matrix developed in Section 2.0 to help determine upgrade priority and aid in development of the 10-Year Capital Plan. This plan will help to restore assets to a good level of service. A good level of service is one where the asset is in good condition, with no major structural, capacity, or operation issues. The results of the decision matrix are included in ***Appendix A***. Table 3.1 illustrates what is considered a good level of service for each piece of infrastructure.

Table 3.1: Good Level of Service Requirements

Infrastructure Type	Infrastructure Category	Required Score
Road	PQI (Pavement Quality Index)	> 6.5
Sidewalk	Score per 100m	< 15
Water	Fire Flow Availability	> 80%
Sanitary	Flow Capacity Pipe Utilization	< 86%
	CCTV Structural Rating	≤ 1
Storm	Flow Capacity Pipe Utilization	< 86%
	CCTV Structural Rating	≤ 1

3.2 Key Issues and Simplifications

For this 10-Year Capital Plan, assumptions and simplifications were required to allow for the decision matrix to rank projects appropriately. The decision matrix works by assigning infrastructure an element ID that corresponds with the element ID's created in the City's Pavement Condition Reports. Since element ID's were created for road segments and not for the other infrastructure being evaluated, MPE encountered some issues with the data. The issues include multiple segments of pipe with different material, install year, size, flow capacity, fire flow availability, and CCTV ratings within the same element ID. To address this issue, each infrastructure category which has multiple outputs for an element ID will have the output that will give the highest total overall score selected for ranking purposes. The higher the total overall score the higher the priority of the project.

Another issue included segments of pipe with a certain element ID extending into another element ID area or through green space areas before reaching a valve or manhole. This will cause the costing of some projects to include pipe that is not entirely contained within its road element ID. To simplify this for costing purposes, sections of pipe were assigned to the element ID that contain most of the total length of pipe.

Some data required for the decision matrix is missing. MPE has identified this missing data in the decision matrix which can be found in ***Appendix A***. MPE completed the 10-Year Capital Plan using the most recent data for each piece of infrastructure. MPE recommends completing updated assessments for the sidewalk, sanitary, and storm systems to better identify which areas require rehabilitation. Once these assessments are completed the City can update the decision matrix and generate an updated 10-Year Capital Plan.

3.3 10-Year Capital Projection Overview

MPE prepared a 10-Year Capital Projection that outlines the proposed schedule for project delivery based on the decision matrix rankings and the total estimated cost to rehabilitate the Old Fort/Sherridon Neighbourhoods. The projection outlines high-priority rehabilitation required to address issues within the infrastructure systems and return the neighbourhoods infrastructure to a good condition. In order to maintain a 75-year neighbourhood lifecycle the City must complete rehabilitation in the Old Fort/Sherridon Neighbourhood by 2045 so the City can rehabilitate subsequent neighbourhoods within the lifecycle requirement.

MPE created a 10-year capital plan based on the highest priority projects while the remaining projects were left for completion in the following ten years. MPE costed these remaining projects, but they did not include them in the 10-year capital plan. MPE recommends the City revise this plan as new data is acquired and inputted into the decision matrix. MPE also recommends that the City revise the 10-year plan as projects from the current plan are completed.

Projects identified in the 10-Year Capital Plan are outlined in ***Appendix B***. MPE has calculated approximate costs for these projects as outlined below, and our assumptions in calculating these costs are:

1. A 75-Year design life for all underground utilities.
2. In areas where storm sewer is present, MPE recommends that the City inspect the storm sewer main by CCTV prior to construction to determine condition.
3. Any storm infrastructure within 20 years of its design life is recommended for replacement.
4. MPE recommends completing sanitary sewer CCTV prior to construction to confirm pipe condition and determine rehabilitation requirements.
5. MPE has assumed roadway repairs for water, sanitary sewer, and storm sewer rehabilitation:
    - In areas where only one underground utility is rehabilitated it is assumed restoration of a 4 m wide trench, and a mill and overlay for what is remaining, unless otherwise specified in the 2021 Asset Management Update.
    - In areas where no underground utility replacement is required, the recommended road rehab from the 2021 Asset Management Update will be used.
    - Element ID shape areas (m^2) from GIS data will be used for road estimation purposes.
6. The Old Fort/Sherridon Neighbourhoods were constructed in the 1950's and 1960's which suggests that the underground infrastructure is nearing its 75-year design life. Therefore, if no installation year is known and no relining has occurred for the underground infrastructure MPE assumed that it is at its 75-year design life and the recommended rehabilitation is for removal and replacement.
7. If a CCTV structural score of zero is assigned to the sewer or storm system, then no rehabilitation is required.
8. The exact year of replacement for each type of infrastructure is not calculated. It is the overall score from the decision matrix that determines which Element ID is replaced and in what year it is scheduled for replacement. The element ID may include a combination of one or all infrastructure types for replacement or left as-is based on the different infrastructure criteria. For example, if the storm and sanitary are past their expected life but the water and road are not scheduled for replacement, and the overall score for this Element ID is over 65 then it is scheduled for replacement within the first ten years for the infrastructure that require replacement. If the same example had a score under 65 then it is scheduled for replacement from year eleven to twenty. The higher the overall score the sooner it is scheduled for rehabilitation.
9. If an underground utility is within 20 years of reaching its design life and another utility within the same element ID is needing replacement, then both utilities are recommended for replacement. The 20-year mark was chosen as a threshold to avoid having to complete another road rehabilitation to complete additional underground infrastructure within 20 years of the first rehabilitation. After 20 years have passed the roadway is likely to need repairs which will align better with replacing a separate underground utility which will lead to cost savings.
10. All underground utilities located in back alleys or outside of roadways are attached to the nearest roadway element ID. MPE costed each element ID according to the infrastructure it contains.

11. Trail rehabilitation is not included in the costing for the 10-Year Capital plan.
12. The sidewalk concrete condition score was used to determine the recommended repair for sidewalks to determine cost estimates.
    - A score of 30 or greater requires a complete reconstruct.
    - A score from 10 to 30 will require spot repairs that were assumed to be 20% of the total length of sidewalk.
    - A score of less than 10 will require no repairs.
13. Any projects that did not have underground utilities were removed from the 10-year capital plan. The City will address these projects under their local road rehabilitation program.
14. Best Engineering judgement was used to determine appropriate rehabilitation and cost where information and data is unavailable, limited, or obsolete.

The unit rates used for the rehabilitation recommendations are:

1. Roadway, Reconstruct: $236.00/m^2
2. Roadway, Full Depth Reclamation (FDR): $179.00/m^2
3. Roadway, Trench Reconstruction: $265.00/m^2
4. Roadway, Mill and Overlay 50 mm: $51.00/m^2
5. Roadway, Mill and Overlay 75 mm: $63.00/m^2
6. Roadway, Microsurfacing: $16.00/m^2
7. Sidewalk, Reconstruct: $352.00/m
8. Sidewalk, Spot Repair: $405.00/m
9. Watermain, Remove and Replace (Open Cut): $3,080.00/m
10. Watermain, Trenchless: $1,720.00/m
11. Sanitary, Remove and Replace (Open Cut): $3,230.00/m
12. Sanitary, Re-Lining: $970.00/m
13. Sanitary, Spot Repair: $3,090.00/m
14. Storm, Remove and Replace (Open Cut): $3,230.00/m
15. Storm, Re-Lining: $550.00/m
16. Storm, Spot Repair: $1,820.00/m

These unit rates include contingency (15%) and engineering (15%).

3.4 Decision Matrix

Section 2.0 discussed how the decision matrix was constructed and the weightings that each piece of infrastructure and subcategories were given to determine a final overall score. The higher the overall score the higher the priority of the project within the 10-Year Capital Plan. The decision matrix will require updating and reordering as new data is acquired regarding all infrastructure categories used to determine the total overall score. For this plan MPE used all data currently available to create the best possible 10-Year Capital Plan. Additionally, MPE grouped projects that are in proximity to one another where possible. The most updated decision matrix with overall scores is provided in ***Appendix A***.

3.4.1 Data Gaps

After inserting all available data into the decision matrix, some data gaps remain. A list of the major data gaps is below:

1. Missing flow capacity for sanitary and storm infrastructure.
2. Missing CCTV ratings for storm infrastructure.

All missing data is highlighted in ***Appendix A***. As additional data is gathered and inputted in the decision matrix the priority of each project is likely to change.

3.4.2 Summary

Using all available data, the decision matrix produced a wide range of scores from 0 to 97 for each project. Figure 3.1 is a histogram illustrating the frequency of each overall score.

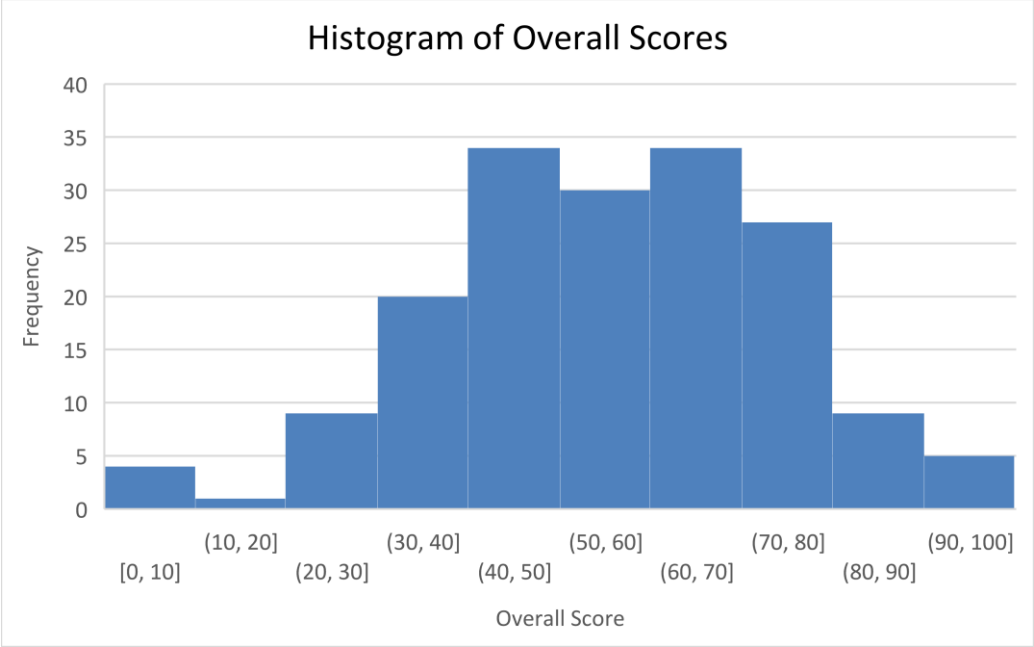


Figure 3.1: Histogram of Overall Scores

As the City collects more data and updates the decision matrix, the distribution may change. This change will then affect the execution and cost of the proposed 10-Year Capital Plan.

3.5 10-Year Capital Plan

Using the decision matrix results, MPE selected all projects requiring rehabilitation within the next 10 years to create the 10-Year Capital Plan. Projects with an overall score of 65 or greater are recommended for completion within the first 10 years while any remaining projects are recommended for completion from year 11 to year 20 of the plan. The exact year and order of projects recommended for repair after the first 10 years were not included.

In developing the plan, MPE totaled all estimated costs within the Capital Plan and distributed them as evenly as possible across the 10 years based on the overall score as mentioned in the paragraph above. This will help to determine the annual funding required for rehabilitation and help to avoid years of extremely large or small costs. Any project that is already scheduled for completion by the City in 2022 or 2023 was removed from the Capital Plan which begins in 2024. The 10-Year Capital Plan complete with estimated construction year and estimated costs for each project is provided in ***Appendix B***. A drawing is included in ***Appendix B*** to illustrate the 10-Year Capital Plan.

The City currently has a neighbourhood rehabilitation program that has funding to complete infrastructure renewal. The total funding for this program from year 2023 to year 2033 was provided. The funding level was compared with the estimated funding required to complete rehabilitation in the Old Fort/Sherridon neighbourhoods. The estimated funding was determined using a combination of overall scores, proximity, Element ID data, and infrastructure unit costs. To determine the additional budget required to complete the 10-Year Capital plan the annual total projected funding was subtracted from the estimated funding required. Table 3.2 illustrates the annual projected funding, annual estimated funding required, and the additional budget required to complete the necessary rehabilitation in a timely fashion.

Table 3.2: 10-Year Capital Plan Funding Estimates

Year	Neighbourhood Rehabilitation Funding	Estimated Funding Required	Additional Budget Required
2023	$4,300,000.00	N/A	$0.00
2024	$4,745,000.00	$6,189,000.00	$1,444,000.00
2025	$5,090,000.00	$6,104,000.00	$1,014,000.00
2026	$5,425,000.00	$6,199,000.00	$774,000.00
2027	$5,760,000.00	$6,804,000.00	$1,044,000.00
2028	$6,095,000.00	$6,886,000.00	$791,000.00
2029	$6,440,000.00	$6,787,000.00	$347,000.00
2030	$6,785,000.00	$6,787,000.00	$2,000.00
2031	$7,120,000.00	$7,342,000.00	$222,000.00
2032	$7,455,000.00	$6,549,000.00	$0.00
2033	$7,790,000.00	$5,728,000.00	$0.00
2034 - 2044	N/A	$67,203,000.00	N/A

The 10-Year Capital Plan is estimated to cost $65,375,000.00. Additional funding required from 2024 to 2031 totals $5,638,000.00 while there is an estimated surplus of $906,000.00 in 2032 and $2,062,000.00 in 2033. The remaining projects requiring completion after 2033 totals $67,203,000.00. All projects are estimated in 2023 dollars for the purpose of this assessment. The estimates were created using projects of similar scope completed in 2023 by MPE. Due to missing or outdated data, many assumptions were made to provide conservative estimated costs. As more data is acquired and analyzed the rehabilitation method may change which is likely to lower the overall costs.

Table 3.3 illustrates the annual projected funding, estimated funding, and additional budget required based on the overall scores of each Element ID and recommended years they are to be rehabilitated.

Table 3.3: 10-Year Capital Plan Funding Estimates Based on Overall Score

Year	Overall Score Range	Projected Funding	Estimated Funding Required	Additional Budget Required
2023	N/A	$4,300,000.00	N/A	$0.00
2024	x ≥ 65	$62,705,000.00	$65,375,000.00	$2,670,000.00
2025				
2026				
2027				
2028				
2029				
2030				
2031				
2032				
2033				
2034 - 2044	x < 65	N/A	$67,203,000.00	N/A

The table shows the City will need approximately $2,670,000.00 of additional budget within the first ten years of the capital plan and approximately $67,203,000.00 for the years following the 10-Year Capital Plan.

