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REPORT

City of Camrose

Downtown Infrastructure Renewal Plan







February 2024

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EXECUTIVE SUMMARY

The City of Camrose (City) retained Associated Engineering to develop the Downtown Infrastructure Renewal Plan (DIRP) for the Downtown Redevelopment Area (DRA) of Camrose. The objective is to identify infrastructure rehabilitation projects to be included in a conceivable 25-year program. The scope of work included existing roadways, sidewalks, and underground infrastructure (water mains, sanitary sewers, and stormwater sewers).

This report presents the results of the assessment of the **2023-2047 Downtown Infrastructure Renewal Plan**.

The infrastructure candidates presented in this report for rehabilitation were identified using the following criteria:

- Data from the City's GIS records (Underground asset details).
- The City's water main break history over the last 13 years.
- Condition Assessments of Sidewalks based on an Asset Damage Index established in the Concrete Sidewalk Condition Assessment Report, Tetra Tech, 2021.
- Condition Assessments of Roadways based on a Pavement Condition Index established in the Pavement Condition Assessment Report, Tetra Tech, 2019.
- Storm and Sanitary sewers CCTV survey results identified in the Storm and Sanitary CCTV Inspections and Condition Assessments, ISL, 2020.
- CCTV surveys were undertaken in accordance with National Association of Sewer Service Companies' (NASSCO) Pipeline Assessment Certification Program (PACP) Rating System.
- Recommended infrastructure upgrades identified in the various utility master plans.

A numerical based evaluation criteria was developed in consultation with the City to identify and prioritize rehabilitation candidates for inclusion in the DIRP. Following identification, condition assessment, and asset scoring, rehabilitation projects were selected and prioritized based on the score and opinions of probable cost. Meetings were held with the City to verify program development methods, and to further categorize the upgrade priority of infrastructure assets.

The 2022 DIRP covers the area from 48 Avenue to 51 Avenue, between 46 Street and 53 Street, broken out into 68 individual blocks. The proposed program is summarized in the following **Table ES-1**.

Table ES-1 DIRP Project and Cost Summary

Renewal Years	Number of Blocks	Length of Watermain (m)	Length of Sanitary Sewer (m)	Length of Storm Sewer (m)	Low-Cost Scenario	High-Cost Scenario
2023-2025	8	798	791	612	$3,322,000	$4,496,000
2026-2028	9	613	1147	370	$2,547,000	$3,669,000
2029-2031	7	909	655	435	$3,897,000	$4,186,000
2032-2034	6	842	617	348	$3,561,000	$3,742,000
2035-2037	9	807	1087	520	$1,697,000	$2,994,000
2038-2040	6	768	973	639	$110,000	$3,912,000
2041-2043	9	1158	860	492	$586,000	$3,604,000
2044-2047	14	1321	1135	758	$56,000	$4,622,000
Total[1]	**68**	**7216**	**7265**	**4174**	**$15,776,000**	**$31,225,000**

[1] Costs include a 12% Engineering Fee, 5% Emerging Issues Fund, and 20% Contingency Fund.

The following recommendations are made based on the analysis that was undertaken. The recommendations provide some direction for the City to further develop the 25-Year Program:

1. Implementation of the proposed 2023-2025 DIRP at a **budget of $3.3 M to $4.5 M** over three years.
2. Allocation of a portion of the annual budget for engineering fees for the preparation of the **design and tender packages** for the subsequent year's projects. These costs should cover any additional data collection, pre-design, and detailed design required for a rehabilitation project. An allowance equivalent to 12% of the anticipated construction costs is recommended.
3. Allocation of a portion of the annual budget to addressing emerging issues. This will cover potential scope creep that typically arises during implementation of a renewal program. An allowance equivalent to 5% of the anticipated construction costs is recommended.
4. The City should retain a portion of each year's uncommitted budget for a contingency fund to cover fluctuation in the construction market, and potential costs unforeseen during pre-design stages. A sum equal to 20% of the anticipated construction costs should be considered.
5. The City should implement a CCTV Inspection Program to verify the condition of underground assets at a total cost of **$414,000**. This program can be implemented on a 10-year timeline.
6. The City should review the 25-year DIRP on 3-year cycles, based on condition assessment data, and re-prioritizing infrastructure needs.
7. The City should consider additional identification labels for their GIS system to group underground assets by geographic location and roadway. Presently, there is no intuitive way of connecting underground assets with their location aside from visually in GIS maps. This could provide an improved means of tracking surface and underground project overlaps.

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1 INTRODUCTION

In 2019, the City of Camrose developed the Downtown Area Redevelopment Plan (DARP) to provide a unified vision and implementation strategy for the continued development and redevelopment of the downtown area for the next 25 years. As a part of the DARP Study, the City performed a preliminary review of the surface and underground infrastructure within the public rights-of-way. The City also completed relevant condition assessments for roadways, sidewalks, and storm water, and sanitary sewers.