It is important to reference the GIS data when executing the 10-Year Capital Plan to visualize the exact extent of each project area since utilities are assigned to an element ID even though they may not be contained within the roadway.

For illustration purposes, MPE has included figures to show each key piece of infrastructure that was assessed. As more data is input additional figures can be generated to show all infrastructure categories that were assessed. A list of each figure that can be found in ***Appendix C*** is below:

1. Road PQI
2. Sidewalk Score per 100 m
3. Water Infrastructure Pipe Size and Material
4. Sanitary Infrastructure Pipe Size
5. Storm Infrastructure Pipe Size

4.0 CITYWIDE 75-YEAR LIFECYCLE ASSESSMENT

4.1 Infrastructure Upgrade Priority

MPE determined upgrade priority based on the age of the neighbourhoods. This Assessment will focus on completing full replacements of all surface and underground infrastructure to ensure that the infrastructure in each neighbourhood is replaced once its 75-year life expectancy is met. As the City collects more data on the life expectancy of different pipe materials, the life expectancy can be adjusted from the predicted 75 years. This will possibly extend the life expectancy and allow for completing the rehabilitation over a longer period to reduce the annual financial impacts.

For the lifecycle assessment, MPE looked at infrastructure from a neighbourhood level. The age of infrastructure in each neighbourhood was considered when determining priority. MPE did not assign element IDs to each roadway as was done to develop the 10-Year Capital Plan in Old Fort/Sherridon.

4.2 Assumptions

In preparing the Citywide 75-Year Lifecycle Assessment, MPE made the following assumptions:

- Length of sidewalk is double the road length. MPE has assumed sidewalks on both sides of the road.
- Any roads that had gravel surfaces were removed.
- Southfort Ridge Commercial and Pointe-aux-Pins are outside the original scope of the study, and are not included in this assessment.
- Total lengths of water, sanitary sewer, and storm sewer mains were included in this assessment. Lengths for service leads, hydrant leads, catchbasin leads, etc., were not included. The costs for these items were included in the unit rates for the main lines.
- The infrastructure data used in the lifecycle assessment is that provided by the City. MPE recommends that the City update this Lifecycle Assessment as infrastructure data is updated.

4.3 Citywide 75-Year Lifecycle Overview

MPE prepared a 75-year lifecycle assessment that outlines the proposed schedule for project delivery based on the age of the neighbourhoods. The figures in **Appendix D** provide the **construction decade of the neighbourhoods and neighbourhood boundaries**.

MPE assumed a 75-Year design life for all underground utilities. The data available to MPE shows that the earliest construction date is 1968 in areas within the 1970 Neighbourhood boundaries. There is also a 1963 construction date in the Sherridon Extension 1970 neighbourhood. Following discussions with the City, MPE will consider the rehabilitation date for the Citywide assessment to start within the 1970 Neighbourhood Boundaries such as Pineview, McNichol, and Chamberlain. With the earliest construction date in these neighbourhoods of 1968, rehabilitation is required to start in 2043 based on a 75-year design life.

To determine the overall costs for rehabilitating the surface and underground infrastructure, MPE used the unit rates below:

- Roadway, Reconstruct: $236.00/m^2
- Sidewalk, Reconstruct: $352.00/m
- Watermain, Remove and Replace (Open Cut): $3,080.00/m
- Sanitary, Remove and Replace (Open Cut): $3,230.00/m
- Storm, Remove and Replace (Open Cut): $3,110.00/m

These unit rates include contingency (15%) and engineering (15%).

4.4 Lifecycle Assessment

MPE prepared a 10-year Capital Plan for the Old Fort and Sherridon neighbourhoods. The decades of construction for those areas were the 1950s and 1960s. Outside of those areas, MPE recommends that the rehabilitation in the 1970s Neighbourhoods start in 2043 based on the earliest construction date.

To determine rehabilitation costs, MPE extracted roadway area, sidewalk length, watermain length, sanitary sewer main length, and storm sewer length for each neighbourhood. MPE used the unit rates above to determine a total estimated rehabilitation cost for each neighbourhood. The total neighbourhood costs were then combined into construction decade to determine the total cost for each decade. These costs are provided in Table 4.1 below.

The costs provided for the 1950s and 1960s in Table 4.1 are from the 10-Year Capital Plan in Old Fort/Sherridon.

Table 4.1: Rehabilitation Costs by Construction Decade

Construction Decade	Total Cost (2023 Dollars)
1950s	$77,077,000.00
1960s	$55,501,000.00
1970s	$317,916,000.00
1980s	$77,649,200.00
1990s	$121,656,000.00
2000s	$343,631,000.00
2010s	$246,125,000.00
TOTAL REHABILITATION COST	**$1,239,555,200.00**

The costs provided in Table 4.1 are in 2023 dollars. MPE recommends that the City update these costs as the rehabilitation date approaches. MPE has assumed full rehabilitation of surface and underground infrastructure for each neighbourhood. As the rehabilitation date approaches, MPE recommends the City evaluate the condition of each infrastructure segment to determine if full rehabilitation is required.

If the City starts a 75-year replacement in Old Fort/Sherridon in 2024 the annual cost in 2023 dollars to complete the rehabilitation over the timeframe is approximately $16,528,000.00.

4.5 Sanitary Trunk

The City has a sanitary trunk in the North Saskatchewan River Valley that runs to the west of Downtown, Fort Centre, and Bridgeview. The trunk crosses under Highway 15 before connecting into the Chamberlain neighbourhood. Information available to MPE shows the installation of the first part of the trunk in 1965, with the remaining connection completed in 1970. Part of the trunk was twinned in 1975. This trunk is outside any neighbourhoods, so the costs are not included in Table 4.1 above.

Assuming a 75-year design life places a rehabilitation date of the 1965 portion of the trunk in 2040. Using the unit rates from Section 2.0 provides rehabilitations cost of:

- 1965 installation: $2,876,000.00
- 1970 installation: $3,113,000.00
- 1975 twinning: $2,889,000.00

All costs are in 2023 dollars. MPE recommends that the City plan for the rehabilitation of this trunk starting in 2040. The *City of Fort Saskatchewan, Sanitary Sewer Flow Monitoring Program and Inflow and Infiltration Assessment, March 2020* (Flow Monitoring Program) showed that this trunk still has capacity during wet weather flow events in current conditions. Prior to rehabilitation of this sanitary sewer trunk, MPE recommends that the City determine if any capacity upgrades are required for this trunk to accommodate future growth.

5.0 EXTENSION OF INFRASTRUCTURE LIFECYCLE

The life expectancy of newer pipe materials such as PVC is uncertain. Some PVC pipe manufacturers list a minimum service life of 100 years instead of the 75 years used in this study. As discussed in Section 4.0, as the City collects more data on the life expectancy of different pipe materials, the City can adjust the life expectancy from the predicted 75 years used in the 10-Year Capital Plan and Citywide Assessment. This will possibly extend the life expectancy and allow for completing the rehabilitation over a longer period to reduce the annual financial impacts.

The City can look at other technologies to rehabilitate infrastructure. The City is already relining storm and sanitary sewer mains. This trenchless technology extends the service life of the existing mains and removes the requirement for excavated rehabilitation. Other technologies to consider include:

- Pipe bursting of watermains in areas where there are minimal services. This trenchless technology would reduce the excavation required for replacement.
- Relining of sanitary and storm manholes to extend the service life of these pieces of infrastructure.
- Full-depth reclamation of gravel base and asphalt on roadways creating a rehabilitated road structure by recycling the existing materials in-place and adding foamed asphalt.

The City can also look at strategies in development to reduce the impact of development on the existing water, storm drainage, and sanitary sewer infrastructure. For sanitary sewer infrastructure this would include implementing water conservation measures and reducing inflow and infiltration to make room for growth. For storm sewer infrastructure, this would include slowing water from entering the existing drainage network through implementing storage and Low Impact Development infrastructure.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Decision Matrix

Conclusions and Recommendations from the decision matrix are:

1. The infrastructure types utilized in the decision matrix included roadway, water distribution, sanitary sewer, and storm drainage systems. Each type was given a weighting towards the overall infrastructure score.
2. Each infrastructure type was assigned different categories that were weighted and scored to provide individual infrastructure scores. The different categories were based on data provided by the City.
3. The condition related infrastructure issues/complaints and the non-condition related infrastructure improvements categories were included at the request of the City. These categories will help to increase project priority when issues arise, or improvements are needed. Using the specified criteria, a rating and additional points are assigned according to the Engineer's discretion.

6.2 10-Year Capital Plan

The methodology and assumptions used in developing the plan are:

1. MPE and the City created a decision matrix that evaluated various infrastructure attributes within the Old Fort and Sherridon Neighbourhoods. All key pieces of infrastructure were tied to an Element ID to create projects. The decision matrix produced an overall score for each project that were ranked from 0 to 100. The higher the score the higher the priority. The decision matrix results are provided in ***Appendix A***.
2. Using the decision matrix results and project proximity, MPE created a 10-Year Capital Plan to help the City restore their infrastructure to a good level of service and bring the Neighbourhoods up to date. This plan involved determining the type, extent, and cost of rehabilitation work for each project that is required based on available data. The plan along with a map is included in ***Appendix B***.
3. The type, extent, and cost of each project was determined using available data only. Many assumptions and simplifications were also required to allow for determining rehabilitation costs.

The conclusions and recommendations of the plan are:

1. A current estimate to complete all required rehabilitation from 2024 to 2033 is approximately $65,375,000.00. MPE has split this cost as evenly as possible over 10 years to determine the additional funding requirements to complete the rehabilitation. The remaining projects that require rehabilitation in years following the 10-Year Capital Plan are estimated to cost $67,203,000.00. The City currently has one funding stream for neighbourhood rehabilitation with projected budgets up to 2033. When subtracting the annual projected funding from the estimated required funding it was determined that the City will need an additional $2,670,000.00 from 2024 to 2033. Table 6.1 illustrates the annual cost and funding projections similar to Table 3.2 in Section 3.5.

Table 6.1: Annual Cost and Funding Projections

Year	Neighbourhood Rehabilitation Funding	Estimated Funding Required	Additional Budget Required
2023	$4,300,000.00	N/A	$0.00
2024	$4,745,000.00	$6,189,000.00	$1,444,000.00
2025	$5,090,000.00	$6,104,000.00	$1,014,000.00
2026	$5,425,000.00	$6,199,000.00	$774,000.00
2027	$5,760,000.00	$6,804,000.00	$1,044,000.00
2028	$6,095,000.00	$6,886,000.00	$791,000.00
2029	$6,440,000.00	$6,787,000.00	$347,000.00
2030	$6,785,000.00	$6,787,000.00	$2,000.00
2031	$7,120,000.00	$7,342,000.00	$222,000.00
2032	$7,455,000.00	$6,549,000.00	$0.00
2033	$7,790,000.00	$5,728,000.00	$0.00
2034-2044	N/A	$67,203,000.00	N/A

2. Local road rehabilitation is required after the completion of the 10-Year Capital Plan since the expected service life of roads are much shorter than underground infrastructure. MPE recommends that the City continue to use the yearly pavement condition reports and recommendations to determine required road rehabilitation completed past 2033.

6.3 Citywide 75-Year Lifecycle Assessment

The conclusions and recommendations of the citywide assessment are:

1. MPE determined the upgrade priority based on the age of the neighbourhoods. This assessment focuses on completing full replacement of all surface and underground infrastructure to ensure that the infrastructure in each neighbourhood is replaced once its 75-year life expectancy is met. As the City collects more data on the life expectancy of different pipe materials, the life expectancy can be adjusted from the predicted 75 years. This may extend the life expectancy and allow for rehabilitation completion over a longer period to reduce the annual financial impacts.

2. MPE looked at infrastructure from a neighbourhood level. The age of infrastructure in each neighbourhood was considered when determining priority. MPE did not assign element IDs to each roadway as was done to develop the 10-Year Capital Plan in Old Fort/Sherridon.

3. MPE used data from the City to determine the earliest construction date outside of the Old Fort and Sherridon neighbourhoods. The data available to MPE shows that the earliest construction date is 1968 in areas within the 1970 Neighbourhood boundaries. There is also a 1963 construction date in the Sherridon Extension 1970 neighbourhood. Based on the 75-year design life, MPE recommends construction start in 1970 Neighbourhoods in 2043.

4. MPE determined the total citywide construction costs for each neighbourhood. MPE then combined these costs into construction decade to determine the costs for each decade. These costs in 2023 dollars are shown in Table 6.2. The costs provided for the 1950s and 1960s come from the 10-Year Capital Plan in Old Fort/Sherridon.

Table 6.2: Rehabilitation Costs by Construction Decade

Construction Decade	Total Cost (2023 Dollars)
1950s	$77,077,000.00
1960s	$55,501,000.00
1970s	$317,916,000.00
1980s	$77,649,200.00
1990s	$121,656,000.00
2000s	$343,631,000.00
2010s	$246,125,000.00
TOTAL REHABILITATION COST	$1,239,555,200.00

MPE recommends that the City update these costs as the rehabilitation date approaches. MPE has assumed full rehabilitation of surface and underground infrastructure for each neighbourhood. As the rehabilitation date approaches, MPE recommends the City evaluate the condition of each infrastructure segment to determine if full rehabilitation is required.

If the City starts a 75-year replacement program in Old Fort/Sherridon in 2024 the annual cost in 2023 dollars to complete the rehabilitation over the timeframe is approximately $16,528,000.00.

5. The City has a sanitary trunk in the river valley that runs to the west of Downtown, Fort Centre, and Bridgeview. Information available to MPE shows the installation of the first part of the trunk in 1965, with the remaining connection completed in 1970. Part of the trunk was twinned in 1975.

Assuming a 75-year design life places a rehabilitation date of the 1965 portion of the trunk in 2040. Using the unit rates from Section 2.0 provides rehabilitation costs of:

- 1965 installation: $2,876,000.00
- 1970 installation: $3,113,000.00
- 1975 twinning: $2,889,000.00

MPE recommends that the City plan for the rehabilitation of this trunk starting in 2040. The Flow Monitoring Program showed that this trunk still has capacity during wet weather flow events in current conditions. Prior to rehabilitation of this sanitary sewer trunk, MPE recommends that the City determine if any capacity upgrades are required for this trunk to accommodate future growth.

APPENDIX A

Decision Matrix

a division of Englobe

									Asset	ROAD		WATER					
									Criterion	Sidewalk Condition (Score per 100 m)	PQI	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	Pipe Size (mm)	Fire Flow Availability	Fire Flow Availability Rating
									Points Assigned	7.5	67.5	0	0	50	30	0	20
Project Priority	Element ID	Road	From	To	Neighbourhood	Length (m)	Width (m)	Class									
1	0008-0020	102 ST			Downtown								PVC	0	300		
2	0010-0020	103 ST			Downtown								PVC	0	300		
3	0011-0020	104 ST			Downtown								PVC	0	300		
4	0078-0160	98 AV	103 ST	104 ST	Downtown	86.0	8.7	COL		15	0.1						
5	0078-0170	98 AV	104 ST	ROCQUE DR	Downtown	120.0	8.8	COL		6	1.1						
6	0016-0010	108A ST	98 AV	112 ST / 99 AV	Downtown	185.0	7.8	LOC			4.5						
7	0069-0010	95 ST SB to HWY 15 NB ramp	94 AV	HWY 15 NB	Sherridon	129.7	7.8	HWY			2.6						
8	0182-0010	SHERRIDON DR 1	SHERRIDON DR	96A AV	Sherridon	51.0	5.1	COL		16	2.5						
9	0002-0040	100 ST			Sherridon								AC	0	200		
10	0002-0020	100 ST	96 AV	96A AV	Sherridon	99.0	10.6	LOC		7	4.6						
11	0078-0180	98 AV	ROCQUE DR	ROSS DR	Downtown	189.0	9.2	COL		8	2.4						
12	0078-0130	98 AV	98 AV 1	102 ST	Downtown	56.0	8.5	COL		54	0.8						
13	0163-0010	RIVER RD	101 ST	104 ST	Old Fort	222.0	9.2	LOC			3.5	1965	AC	17	150	60%	3
14	0011-0050	104 ST	103 ST	RIVER RD	Old Fort	203.0	11.7	LOC		21	3.9		AC	0	150	60%	3
15	0006-0020	101A ST	97 AV	Northwest End	Ross Creek Park	33.0	5.8	LOC			5.8						
16	0015-0020	108 ST			Old Fort								PVC	0	200		
17	0064-0160	94 AV	95 ST 1	96 ST	Sherridon	106.0	11.1	LOC		18	4.8						
18	0064-0170	94 AV	96 ST	97 ST	Sherridon	99.0	10.8	LOC		30	5.0						
19	0064-0180	94 AV	97 ST	98 ST	Sherridon	106.0	10.8	LOC		19	5.9						
20	0086-0010	99 ST	South End	95 AV	Sherridon	104.0	10.3	LOC		24	4.6						
21	0009-0010	103 AV	109 ST	Northeast End	Old Fort	64.0	7.4	LOC			5.9	1953	CI	5	150	40%	4
22	0081-0180	99 AV	102 ST	103 ST	Downtown	88.0	7.4	ART		9	3.4	1989	PVC	41	450	100%	0
23	0083-0020	99 AV 2	103 ST	102 ST	Downtown	88.0	4.4	LOC		11	3.1	1951	CI	3	150	100%	0
24	0017-0050	109 ST	100 AV	101 AV	Old Fort	153.0	11.1	LOC		27	6.3		Unknown	0	50	60%	3
25	0067-0010	95 ST	94 AV	96 AV	Sherridon	251.0	10.8	ART		6	5.7	1989	PVC	41	450	100%	0
26	0083-0010	99 AV 2	104 ST	103 ST	Downtown	86.0	4.2	LOC		10	5.1	1951	CI	3	150	100%	0
27	0084-0020	99 AV 3	107 ST	108 ST	Old Fort	101.0	8.6	LOC		8	4.2						
28	0014-0040	107 ST	102 AV	Northwest End	Old Fort	81.0	8.7	LOC		9	3.9	1952	CI	4	150	80%	2
29	0140-0010	HWY 15 NB to 95 ST NB ramp	HWY 15 NB	94 AV		117.2	6.8	HWY		0	4.9	1989	PVC	41	450	100%	0
30	0084-0010	99 AV 3	106 ST	107 ST	Downtown	87.0	9.1	LOC		35	4.4						
31	0078-0190	98 AV	ROSS DR	108 ST / LOWE AV	Downtown	65.0	8.4	COL		2	4.3	2001	PVC	53	300	100%	0
32	0005-0080	101 ST	96A AV	97 AV		86.0	12.3	ART				1951	CI	3	200	100%	0
33	0078-0200	98 AV	LOWE AV	Northeast End	Downtown	61.0	8.4	LOC		8	5.3	1970	AC	22	200	100%	0
34	0067-0020	95 ST	96 AV	99 AV	Sherridon	116.0	9.5	ART		0	3.6	1989	PVC	41	450	100%	0
35	0084-0040	99 AV 3	109 ST	Northeast End	Old Fort	60.0	10.4	LOC			2.9	2014	PVC	66	450	100%	0
36	0081-0110	99 AV	CENTRE OF HWY 15 O/P	94 ST	Sherridon	173.0	10.7	ART			5.0	1973	AC	25	300	100%	0
37	0013-0020	106 ST	100 AV	101 AV	Old Fort	154.0	10.6	LOC		30	2.2	1951	CI	3	100	60%	3
38	0181-0050	SHERRIDON DR			Sherridon					8			AC	0	200		
39	0075-0110	97 AV	97 ST	98 ST	Sherridon	50.0	12.3	LOC		18	4.4	1965	AC	17	150	100%	0
40	0082-0020	99 AV 1	SHERRIDON DR	100 ST	Sherridon	179.0	8.2	LOC		8	4.2	1963	AC	15	200	100%	0
41	0012-0020	105 ST	101 AV	102 AV	Old Fort	107.0	11.2	LOC		10	4.0	1951	CI	3	150	100%	0
42	0163-0020	RIVER RD	104 ST	PCH	Old Fort	755.7	6.9	LOC			6.8	1970	AC	22	200	40%	4
43	0084-0030	99 AV 3	108 ST	109 ST	Old Fort	103.0	8.7	LOC		11	4.4	1953	CI	5	150	100%	0
44	0011-0040	104 ST	100 AV	101 AV	Downtown	153.0	12.2	LOC		20	3.3	1952	CI	4	100	60%	3
45	0078-0140	98 AV	102 ST	103 ST	Downtown	88.0	7.9	COL		20	0.5	2001	PVC	53	300	100%	0
46	0081-0140	99 AV	SHERRIDON DR	100 ST	Sherridon	262.0	9	ART		1	6.3	1989	PVC	41	450	100%	0
47	0074-0020	96A AV			Sherridon								CI	0	150		
48	0081-0120	99 AV	94 ST	95 ST	Sherridon	276.0	10.5	ART		9	6.8						
49	0018-0010	109A ST	101 AV	102 AV	Old Fort	140.0	7.9	LOC		6	6.0	1953	CI	5	100	40%	4
50	0010-0060	103 ST	101 AV	104 ST	Old Fort	119.0	11	LOC		43	4.6	1951	CI	3	150	90%	1
51	0014-0030	107 ST	101 AV	102 AV	Old Fort	141.0	9.9	LOC		26	3.5	1951	CI	3	150	100%	0
52	0078-0120	98 AV	101 ST	98 AV 1	Downtown	49.0	11.8	COL		18	5.7	2001	PVC	53	300	100%	0
53	0064-0190	94 AV	98 ST	SHERRIDON DR	Sherridon	100.0	10.7	LOC		31	4.9	1959	CI	11	150	100%	0
54	0068-0010	95 ST 1	94 AV	96 AV	Sherridon	272.0	9.4	LOC		33	4.8	1963	AC	15	150	60%	3
55	0010-0040	103 ST	100 AV	101 AV	Downtown	153.0	14.1	LOC		16	5.9	1951	CI	3	150	80%	2
56	0074-0030	96A AV	100 ST	101 ST	Sherridon	219.0	10.3	LOC		19	3.2	1951	AC	3	150	100%	0
57	0001-0170	100 AV	106 ST	107 ST	Old Fort	87.0	13.7	ART		33	5.3	1951	CI	3	150	100%	0
58	0013-0030	106 ST	101 AV	102 AV	Old Fort	127.0	10.9	LOC		29	4.7	1951	CI	3	100	80%	2
59	0061-0070	93 AV	West End	96 ST		118.0	11	LOC			6.7	1968	AC	20	300	100%	0
60	0015-0010	108 ST	98 AV / LOWE AV	99 AV	Downtown	175.0	12	COL		6	4.0	2004	PVC	56	300	100%	0
61	0066-0090	95 AV	SHERRIDON DR	99 ST	Sherridon	99.0	8.6	LOC		28	5.6						
62	0017-0060	109 ST	102 AV	103 AV	Old Fort	245.0	10.7	LOC		15	2.9	1953	CI	5	150	40%	4
63	0068-0020	95 ST 1	96 AV	99 AV 1	Sherridon	122.0	8.6	LOC		11	4.7	1963	AC	15	200	100%	0
64	0005-0070	101 ST	96 AV	96A AV		100.0	11.8	ART				1951	CI	3	200	100%	0
65	0010-0050	103 ST			Old Fort								CI	0	150		
66	0002-0030	100 ST	96A AV	97 AV	Sherridon	99.0	8.7	LOC		26	6.7	1980	AC	32	200	100%	0
67	0072-0090	96 AV			Sherridon												
68	0001-0190	100 AV	108 ST	109 ST	Old Fort	102.0	13.6	ART		15	5.2	1951	CI	3	150	100%	0
69	0013-0010	106 ST	99 AV 3	100 AV	Old Fort	196.0	9	LOC		5	2.9	1951	CI	3	100	100%	0
70	0005-0110	101 ST	98 AV	99 AV	Downtown	179.0	11.9	ART		18	4.7	1951	CI	3	200	100%	0
71	0147-0110	LOWE AV	BROOMFIELD DR	108 ST / 98 AV	Downtown	169.0	10.1	LOC		9	3.8	1970	AC	22	200	100%	0
72	0074-0010	96A AV	SHERRIDON DR	100 ST	Sherridon	219.0	10.6	LOC		5	5.3	1951	AC	3	150	100%	0
73	0082-0030	99 AV 1	100 ST	99 AV	Sherridon	273.0	8.1	LOC		8	3.8	1960	CI	12	200	100%	0
74	0012-0010	105 ST	100 AV	101 AV	Downtown	154.0	11.8	LOC		16	4.6	1952	CI	4	150	100%	0
75	0081-0150	99 AV	100 ST	99 AV 1	Sherridon	173.0	9.8	ART		10	5.8	1989	PVC	41	450	100%	0
76	0005-0090	101 ST	97 AV	98 AV		210.0	12.6	ART		0	7.4	1951	CI	3	200	100%	0
77	0081-0170	99 AV	101 ST	102 ST	Downtown	106.0	7.7	ART		1	3.9	1989	PVC	41	450	100%	0
78	0081-0160	99 AV	99 AV 1	101 ST	Sherridon	117.0	9.5	ART		0	6.0	1989	PVC	41	450	100%	0
79	0082-0010	99 AV 1	95 ST 1	SHERRIDON DR	Sherridon	196.0	8.7	LOC		1	4.6	1963	AC	15	200	100%	0
80	0072-0080	96 AV	95 ST	96 ST	Sherridon	113.0	9.8	LOC			7.3	1965	AC	17	150	100%	0
81	0064-0150	94 AV	Northwest End	95 ST	Sherridon	225.0	10.4	LOC		8	7.0	1967	AC	19	150	60%	3
82	0005-0150	101 ST	101 AV	RIVER RD	Old Fort	214.0	9.7	LOC		1	3.7	2020	PVC	72	150	60%	3
83	0081-0200	99 AV	104 ST	108 ST	Downtown	374.0	7.7	ART			8.5	1989	PVC	41	450	100%	0
84	0083-0030	99 AV 2	102 ST	101 ST	Downtown	105.0	4.2	LOC		2	5.2	1951	CI	3	150	100%	0
85	0147-0090	LOWE AV	ELIZABETH DR	BROOMFIELD DR	Ross Creek Park	263.0	10.4	LOC		12	4.1	1970	AC	22	200	100%	0
86	0007-0060	102 AV	109A ST	109 ST	Old Fort	50.0	9.9	LOC			7.3	1953	CI	5	150	80%	2
87	0014-0020	107 ST	100 AV	101 AV	Old Fort	154.0	8.8	LOC		15	3.2	1951	CI	3	150	100%	0