The City retained Associated Engineering to develop a 25-year Downtown Infrastructure Renewal Plan (DIRP) to commence the implementation of the DARP. The objective of the project was to provide a plan for the replacement and renewal of infrastructure, based on the following:

- Existing condition.
- Capacity to meet future demands of land use.
- Suitability for low impact rehabilitation.
- Condition of overall facilities sharing the same right-of-way.

1.1 Initial Studies

The DIRP evaluated the surface and underground infrastructure separately. The surface component included a review of existing surface infrastructure and the development of a model that meets requirements outlined in the DARP. The underground component of the Renewal Plan included a review of the various master planning documents and the development of an underground infrastructure model.

1.1.1 Surface Model Active Corridor Cross Sections - Draft (July 2020)

Associated Engineering prepared this technical memorandum to summarize the review and assessment of the cross sections developed in the DARP. The technical memorandum also provided recommendations for modifications to the sections prior to adopting them and developing the surface model for the DIRP.

Associated Engineering reviewed the cross sections outlined in the DARP, in consideration of the various master planning documents. The cross sections outlined in the DARP did not assign widths and Associated Engineering had to update them to include standard dimensions. The updates revealed that the established widths of the road rights-of-way were insufficient to accommodate the proposed cross sections. The following revisions were recommended to the cross sections:

- Option LSR/C-1 and NC-1 be adopted for Local Street Residential/Collector and Neighbourhood Collectors that are not along the active transportation corridor.
- Option LSR/C-3 and NC-3 be adopted for Local Street Residential/Collector and Neighbourhood Collectors that are along the active transportation corridor. LSR/C-3 and NC-3 allow parallel parking to be maintained on one side of the roadway and is consistent with a two-direction bike lane on one side recommended for the Urban Boulevards A and B.
- Option UB (A)-1 be adopted along 50 Street that is not within the active transportation corridor.
- Option UB (A)-2 be adopted along 50 Street that is within the active transportation corridor.
- Option UB (B)-1 be adopted along 50 Avenue that is not within the active transportation corridor.
- Option UB (B)-2 be adopted along 50 Avenue that is within the active transportation corridor.

Further modifications to the cross section will be required during preliminary and detailed design phases in consideration of existing landscaping, franchise utilities, and municipal infrastructure. See **Appendix A** for a copy of the "Surface Model Active Corridor Cross Sections, 2020" technical memorandum.

1.1.2 Underground Model Background Data Review - Draft (February 2021)

The objective of this technical memorandum was to identify information gaps and summarize our review and technical assessment of the utility master plans. This included recommendations made for underground infrastructure upgrades relevant to the utility model for the DIRP.

A summary of the existing utilities and proposed upgrades within the DRA was prepared following review of the master plans, the utility and roadway condition assessment reports, and feedback from the franchise utilities. These proposed utility upgrades were to be incorporated into the DARP's four rehabilitation phases.

1.1.2.1 Franchise Utilities

The franchise utilities present in the DRA include ATCO Gas, Telus, Fortis Alberta, and Eastlink. These were contacted to present the project and to understand their respective opinions and requirements. Based on these discussions it was determined that there were no planned franchise utility upgrades that would impact the DIRP. Advance notice of construction disturbances in the utility rights-of-way will be provided to the franchise utility companies to allow for the coordination of any facility upgrades or relocations that may result from the disturbance.

ATCO

ATCO Gas confirmed that there were no planned upgrades within the DRA. However, it was noted that the aging ATCO facilities within the area would likely require upgrades if disturbances were to occur within their right-of-way. ATCO advised that the current franchise agreement with the City stated that as long as sufficient construction notice was provided to them, they would relocate or upgrade infrastructure at no cost to the City.

Telus

Telus confirmed that there were no planned upgrades within the DRA. As redevelopment of the downtown occurs, relocations of Telus utility infrastructure may be required if surface work conflicts are identified. Above ground infrastructure may need to be replaced with buried infrastructure. Upgrades will be dictated by the details of the overall downtown redevelopment and will need to be determined in coordination with Telus.

Fortis Alberta (Fortis)

Fortis confirmed that there were no planned upgrades within the DRA. However, Fortis advised that their planning was based on 5-year cycles. It was agreed that Fortis would contact the City, should they plan any large-scale upgrades for the 5-10-year timeframe. As redevelopment of the downtown occurs, relocations of infrastructure may be required if surface work conflicts are identified. Above ground infrastructure may need to be moved below grade. Upgrades will be dictated by the details of the overall downtown redevelopment and will need to be determined in coordination with Fortis.

Eastlink

Fortis confirmed that there are no planned upgrades within the DRA. As redevelopment of the downtown occurs, relocations of infrastructure may be required due to utility of surface works conflicts. Above ground infrastructure may need to be replaced with buried infrastructure. Upgrades will be dictated by the details of the overall downtown redevelopment and will need to be determined in coordination with Eastlink.