	SANITARY							STORM							CONDITION RELATED INFRASTRUCTURE ISSUES/COMPLAINTS			NON-CONDITION RELATED INFRASTRUCTURE IMPROVEMENTS			Utility Score				Overall Utility Score	Overall Project Score
	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	NASSCO PACP Structural Weighting	Pipe Size (mm)	Flow Capacity	Flow Capacity Rating	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	NASSCO PACP Structural Weighting	Pipe Size (mm)	Flow Capacity	Flow Capacity Rating	Description	Severity Rating	Score	Description	Importance Rating	Score	Road	Water	Sanitary	Storm		
Points Assigned	0	0	20	40	30	0	10	0	0	20	45	35	0	0												
Project Priority																										
1								1967	Unknown	19		600									0	100	0	93	97	97
2								1967	Unknown	19		600									0	100	0	93	97	97
3								1967	Unknown	19		600									0	100	0	93	97	97
4								1972	Concrete	24		750									70	0	0	91	92	92
5								1972	Concrete	24		825									70	0	0	91	92	92
6																					68	0	0	0	90	90
7																					68	0	0	0	90	90
8																					66	0	0	0	88	88
9																					0	88	0	0	88	88
10								1967	Concrete	19		675									57	0	0	93	85	85
11	1953	Unknown	5	2.7	250			1972	Concrete	24		900									70	0	67	91	83	83
12								1972	Concrete	24		525									75	0	0	70	83	83
13	1965	Concrete	17		375																68	67	93	0	83	83
14																					66	75	0	0	80	80
15																					60	0	0	0	80	80
16		Unknown	0	3	200			1976	Unknown	28		1050									0	88	60	90	79	79
17																					59	0	0	0	79	79
18																					59	0	0	0	79	79
19																					59	0	0	0	79	79
20				0																	59	0	0	0	79	79
21																					60	78	0	0	79	79
22								1967	Concrete	19		600									63	60	0	93	78	78
23								1967	Concrete	19		600									63	59	0	93	78	78
24	1953	VCT	5	5	200																59	75	77	0	77	77
25								1968	Concrete	20		750									57	60	0	93	76	76
26								1967	Concrete	19		600									57	59	0	93	76	76
27	1953	Unknown	5	2.3	200			1970	Concrete	22		1050									63	0	53	92	76	76
28																					63	68	0	0	75	75
29								1968	Concrete	20		750									54	60	0	93	75	75
30	1953	Unknown	5	2	200			1985	Concrete	37		1050									68	0	50	87	74	74
31	1953	Unknown	5	2.8	250			1972	Concrete	24		1050									63	54	68	91	74	74
32	1951	Unknown	3		250																0	69	79	0	74	74
33	1977	Concrete	29		250			1972	Concrete	24		1050									57	59	68	91	73	73
34	1963	VCT	15	2.3	300			1968	Concrete	20		900									61	60	62	93	73	73
35								1985	Concrete	37		1050									68	47	0	87	73	73
36																					60	68	0	0	73	73
37	1951	Unknown	3	2.4	200																73	74	54	0	73	73
38		Unknown	0	3	200			1965	Unknown	17		900									25	88	60	94	71	71
39	1963	VCT	15		200			1965	Concrete	17		900									66	52	54	94	71	71
40	1963	VCT	15	3	250																63	63	68	0	70	70
41	1952	Unknown	4	1.8	200			1968	Concrete	20		600									63	59	48	93	70	70
42	1975	Concrete	27		675																24	79	89	0	70	70
43	1953	Unknown	5	2.1	200			1976	Concrete	28		1050									63	58	51	90	70	70
44	1952	Unknown	4	2	200																66	73	50	0	69	69
45	2001	PVC	53		200			1972	Concrete	24		675									73	54	39	91	68	68
46								1968	Concrete	20		450									57	60	0	72	68	68
47		Unknown	0	3.1	200																0	75	61	0	68	68
48				0				1965	Concrete	17		900									24	0	0	94	67	67
49	1953	Unknown	5	2	200																57	78	50	0	67	67
50	1951	VCT	3		200																62	64	59	0	67	67
51	1951	Unknown	3	3	200																66	59	59	0	67	67
52								1972	Concrete	24		525									59	54	0	70	66	66
53																					62	55	0	0	66	66
54	1963	VCT	15	1.3	300																62	68	53	0	66	66
55	1951	Unknown	3	2.4	200																59	69	54	0	66	66
56	1963	Unknown	15	3	200																66	59	57	0	66	66
57	1967	Unknown	19	2.2	250																62	59	60	0	65	65
58	1951	Unknown	3	2.2	200																59	69	52	0	65	65
59	1968	VCT	20	3	200			1968	Concrete	20		750									25	70	56	93	65	65
60	1953	Unknown	5	3.4	200																63	52	62	0	65	65
61	1963	VCT	15		200																59	0	54	0	65	65
62	1953	Unknown	5	2.2	200			1970	Concrete	22		200									63	78	52	50	65	65
63	2013	VCT	65	3	250																57	63	57	0	64	64
64	1951	Unknown	3		200																0	69	59	0	64	64
65		Unknown	0	2.1	200																0	75	52	0	64	64
66								1967	Concrete	19		675									27	54	0	93	63	63
67	2000	Unknown	52	1.4	200			1970	Unknown	22		900									0	0	34	92	63	63
68	1967	Unknown	19	2.3	200			1967	Concrete	19		450									57	59	50	72	63	63
69	1951	Unknown	3	2.1	200																63	59	51	0	63	63
70	1951	VCT	3	0	250																59	69	44	0	62	62
71	1977	Unknown	29	1	250																63	59	47	0	62	62
72	1963	Unknown	15		200																57	59	54	0	61	61
73	1963	VCT	15	0	250																63	64	41	0	61	61
74	1952	Unknown	4	2	200																59	58	50	0	61	61
75	1963	VCT	15	2	250			1968	Concrete	20		375									57	60	59	50	60	60
76	1951	Unknown	3		250																17	69	79	0	60	60
77	1955	Unknown	7	1	200																63	60	41	0	59	59
78	1963	VCT	15	2	250			1968	Concrete	20		375									54	60	59	50	59	59
79	1963	VCT	15	0	250																57	63	41	0	58	58
80	1965	VCT	17		200			1970	Concrete	22		900									20	52	53	92	58	58
81	1967	VCT	19	3	200			1967	Concrete	19		450									23	66	56	72	58	58
82	2020	PVC	72	0	450			2020	PVC	72		900									63	39	40	74	57	57
83	1953	Unknown	5		200			1985	Concrete	37		1050									11	60	58	87	57	57
84								1990	PVC	42		300									57	59	0	42	57	57
85	2022	PVC	74	0	200			2022	PVC	74		600									63	59	17	73	57	57
86	1953	Unknown	5	2.1	200			1967	Concrete	19		450									21	68	51	72	56	56
87	1951	Unknown	3	0	200																63	59	33	0	56	56

										Asset	ROAD		WATER								SANITARY							STORM							CONDITION RELATED INFRASTRUCTURE ISSUES/COMPLAINTS			NON-CONDITION RELATED INFRASTRUCTURE IMPROVEMENTS			Utility Score				Overall Utility Score	Overall Project Score
										Criterion	Sidewalk Condition (Score per 100 m)	PQI	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	Pipe Size (mm)	Fire Flow Availability	Fire Flow Availability Rating	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	NASSCO PACP Structural Weighting	Pipe Size (mm)	Flow Capacity	Flow Capacity Rating	Pipe Year Installed	Pipe Material	Expected Remaining Service Life (Years)	NASSCO PACP Structural Weighting	Pipe Size (mm)	Flow Capacity	Flow Capacity Rating	Description	Severity Rating	Score	Description	Importance Rating	Score	Road	Water	Sanitary	Storm		
										Points Assigned	7.5	67.5	0	0	10	30	0	20	0	0	20	40	30	0	10	0	0	20	45	35	0	0														
Project Priority	Element ID	Road	From	To	Neighbourhood	Length (m)	Width (m)	Class																																				
88	0010-0030	103 ST	99 AV	100 AV	Downtown	222.0	15.5	LOC		1	5.7	1994	PVC	46	300	100%	0	1994	PVC	46	2	200																57	57	41	0	56	56
89	0080-0010	98 ST	94 AV	97 AV	Sherridon	321.0	11.3	LOC		26	5.2	1963	AC	15	150	100%	0	1963	VCT	15	1.4	200																59	53	42	0	56	56
90	0181-0130	99 AV	95 ST	SHERRIDON DR	Sherridon	261.0	10.7	ART		0	6.7	1989	PVC	41	450	100%	0										1968	Concrete	20		450							23	60	0	72	56	56
91	0004-0050	101 AV	105 ST	106 ST	Old Fort	91.0	11.9	LOC		28	8.9	1951	CI	3	100	80%	2	1951	Unknown	3	2.6	200					1967	Concrete	19		525							12	69	56	72	56	56
92	0002-0050	100 ST	99 AV	100 AV	Downtown	223.0	9.1	LOC		10	3.9	1992	PVC	44	300	100%	0	1992	PVC	44	0	200					1992	Concrete	44		450							63	58	24	63	55	55
93	0076-0040	97 ST	94 AV	97 AV	Sherridon	262.1	11	LOC		24	5.1	1965	AC	17	150	100%	0	1963	VCT	15	1.3	200																59	52	42	0	55	55
94	0007-0050	102 AV	108 ST	109A ST	Old Fort	51.0	10.1	LOC		9	7.0	1953	CI	5	150	100%	0										1967	Concrete	19		450							23	58	0	72	55	55
95	0075-0120	97 AV	Southwest End	100 ST	Sherridon	29.0	8.8	LOC			5.8	1980	AC	12	200	100%	0										2012	PVC	64		375							60	54	0	34	54	54
96	0005-0060	101 ST	93 AV	96 AV		367.0	13.5	ART				2010	PVC	62	300	100%	0	1951	Unknown	3		200																0	49	59	0	54	54
97	0147-0070	LOWE AV	JUBILEE DR	ELIZABETH DR	Ross Creek Park	87.0	10.2	LOC		11	2.9	2022	PVC	74	250	100%	0	2022	PVC	74	4	200					2022	Unknown	74		525							63	33	52	52	53	53
98	0008-0010	102 ST	98 AV	99 AV	Downtown	180.0	13.4	LOC		38	3.3	2023	PVC	75	250	100%	0	2023	PVC	75	3.3	200																68	33	46	0	53	53
99	0007-0040	102 AV	107 ST	108 ST	Old Fort	103.0	10.5	LOC		22	7.0	1952	CI	4	150	100%	0	1952	Unknown	4	3.5	200					1967	Concrete	19		375							25	58	64	51	53	53
100	0001-0180	100 AV	107 ST	108 ST	Old Fort	102.0	13.8	ART		32	7.1	1951	CI	3	150	100%	0	1967	Unknown	19	2.1	250					1967	Concrete	19		375							27	59	59	51	52	52
101	0004-0060	101 AV	106 ST	107 ST	Old Fort	86.0	12	LOC		15	8.9	1951	CI	3	100	100%	0	1951	Unknown	3	2.4	200					1967	Concrete	19		450							10	59	54	72	52	52
102	0073-0020	96 ST	93 AV	94 AV	Sherridon	100.0	9.7	LOC		18	7.1	1968	AC	20	200	100%	0	1963	VCT	15	3	200																25	60	57	0	51	51
103	0181-0010	SHERRIDON DR	93 AV	94 AV	Sherridon	98.0	11.8	COL		20	8.8	1961	AC	13	300	100%	0	1963	Unknown	15		200																13	74	54	0	51	51
104	0001-0130	100 AV	102 ST	103 ST	Downtown	89.0	13.2	ART		3	7.8	2010	PVC	62	300	100%	0	2010	PVC	62	0	250					1967	Concrete	19		675							17	49	31	93	51	51
105	0176-0030	ROCQUE DR			Downtown					0								2014	Unknown	66	0						1976	Concrete	28		900							0	0	11	90	51	51
106	0001-0140	100 AV	103 ST	104 ST	Downtown	86.0	13.5	ART			8.1	2011	PVC	63	300	100%	0	2011	PVC	63	0	250					1967	Concrete	19		600							14	49	30	93	50	50
107	0007-0010	102 AV	103 ST	105 ST	Old Fort	183.0	10.8	LOC		4	7.5	1951	CI	3	150	100%	0	1951	Unknown	3	2.9	200																20	59	58	0	50	50
108	0008-0030	102 ST	99 AV	100 AV	Downtown	223.0	13.7	LOC		1	5.8	1995	PVC	47	300	100%	0	1995	PVC	47	0	200																57	57	23	0	49	49
109	0005-0120	100 AV	101 ST	102 ST	Downtown	105.0	13.6	ART		1	8.6	2010	PVC	62	300	100%	0	2010	PVC	62	0	250					1967	Concrete	19		750							12	49	31	93	49	49
110	0007-0020	102 AV	105 ST	106 ST	Old Fort	94.0	9.8	LOC		13	6.5	1951	CI	3	150	100%	0	1951	Unknown	3	2	200																26	59	50	0	49	49
111	0072-0120	96 AV	101 ST	LOWE AV		72.0	10.1	LOC		9	4.8	2023	PVC	75	250	100%	0	2023	PVC	75	3	200																57	33	43	0	48	48
112	0147-0050	LOWE AV	LANGLEY DR	JUBILEE DR	Ross Creek Park	93.0	10.4	LOC		6	5.2	2023	PVC	75	250	100%	0	2023	PVC	75	2.6	200					2023	PVC	75		525							57	33	40	52	48	48
113	0073-0030	96 ST	94 AV	96 AV	Sherridon	266.0	10.2	LOC		33	8.2	1963	AC	15	150	100%	0	1963	VCT	15	3	200																20	53	57	0	47	47
114	0004-0030	101 AV	103 ST	104 ST	Old Fort	86.0	12.1	LOC		11	8.4	1951	CI	3	100	80%	2	1967	Unknown	19	2	200																14	69	47	0	47	47
115	0081-0190	99 AV	103 ST	104 ST	Downtown	86.0	7.5	ART		4	7.2	1989	PVC	41	450	100%	0																					21	60	0	0	46	46
116	0001-0150	100 AV	104 ST	105 ST	Downtown	94.0	13.9	ART		1	7.1	2012	PVC	64	300	100%	0	2012	PVC	64	0	250					1967	Concrete	19		450							22	48	30	72	46	46
117	0176-0020	ROCQUE DR			Ross Creek Park					0		2014	PVC	66	200			2014	Unknown	66	3	200																0	46	45	0	46	46
118	0079-0010	98 AV 1	98 AV	ROCQUE DR	Downtown	95.0	7.5	LOC		13	9.1	2001	PVC	53	300	100%	0	2001	PVC	53	2	200					1972	Concrete	24		525							9	54	39	70	46	46
119	0147-0010	LOWE AV	96 AV	OBRIEN DR	Ross Creek Park	82.0	11.1	LOC		4	3.9	2023	PVC	75	250	100%	0	2023	PVC	75	1.5	200																63	33	30	0	46	46
120	0005-0130	101 ST	99 AV	100 AV	Downtown	224.0	12.3	ART		11	4.9	2020	PVC	72	300	100%	0	2020	PVC	72	0	375					2020	PVC	72		375							57	44	40	31	46	46
121	0147-0030	LOWE AV	OBRIEN DR	LANGLEY DR	Ross Creek Park	92.0	10.3	LOC		4	3.9	2023	PVC	75	250	100%	0	2023	PVC	75	3	200					2023	PVC	75		375							63	33	43	30	45	45
122	0005-0140	101 ST	100 AV	101 AV	Downtown	154.0	11	ART		5	8.7	2020	PVC	72	300	100%	0	2020	PVC	72	0	450					2020	PVC	72		900							11	44	40	74	45	45
123	0147-0040	LOWE AV	LANGLEY DR	LANGLEY DR	Ross Creek Park	92.0	10.3	LOC		10	5.0	2023	PVC	75	250	100%	0	2023	PVC	75	1.2	200					2023	PVC	75		525							57	33	27	52	45	45
124	0078-0150	98 AV			Downtown							2001	PVC	53	150												1976	Unknown	28		375							0	42	0	47	45	45
125	0001-0130	100 AV	100 ST	101 ST	Downtown	317.0	8.2	LOC		9	6.4	1965	CI	17	150	100%	0																					27	52	0	0	45	45
126	0181-0020	SHERRIDON DR	94 AV	95 AV	Sherridon	102.0	11.9	COL		6	8.8	1959	CI	11	150	100%	0	1963	Unknown	15	3	200																11	55	57	0	44	44
127	0005-0120	101 ST			Downtown							2020	PVC	72	300				Unknown	0	0																	0	55	33	0	44	44
128	0181-0030	SHERRIDON DR	95 AV	SHERRIDON DR 1	Sherridon	136.0	13.1	COL		20	8.8								Unknown	0	3.5	200																13	0	64	0	44	44
129	0147-0080	LOWE AV	ELIZABETH DR	ELIZABETH DR	Ross Creek Park	87.0	10.4	LOC		13	4.1	2022	PVC	74	250	100%	0	2022	PVC	74	0	200					2022	PVC	74		525							63	33	17	52	44	44
130	0007-0030	102 AV	106 ST	107 ST	Old Fort	87.0	11	LOC		61	6.7	1951	CI	3	150	100%	0	1951	Unknown	3	0	200																30	59	33	0	44	44
131	0011-0010	104 ST	98 AV	99 AV	Downtown	180.0	10.8	LOC		31	3.8	2023	PVC	75	100			2023	Unknown	75	2.3	200					2023	Unknown	75		375							68	28	37	30	44	44
132	0017-0040	109 ST	99 AV 3	100 AV	Old Fort	197.0	9.3	LOC		14	8.6	1953	CI	5	150	100%	0	1953	Unknown	5	2	200																12	58	50	0	43	43
133	0004-0040	101 AV	104 ST	105 ST	Old Fort	94.0	11.8	LOC		30	8.9	1951	CI	3	100	80%	2	1967	Unknown	19	0	200					1967	Concrete	19		375							12	69	29	51	43	43
134	0004-0010	101 AV	101 ST	102 ST	Downtown	105.0	12.9	LOC		36	8.4	1975	CI	27	150	80%	2																					18	57	0	0	43	43
135	0181-0040	SHERRIDON DR	SHERRIDON DR 1	99 AV	Sherridon	392.0	12.7	COL		25	8.8	1963	AC	15	200	100%	0	1963	VCT	15	0	250																13	63	41	0	42	42
136	0072-0110	96 AV	100 ST	101 ST	Sherridon	211.0	10.9	LOC		10	9.1	2000	PVC	52	200	100%	0	2000	PVC	52	3.3	250																9	44	62	0	42	42
137	0147-0020	LOWE AV	OBRIEN DR	OBRIEN DR	Ross Creek Park	110.0	10.2	LOC		16	5.1	2023	PVC	75	250	100%	0	2023	PVC	75	2	200					2023	PVC	75		300							59	33	34	30	42	42
138	0014-0010	107 ST	99 AV 3	100 AV	Old Fort	195.0	9.9	LOC		17	7.3	1951	CI	3	150	100%	0	1951	Unknown	3	0	200																23	59	33	0	42	42
139	0101-0010	BROOMFIELD DR	98 AV / LOWE AV	LOWE AV	Ross Creek Park	208.0	8.9	LOC			6.7	2016	PVC	68	200	100%	0	2016	PVC	68		250																25	36	53	0	41	41
140	0177-0020	ROSS DR	98 AV 1	98 AV	Downtown	291.0	9.2	LOC			9.1	2018	PVC	70	200	100%	0	2018	PVC	70		200					2018	PVC	70		600							7	35	32	75	40	40
141	0015-0060	108 ST	102 AV	Northwest End	Old Fort	156.0	10.4	LOC		15	8.3	2022	PVC	74	200	40%	4	2022	PVC	74	2.8	200																14	53	42	0	39	39
142	0011-0030	104 ST	99 AV	100 AV	Downtown	223.0	13.4	LOC		8	4.9	2022	PVC	74	300	100%	0	2022	PVC	74	0	200					2022	PVC	74		375							57	43	17	31	39	39
143	0001-0160	100 AV	105 ST	106 ST	Downtown	91.0	13.7	ART		0	7.5	2011	PVC	63	300	100%	0	2011	PVC	63	0	250					1967	Concrete	19		375							17	49	30	51	39	39
144	0005-0100	101 ST										2017	CI	69	200				Unknown	0	0	200																0	44	33	0	39	39
145	0079-0030	98 AV 1	ROCQUE DR	ROSS DR	Downtown	93.0	7.5	LOC		18	9.1	2001	PVC	53	300	100%	0	2001	PVC	53	2	200																11	54	39	0	38	38
146	0147-0100	LOWE AV			Ross Creek Park					13		2023	AC	75	200																							25	41	0	0	38	38
147	0146-0010	LANGLEY DR	LOWE AV	LOWE AV	Ross Creek Park	311.0	9.2	LOC		6	6.7	2006	PVC	58	200	100%	0	2006	PVC	58		200					2006	PVC	58		300							25	41	37	36	37	37
148	0145-0010	JUBILEE DR	LOWE AV	LOWE AV	Ross Creek Park	296.0	9.5	LOC		0	5.2	2018	PVC	70	200	100%	0	2018	PVC	70	0	200					2018	PVC	70		375							54	35	18	32	37	37
149	0015-0030	108 ST	99 AV	100 AV	Old Fort	226.0	11.4	COL		10	6.5	2011	PVC	63	200	100%	0	2011	PVC	63	2	200																26	39	37	0	37	37
150	0086-0020	99 ST	95 AV	96 AV	Sherridon	121.0	10.4	LOC		13	8.1	1963	CI	15	150	100%	0	1963	Unknown	15	0	200																15	53	30	0	36	36
151	0079-0020	98 AV 1	ROCQUE DR	ROCQUE DR	Downtown	264.0	7.5	LOC		3	9.1	2001	PVC	53	300	100%	0																					9	54	0	0	35	35
152	0176-0010	ROCQUE DR	98 AV	98 AV	Downtown	487.0	9.3	LOC			9.1	2014	PVC	66	200	100%	0	2014	PVC	66		200					2014	PVC	66		450							7	37	34	55	35	35
153	0072-0100	96 AV	99 ST	100 ST	Sherridon	136.0	11.1	LOC		36	8.3	2000	PVC	52	200	100%	0	2000	PVC	52	0	250																19	44	33	0	35	35
154	0147-0060	LOWE AV	JUBILEE DR	JUBILEE DR	Ross Creek Park	97.0	10.4	LOC			7.8	2023	PVC	75	250	100%	0	2023	PVC	75		200					2023	PVC	75		525							16	33	30	52	35	35
155	0120-0010	ELIZABETH DR	LOWE AV	LOWE AV	Ross Creek Park	261.0	9	LOC		0	6.8	2016	PVC	68	200	100%	0	2016	PVC	68	0	200					2016	PVC	68		450							22	36	18	54	35	35
156	0079-0040	98 AV 1	ROSS DR	ROSS DR	Downtown	96.0	7.3	LOC		0	9.1	2001	PVC	53	300	100%	0																					6	54	0	0	34	34
157	0010-0010	103 ST	98 AV	99 AV	Downtown	181.0	13.8	LOC		16	8.4	2022	PVC	74	250	100%	0	2022	PVC	74	3	200					2013	PVC	65		375							16	33	44	34	34	34
158	0075-0150	97 AV	101 ST	Northeast End	Ross Creek Park	77.0	6.5	LOC		38	7.4																											25	0	0	0	34	34
159	0150-0010	OBRIEN DR	LOWE AV	LOWE AV	Ross Creek Park	273.0	9	LOC			7.8	1998	PVC	50	150	100%	0	1998	PVC	50		200																17	35	40	0	33	33
160	0177-0010	ROSS DR			Ross Creek Park							2018	Unknown	70				2018	Unknown	70																		0	30	30	0	30	30
161	0015-0040	108 ST	102 AV	101 AV	Old Fort	154.0	10.1	LOC		4	6.5	2015	PVC	67	200	100%	0	2015	PVC	67	0	200																26	37	18	0	30	30
162	0004-0090	101 AV	109A ST	109 ST	Old Fort	50.0	11.9	LOC		12	7.5																											19	0	0	0	26	26
163	0015-0050	108 ST	101 AV	102 AV	Old Fort	141.0	10.6	LOC		11	8.3	2021	PVC	73	200	100%	0	2021	PVC	73	0	200					2020	PVC	72		300							14	34	17	31	26	26
164	0075-0130	97 AV	100 ST	101 ST	Sherridon	220.0	9	COL		3	8.5	2012	PVC	64	200	100%	0	2012	PVC	64	0	200																13	38	19	0	25	25
165	0004-0020	101 AV	102 ST	103 ST	Downtown	89.0	13.1	LOC		62	8.3																											19	0	0	0	25	25
166	0081-0230	99 AV	108 ST	108A ST / 112 ST	Downtown	52.0	7.1	ART		5	7.8																											17	0	0	0	23	23
167	0008-0040	102 ST		101 AV	Downtown	50.0	9.8	ART		8	8.4	2011	PVC	63	150	100%	0	2011	PVC	63	0	200																13	29	19	0	22	22
168	0004-0080	101 AV	108 ST	109A ST	Old Fort	51.0	11.8	LOC		5	8.1																											15	0	0	0	21	21
169	0004-0070	101 AV	107 ST	108 ST	Old Fort	103.0	11.9	LOC			8.9																											8	0	0	0	11	11
170	0075-0140	97 AV			Ross Creek Park																																	0	0	0	0	0	0
171	0078-0230	98 AV			Downtown																																	0	0	0	0	0	0
172	0163-0021	RIVER RD																																			0	0	0	0	0	0
173	0181-0060	SHERRIDON DR			Sherridon																																	0	0	0	0	0	0

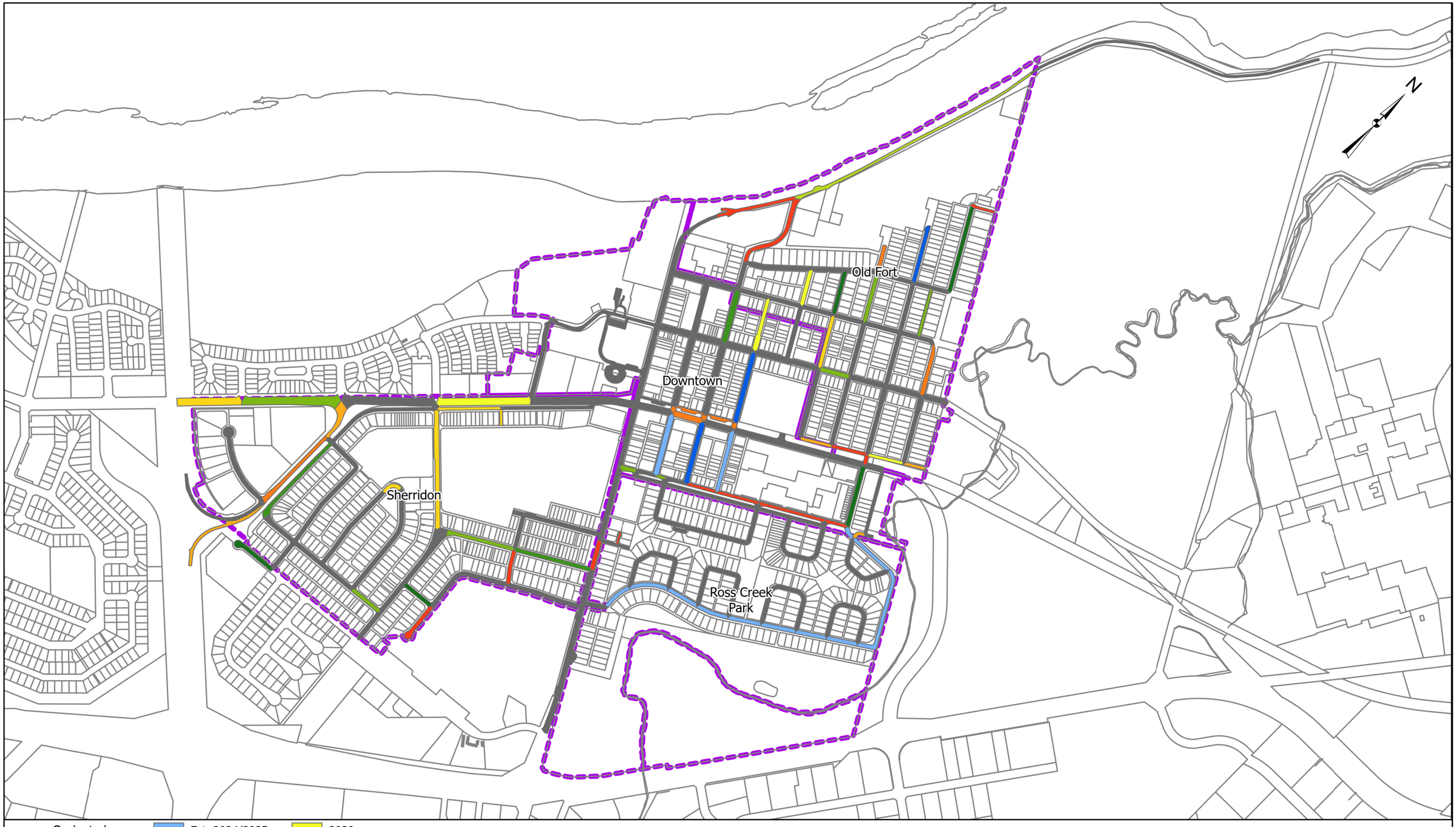
APPENDIX B

10-Year Capital Plan

a division of Englobe

Estimated Rehab Year	Element ID	Road	From	To	Road						Sidewalk		Water			Sanitary			Storm			Total Estimated Cost
					Reconstruct	FDR	Trench Reconstruction	Mill & Overlay (50mm)	Mill & Overlay (75mm)	Microsurfacing	Reconstruct	Spot Repair	Remove & Replace (Open Cut)	Trenchless	Re-Lining	Remove & Replace (Open Cut)	Re-Lining	Spot Repair	Remove & Replace (Open Cut)	Re-Lining	Spot Repair	
					$236.00	$179.00	$265.00	$51.00	$63.00	$16.00	$352.00	$405.00	$3,080.00	$1,720.00	$1,310.00	$3,230.00	$970.00	$3,250.00	$3,110.00	$970.00	$3,180.00	
					m^2	m^2	m^2	m^2	m^2	m^2	m	m	m	m	m	m	m	m	m	m	m	
2024	0078-0160	98 AV	103 ST	104 ST				684				13										$40,000.00
2024	0078-0170	98 AV	104 ST	ROCQUE DR				974														$50,000.00
2024	0002-0020	100 ST	96 AV	96A AV			396	658											99			$446,000.00
2024	0078-0180	98 AV	ROCQUE DR	ROSS DR				1595														$81,000.00
2024	0163-0010	RIVER RD	101 ST	104 ST	2210								213			384			155			$2,898,000.00
2024	0011-0050	104 ST	103 ST	RIVER RD			423	2020				34	106									$555,000.00
2024	0006-0020	101A ST	97 AV	Northwest End			147	66					48									$190,000.00
2024	0015-0020	108 ST			306								10			34						$213,000.00
2024	0086-0010	99 ST	South End	95 AV			536	845				24	146									$644,000.00
2024	0009-0010	103 AV	109 ST	Northeast End			0	527					0									$27,000.00
2024	0084-0020	99 AV 3	107 ST	108 ST			411	483								103						$465,000.00
2024	0078-0190	98 AV	ROSS DR	108 ST / LOWE AV				529														$27,000.00
2024	0005-0080	101 ST	96A AV	97 AV				1060														$54,000.00
2024	0010-0060	103 ST	101 AV	104 ST			154				51		143									$499,000.00
2025	0008-0020	102 ST			219								7						58			$253,000.00
2025	0010-0020	103 ST											7						26			$101,000.00
2025	0011-0020	104 ST			229								6						113			$424,000.00
2025	0081-0180	99 AV	102 ST	103 ST			358	943					89									$418,000.00
2025	0083-0020	99 AV 2	103 ST	102 ST	611							15	89						33			$529,000.00
2025	0017-0050	109 ST	100 AV	101 AV	1624							26	299			256						$2,142,000.00
2025	0067-0010	95 ST	94 AV	96 AV	2509								137						109			$1,351,000.00
2025	0083-0010	99 AV 2	104 ST	103 ST			348	271					87									$374,000.00
2025	0014-0040	107 ST	102 AV	Northwest End			375	440					127									$512,000.00
2026	0140-0010	HWY 15 NB to 95 ST NB ramp	HWY 15 NB	94 AV	2330								427						207			$2,509,000.00
2026	0084-0010	99 AV 3	106 ST	107 ST			346	442			63					87						$419,000.00
2026	0078-0200	98 AV	LOWE AV	Northeast End			158	174					83									$307,000.00
2026	0067-0020	95 ST	96 AV	99 AV	1697								317			110			211			$2,389,000.00
2026	0084-0040	99 AV 3	109 ST	Northeast End	512								62						84			$575,000.00
2027	0002-0040	100 ST											46									$141,000.00
2027	0081-0110	99 AV	CENTRE OF HWY 15 O/P	94 ST	3836								141						0			$1,339,000.00
2027	0013-0020	106 ST	100 AV	101 AV	1638						256		154			156						$1,455,000.00
2027	0181-0050	SHERRIDON DR			4356								164			97			206			$2,488,000.00
2027	0075-0110	97 AV	97 ST	98 ST				631				24										$42,000.00
2027	0082-0020	99 AV 1	SHERRIDON DR	100 ST	1491								167			146						$1,339,000.00
2028	0012-0020	105 ST	101 AV	102 AV	1257								106			106			108			$1,301,000.00
2028	0084-0030	99 AV 3	108 ST	109 ST	882							17	288			100						$1,426,000.00
2028	0011-0040	104 ST	100 AV	101 AV	1823							50	154			154						$1,421,000.00
2028	0081-0140	99 AV	SHERRIDON DR	100 ST	5569								265						196			$2,738,000.00
2031	0078-0140	98 AV	102 ST	103 ST				228				3										$13,000.00
2031	0074-0020	96A AV			2062								277			200						$1,985,000.00
2031	0081-0120	99 AV	94 ST	95 ST			936	5393											234			$1,251,000.00
2031	0018-0010	109A ST	101 AV	102 AV	1116								281			143						$1,592,000.00
2031	0014-0030	107 ST	101 AV	102 AV	1537							51	140			147						$1,292,000.00
2031	0078-0120	98 AV	101 ST	98 AV 1				604				13										$36,000.00
2031	0064-0190	94 AV	98 ST	SHERRIDON DR	1113						172											$323,000.00
2031	0001-0170	100 AV	106 ST	107 ST	1070						148		87			86						$850,000.00
2032	0068-0010	95 ST 1	94 AV	96 AV	2784						255		188			358						$2,481,000.00
2032	0010-0040	103 ST	100 AV	101 AV	2303							77	153			155			173			$2,083,000.00
2032	0074-0030	96A AV	100 ST	101 ST	2399							81	218			222						$1,985,000.00
2033	0013-0030	106 ST	101 AV	102 AV	1326							45	128			123						$1,122,000.00
2033	0061-0070	93 AV	West End	96 ST	1597								164			143			48			$1,491,000.00
2033	0015-0010	108 ST	98 AV / LOWE AV	99 AV			697	1393								182						$843,000.00
2033	0066-0090	95 AV	SHERRIDON DR	99 ST				1030				29										$64,000.00
2033	0017-0060	109 ST	102 AV	103 AV	2671							49	248			246						$2,208,000.00
2029 & 2030	0163-0020	RIVER RD	104 ST	PCH	5466								1602			2276			0			$13,574,000.00
2034+	0068-0020	95 ST 1	96 AV	99 AV 1			432	622				23				108						$504,000.00
2034+	0005-0070	101 ST	96 AV	96A AV				1219														$62,000.00
2034+	0010-0050	103 ST			858								94			78						$742,000.00
2034+	0002-0030	100 ST	96A AV	97 AV	1018							32	100						214			$1,228,000.00
2034+	0072-0090	96 AV						1056														$54,000.00
2034+	0001-0190	100 AV	108 ST	109 ST	1283							48	181			161			146			$1,856,000.00
2034+	0013-0010	106 ST	99 AV 3	100 AV	2128								215			191						$1,780,000.00
2034+	0005-0110	101 ST	98 AV	99 AV				2137				63										$135,000.00
2034+	0074-0010	96A AV	SHERRIDON DR	100 ST				340														$17,000.00
2034+	0082-0030	99 AV 1	100 ST	99 AV			755	1514					189									$859,000.00
2034+	0012-0010	105 ST	100 AV	101 AV	1651							51	154			156						$1,386,000.00
2034+	0081-0150	99 AV	100 ST	99 AV 1	3699								112			108			250			$2,342,000.00
2034+	0005-0090	101 ST	97 AV	98 AV				2635														$134,000.00
2034+	0081-0170	99 AV	101 ST	102 ST	1593								100			41						$817,000.00
2034+	0081-0160	99 AV	99 AV 1	101 ST	2320								379			134			45			$2,288,000.00
2034+	0082-0010	99 AV 1	95 ST 1	SHERRIDON DR			771	906					273									$1,092,000.00
2034+	0072-0080	96 AV	95 ST	96 ST				192														$10,000.00
2034+	0064-0150	94 AV	Northwest End	95 ST	3090								277			248			203			$3,014,000.00
2034+	0005-0150	101 ST	101 AV	RIVER RD			804	1437											201			$912,000.00
2034+	0081-0200	99 AV	104 ST	108 ST	6191								374			246			249			$4,183,000.00

Estimated Rehab Year	Element ID	Road	From	To	Road						Sidewalk		Water			Sanitary			Storm			Total Estimated Cost
					Reconstruct	FDR	Trench Reconstruction	Mill & Overlay (50mm)	Mill & Overlay (75mm)	Microsurfacing	Reconstruct	Spot Repair	Remove & Replace (Open Cut)	Trenchless	Re-Lining	Remove & Replace (Open Cut)	Re-Lining	Spot Repair	Remove & Replace (Open Cut)	Re-Lining	Spot Repair	
					$236.00	$179.00	$265.00	$51.00	$63.00	$16.00	$352.00	$405.00	$3,080.00	$1,720.00	$1,310.00	$3,230.00	$970.00	$3,250.00	$3,110.00	$970.00	$3,180.00	
					m^2	m^2	m^2	m^2	m^2	m^2	m	m	m	m	m	m	m	m	m	m	m	
2034+	0083-0030	99 AV 2	102 ST	101 ST			400	253					100									$427,000.00
2034+	0007-0060	102 AV	109A ST	109 ST	512								51			50			70			$659,000.00
2034+	0014-0020	107 ST	100 AV	101 AV			611	1016				52	153									$705,000.00
2034+	0010-0030	103 ST	99 AV	100 AV	3052								208			200						$2,008,000.00
2034+	0080-0010	98 ST	94 AV	97 AV	3642							124	364						77			$2,271,000.00
2034+	0081-0130	99 AV	95 ST	SHERRIDON DR	5773								120						197			$2,347,000.00
2034+	0004-0050	101 AV	105 ST	106 ST	981							31	92			93			46			$971,000.00
2034+	0002-0050	100 ST	99 AV	100 AV	2456								145						90			$1,307,000.00
2034+	0076-0040	97 ST	94 AV	97 AV	2858							101	429			377			46			$3,396,000.00
2034+	0007-0050	102 AV	108 ST	109A ST	516								53						128			$683,000.00
2034+	0075-0120	97 AV	Southwest End	100 ST	336								334						27			$1,193,000.00
2034+	0005-0060	101 ST	93 AV	96 AV				5458														$278,000.00
2034+	0007-0040	102 AV	107 ST	108 ST	1036							33	101			49						$727,000.00
2034+	0001-0180	100 AV	107 ST	108 ST	1292						177		102			103						$1,014,000.00
2034+	0004-0060	101 AV	106 ST	107 ST	934							29	88			41			87			$905,000.00
2034+	0073-0020	96 ST	93 AV	94 AV	1052							31	102			48						$731,000.00
2034+	0181-0010	SHERRIDON DR	93 AV	94 AV			215	946				34	54									$284,000.00
2034+	0001-0130	100 AV	102 ST	103 ST				1182														$60,000.00
2034+	0176-0030	ROCQUE DR						172														$9,000.00
2034+	0001-0140	100 AV	103 ST	104 ST				1172														$60,000.00
2034+	0007-0010	102 AV	103 ST	105 ST	1972								165			184						$1,569,000.00
2034+	0008-0030	102 ST	99 AV	100 AV			835	2071					209									$970,000.00
2034+	0001-0120	100 AV	101 ST	102 ST						1453												$23,000.00
2034+	0007-0020	102 AV	105 ST	106 ST	1009							15	220			92			13			$1,259,000.00
2034+	0072-0120	96 AV	101 ST	LOWE AV			159									40						$171,000.00
2034+	0073-0030	96 ST	94 AV	96 AV	2891						509		338			334			54			$3,152,000.00
2034+	0004-0030	101 AV	103 ST	104 ST	956							30	86			86			97			$1,084,000.00
2034+	0081-0190	99 AV	103 ST	104 ST			348	931					87									$408,000.00
2034+	0001-0150	100 AV	104 ST	105 ST			375	927											96			$444,000.00
2034+	0176-0020	ROCQUE DR															20					$19,000.00
2034+	0079-0010	98 AV 1	98 AV	ROCQUE DR				689				17										$42,000.00
2034+	0005-0130	101 ST	99 AV	100 AV				2544				76										$160,000.00
2034+	0005-0140	101 ST	100 AV	101 AV			620	1234											155			$709,000.00
2034+	0078-0150	98 AV						482														$25,000.00
2034+	0001-0110	100 AV	100 ST	101 ST			1230	2517					308									$1,402,000.00
2034+	0181-0020	SHERRIDON DR	94 AV	95 AV	1232								157			93						$1,077,000.00
2034+	0005-0120	101 ST																				$0.00
2034+	0181-0030	SHERRIDON DR	95 AV	SHERRIDON DR 1			546	1242				52				295						$1,182,000.00
2034+	0007-0030	102 AV	106 ST	107 ST			353	617			71		92									$435,000.00
2034+	0017-0040	109 ST	99 AV 3	100 AV	2178							69	189			190			66			$1,942,000.00
2034+	0004-0040	101 AV	104 ST	105 ST			340	663			160		93									$467,000.00
2034+	0004-0010	101 AV	101 ST	102 ST			410	930			185		102									$537,000.00
2034+	0181-0040	SHERRIDON DR	SHERRIDON DR 1	99 AV				599				9										$34,000.00
2034+	0072-0110	96 AV	100 ST	101 ST			836	1442								268						$1,161,000.00
2034+	0014-0010	107 ST	99 AV 3	100 AV			843					70	215									$912,000.00
2034+	0101-0010	BROOMFIELD DR	98 AV / LOWE AV	LOWE AV				1951														$100,000.00
2034+	0177-0020	ROSS DR	98 AV 1	98 AV				171														$9,000.00
2034+	0001-0160	100 AV	105 ST	106 ST			338	819											90			$412,000.00
2034+	0005-0100	101 ST																				$0.00
2034+	0079-0030	98 AV 1	ROCQUE DR	ROSS DR				679				17										$41,000.00
2034+	0146-0010	LANGLEY DR	LOWE AV	LOWE AV				2999														$153,000.00
2034+	0145-0010	JUBILEE DR	LOWE AV	LOWE AV				2845														$145,000.00
2034+	0015-0030	108 ST	99 AV	100 AV			411	1776											103			$519,000.00
2034+	0086-0020	99 ST	95 AV	96 AV			522					22	182									$709,000.00
2034+	0079-0020	98 AV 1	ROCQUE DR	ROCQUE DR				2002														$102,000.00
2034+	0176-0010	ROCQUE DR	98 AV	98 AV			71	95											92			$311,000.00
2034+	0072-0100	96 AV	99 ST	100 ST				1494			131											$122,000.00
2034+	0120-0010	ELIZABETH DR	LOWE AV	LOWE AV				2490														$127,000.00
2034+	0079-0040	98 AV 1	ROSS DR	ROSS DR				700														$36,000.00
2034+	0150-0010	OBRIEN DR	LOWE AV	LOWE AV				2568														$131,000.00
2034+	0177-0010	ROSS DR																	188			$584,000.00
2034+	0015-0040	108 ST	100 AV	101 AV				1607														$82,000.00
2034+	0015-0050	108 ST	101 AV	102 AV				1452				51										$95,000.00
2034+	0075-0130	97 AV	100 ST	101 ST				2492														$127,000.00
2034+	0008-0040	102 ST		101 AV			378			2172									95			$429,000.00
2034+	0078-0210	98 AV																	108			$335,000.00



Cadastral
Neighbourhoods
Estimated Rehab Year
2035+
Est. 2022
Est. 2024/2025
2026
2027
2028
2029
2030
2031 & 2032
2033
2034
2035

MPE
a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

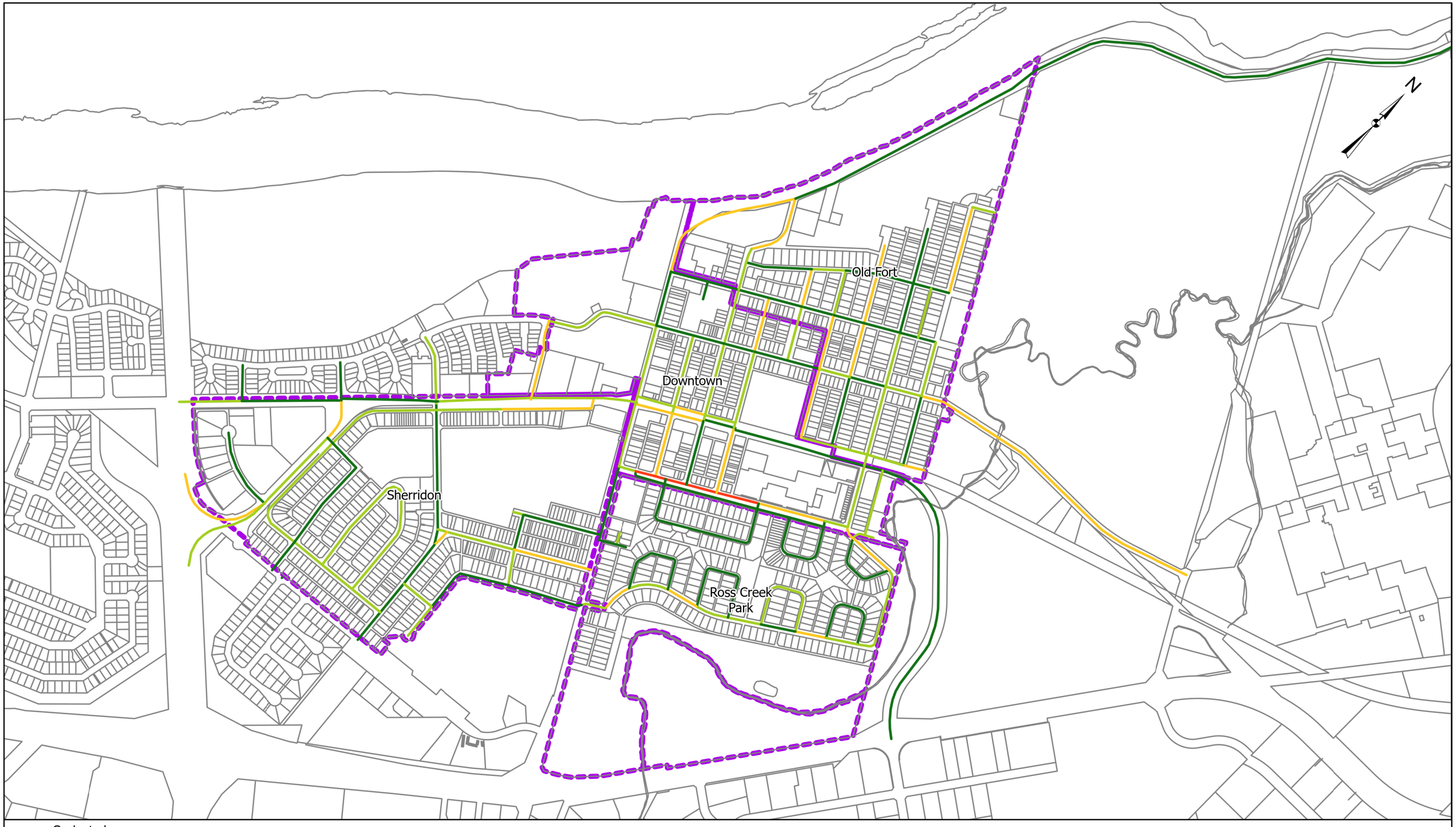
10 YEAR REHABILITATION PLAN

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.1

APPENDIX C

Infrastructure Drawings

a division of Englobe



Cadastral

Neighbourhoods

Road PQI -10YR

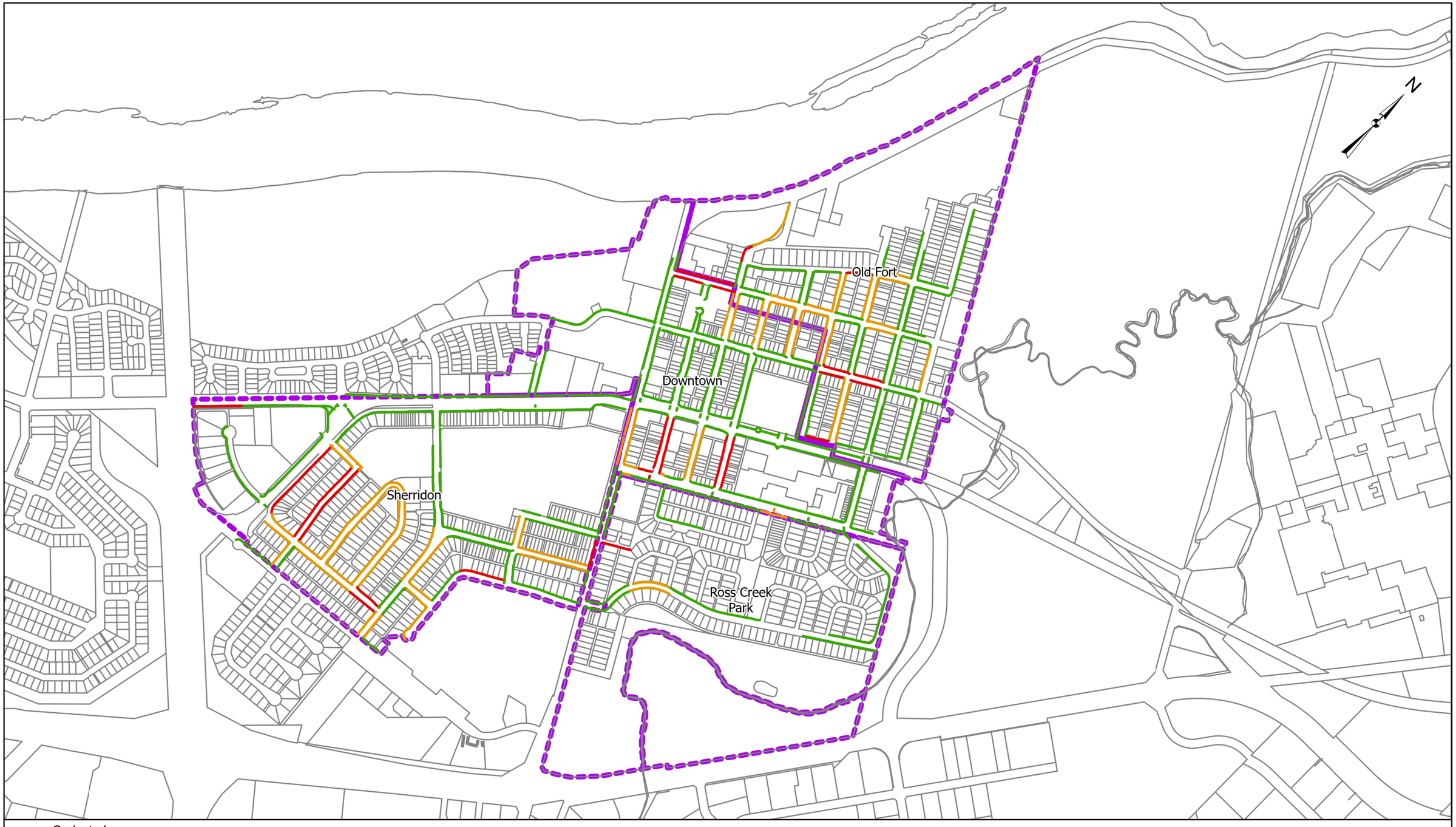
- 0-1.5
- 1.5-4.0
- 4.0-6.5
- 6.5+

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

ROAD PQI

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.2



Cadastral

Neighbourhoods

Sidewalk Condition Score

0-15

16-30

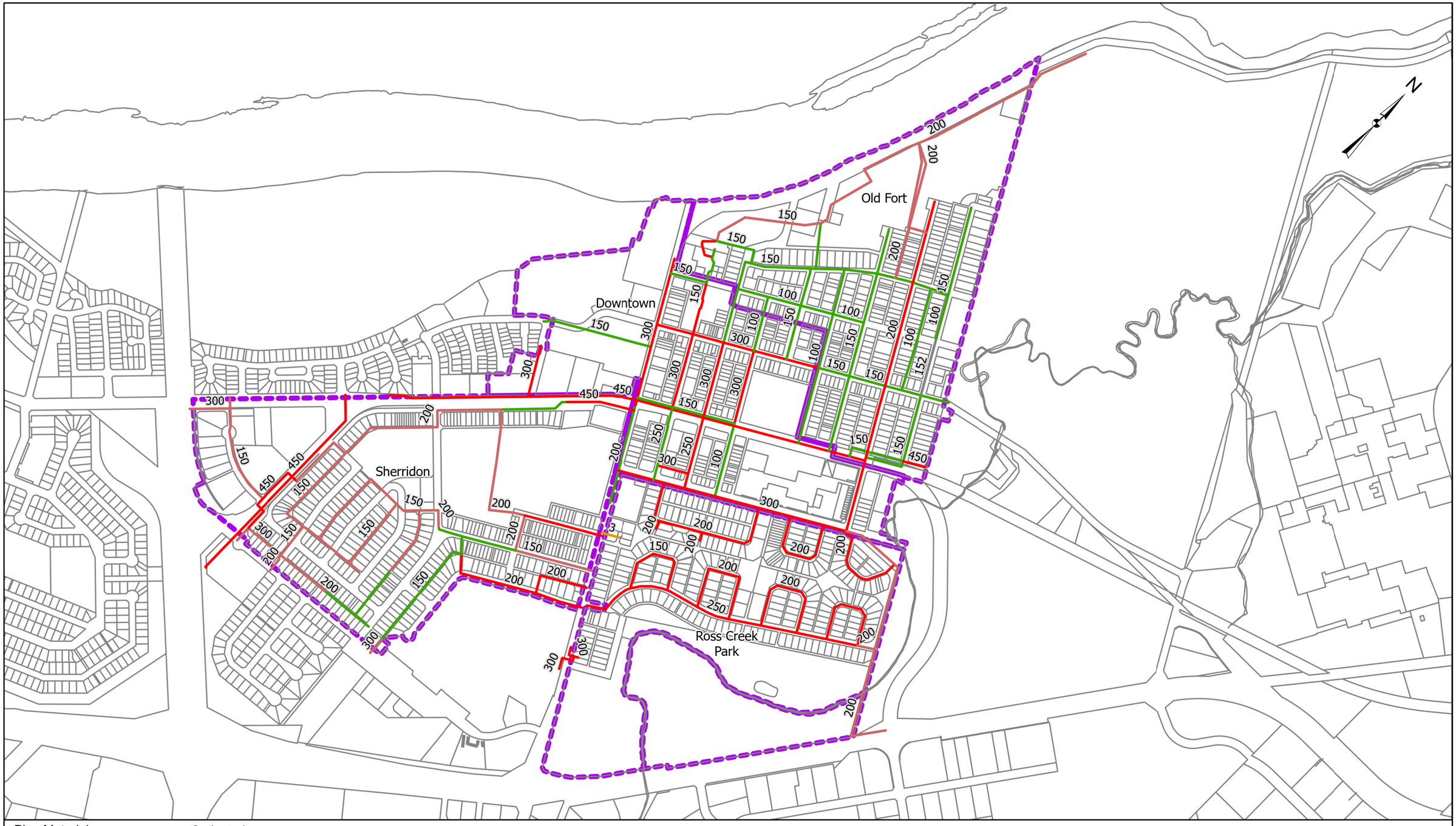
31+

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

Sidewalk Condition

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.3



Pipe Material
- AC
- CI
- Ductile Iron
- Unknown
- PVC

Cadastral

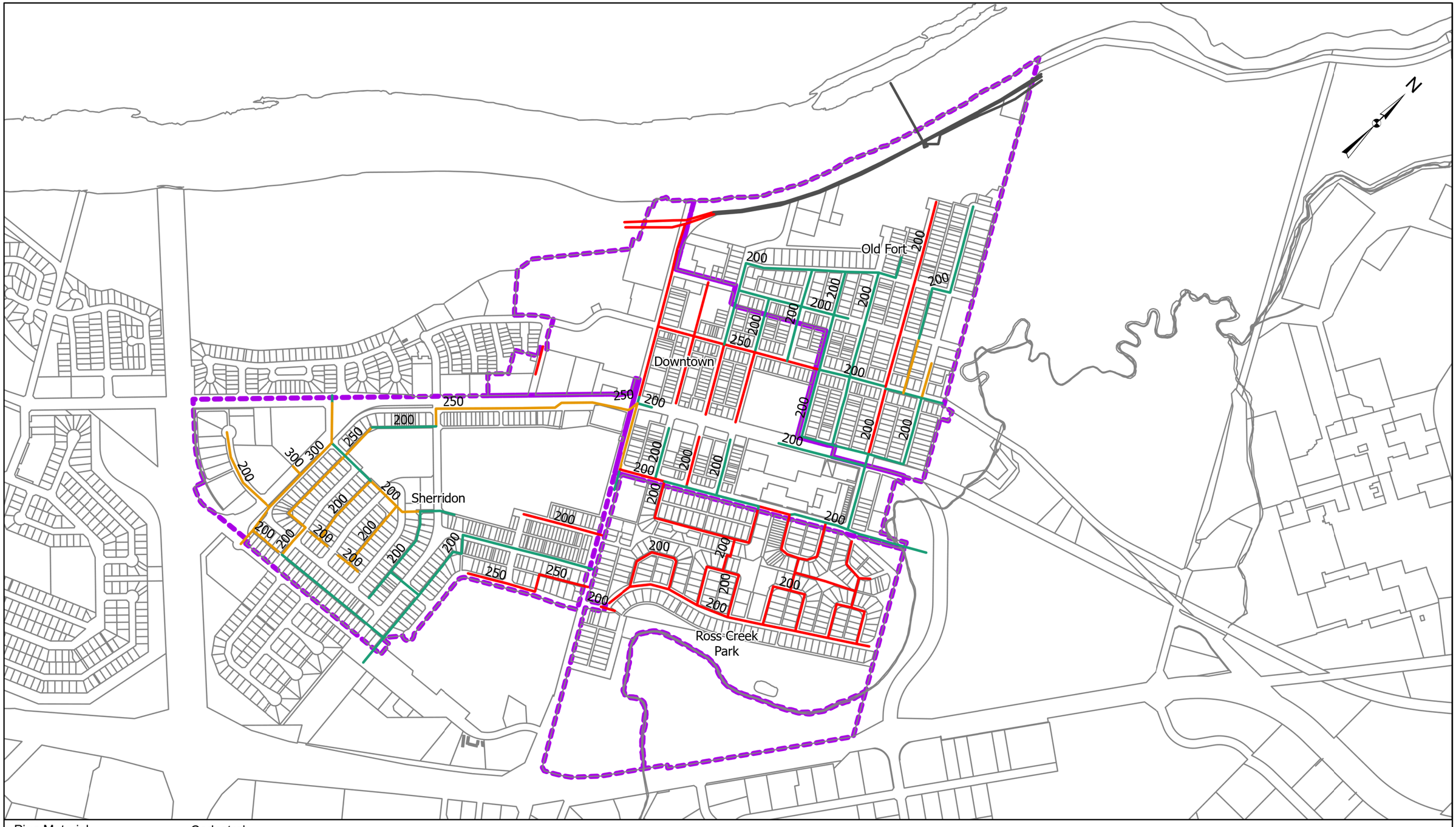
Neighbourhoods

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

WATERMAIN

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.4



Pipe Material
- Concrete
- PVC
- VCT
- Unknown

Cadastral

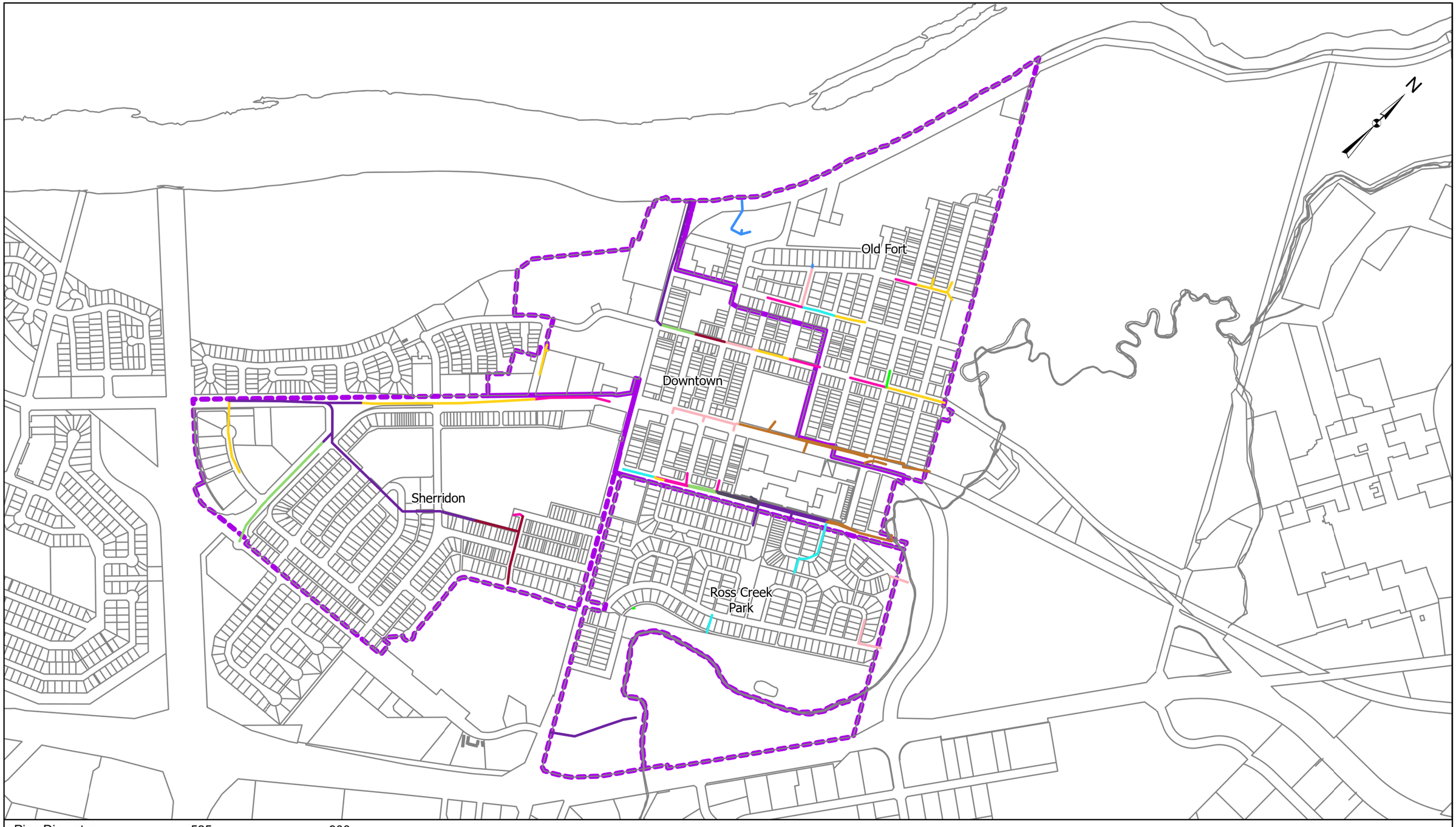
Neighbourhoods

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

SANITARY

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.5



Pipe Diameter

- 0
- 200
- 375
- 450
- 525
- 600
- 675
- 750
- 825
- 900
- 1050
- Cadastral
- Neighbourhoods

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

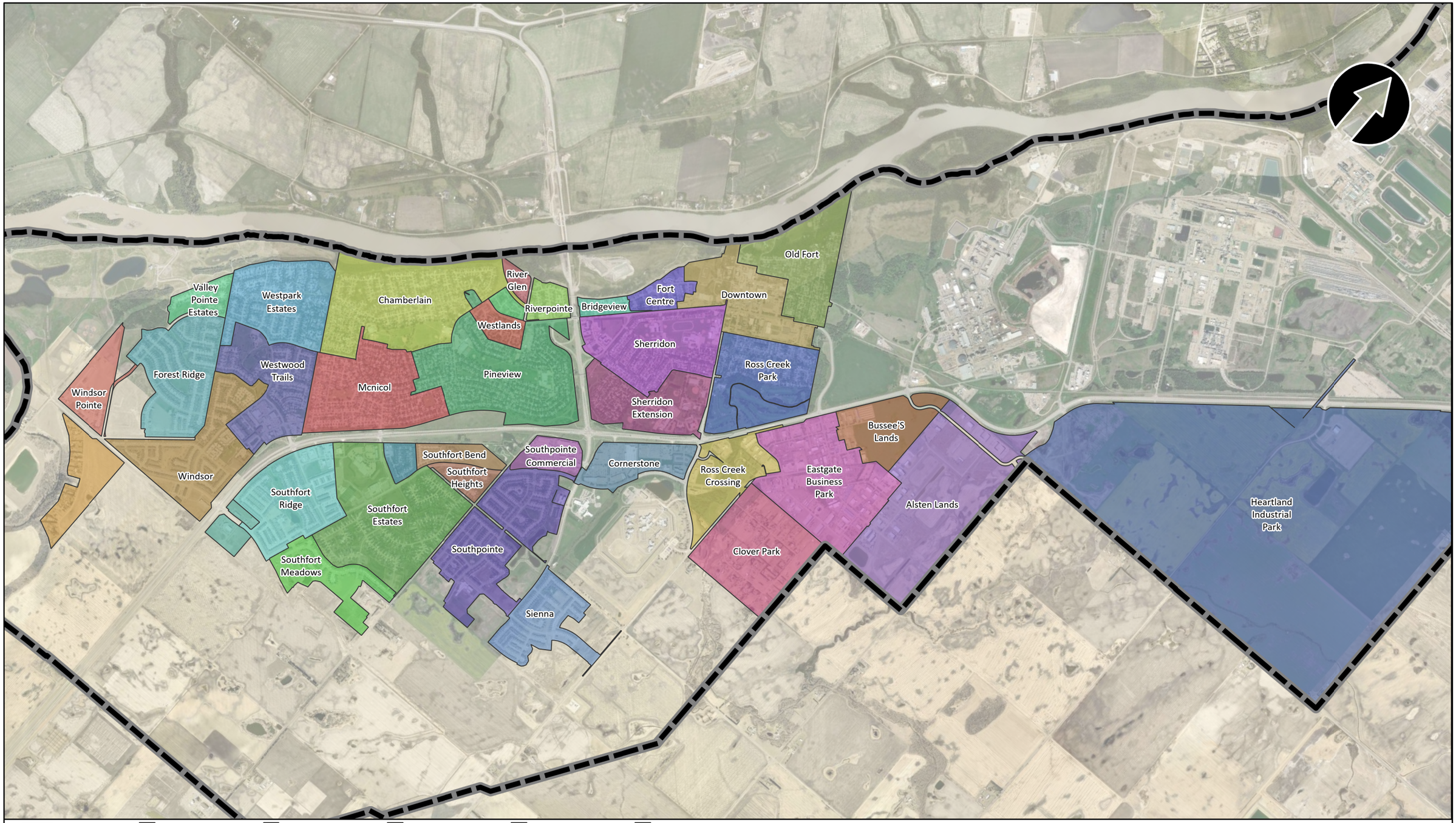
STORM

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.6

APPENDIX D

Citywide Assessment Drawings

a division of Englobe



City Boundary

Neighbourhood

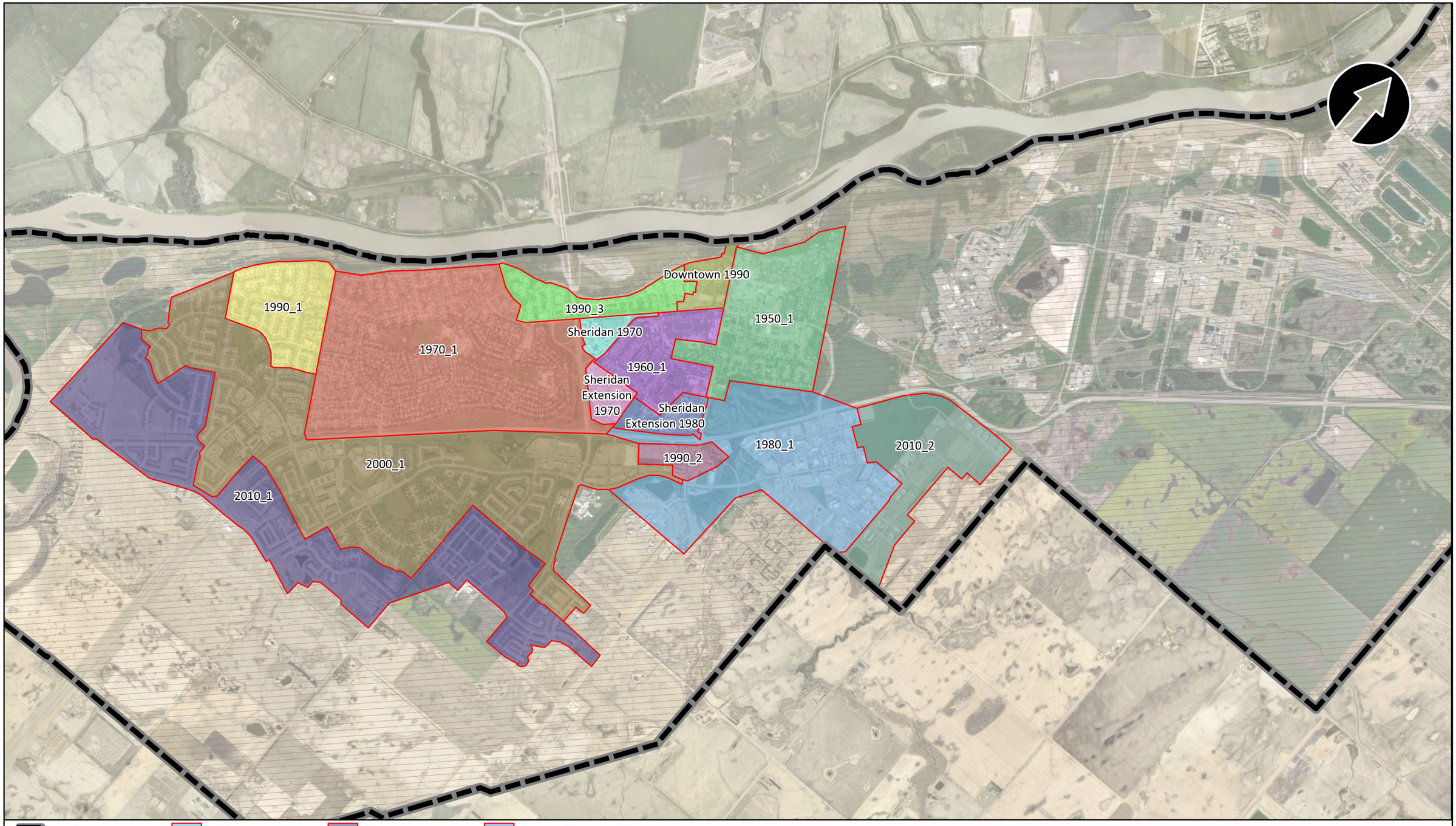
- Alsten Lands
- Bridgeview
- Bussee's Lands
- Chamberlain
- Clover Park
- Cornerstone
- Countryside
- Downtown
- Eastgate Business Park
- Forest Ridge
- Fort Centre
- Heartland Industrial Park
- McNicol
- Old Fort
- Pineview
- Pointe-aux-Pins
- River Glen
- Riverpointe
- Ross Creek Crossing
- Ross Creek Park
- Sherridon
- Sherridon Extension
- Sienna
- Southfort Bend
- Southfort Estates
- Southfort Heights
- Southfort Meadows
- Southfort Ridge
- Southfort Ridge Commercial
- Southfort Village
- Southpointe
- Southpointe Commercial
- Valley Pointe Estates
- Westlands
- Westpark Estates
- Westwood Trails
- Windsor
- Windsor Pointe

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

CITYWIDE ASSESSMENT

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.1



City Boundary

Neighbourhood Decade

- 1950
- 1960
- 1970
- 1980
- 1990_1
- 1990_2
- 1990_3
- 2000
- 2010_1
- 2010_2
- Downtown 1990
- Sheridan 1970
- Sheridan Extension 1970
- Sheridan Extension 1980
- Falls outside boundary

a division of Englobe

NEIGHBOURHOOD REHABILITATION STUDY

CITYWIDE ASSESSMENT

SCALE: 1:10,000	DATE: DECEMBER 2023	JOB: 5381-007-00	FIGURE: 1.2