1.1.2.2 Water

The 2006 Water Distribution System Master Plan Update (Associated Engineering) identified a number of recommended upgrades within the downtown core. These upgrades included new installations, pipe upsizing, and cast-iron (CI) pipe replacements, as summarized below:

- All watermain upgrades within the DRA were to be a minimum of 300 mm PVC, as per the City's Minimum Design Standards for Development.
- Where possible, watermain upgrades were to be completed concurrently with road resurfacing work based on the 2019 Pavement Condition Assessment Report.
- Where recommended upgrades did not align with road resurfacing works, further consideration for upgrade phasing was recommended.

1.1.2.3 Sanitary

The 2007 Sanitary Master Plan (Associated Engineering) modelled the trunk sewers within the DRA and did not identify any required upgrades with respect to capacity increase.

The 2020 ISL Engineering condition assessment report identified various locations within the DRA where repairs or rehabilitation was needed. Most of the deficient areas could be addressed by the recommended Cured-in-Place Pipe (CIPP) rehabilitation method. These upgrades are not anticipated to impact the road surface and could be completed in the order that the severity of the deficiency dictates. Consideration for upgrade phasing is required in the few areas where excavation is necessary to conduct the repairs. For example, should a section of roadway require the watermain and storm sewer to be upgraded, consideration should be given to upgrade the sanitary sewer with a replacement rather than lining.

The majority of the collection sewer mains are 200 mm in diameter. Further consideration for upsizing the sanitary sewer mains should be made to align with the future land use and minimum standard. The minimum diameter required for the commercial zoning is 250 mm. Additionally, hydraulic modelling of the collection sewers should be completed to assess the overall network relating to the DRA, particularly if a specific development may adversely affect capacity, i.e., a high water user.

1.1.2.4 Storm

The 2008 Stormwater Master Plan Update (Associated Engineering) recommended a more detailed assessment of the existing system within the DRA. This was required to determine the available options for alleviating flooding risks in trapped low areas during the 1:5-year storm events. This presents the opportunity to consider low impact development features (bio-retention), mass storage and re-use, surface storage, and release through conventional stormwater management facilities. The master plan recommended exploring options for on-lot stormwater management, in roof top, and parking lot areas in any redevelopment in the downtown area. Hydraulic modelling of the storm sewer was recommended to assess the overall network that services the DRA.

Additionally, CCTV condition assessment of the existing stormwater system should be completed to consider CIPP rehabilitation or replacement requirements. See **Appendix B** for a copy of the "Underground Model Background Data Review, 2021" technical memorandum.

2 METHODOLOGY

The DIRP was based on an analytical hierarchy process to evaluate and prioritize infrastructure rehabilitation needs within the DRA. Each of the infrastructure systems was evaluated based on a weighted criteria to determine a final score that was used for prioritization. The criteria and weighting factors are described in more detail in the following sections.

2.1 Roadway Infrastructure

In 2019 the City retained Tetra Tech Inc. to conduct condition assessments of the paved roadways (except paved back alleyways). The results of the assessment were used to determine a score for the surface condition.

2.1.1 Assessment

Tetra Tech performed their inspections using a Pavement Surface Profiler (PSP-7000) vehicle and collected pavement surface distresses, International Roughness Index, and digital image logs. Network level distress data was collected in accordance with American Society for Testing and Materials (ASTM) -D6433 methodology, whereby individual distresses are rated based on severity and extent. The recorded distresses included the following:

- Alligator Cracking
- Transverse Cracking
- Weathering
- Ravelling
- Longitudinal Cracking
- Rutting
- Potholes

Tetra Tech used the Pavement Condition Index (PCI) for their analysis. This is a standard index commonly used in North America, which expresses the condition of the pavement surface as a function of the severity and extent of the visible distresses. PCI is determined using methodology documented in ASTM-D6433-11.

The Tetra Tech report provided a 20-year plan of recommended rehabilitation measures to be taken for each road segment on the basis of a $2 million per year budget allowance. The recommendations were ultimately based on the current degree of deficiency, the extent of rehabilitation work required, the cost of rehabilitation work required, and the user priority of the road segment.

2.1.2 Application of the Roadway Assessment to the DIRP

The roadway infrastructure assessment report identified 22 road segments within the downtown for rehabilitation. **Table 2-1** provides prioritization of the road sections based on the evaluated PCI scores and summarizes the recommend rehabilitation method and cost. Refer to **Figure E-1** in **Appendix E** for a site plan identifying the block numbering.

Table 2-1 2019 Infrastructure Assessment Recommended Roadway Rehabilitation

AE Block-Block Name	AE Block Number	Length (m)	Class	Treatment	Recommended Improvement Year	Priority Level	Treatment Cost[1]
R48Aa51s52s	26	99	Arterial	Mill and Fill (50 mm)	2020	1	$45,017
R48Aa52s52As	25	104	Arterial	Mill and Fill (50 mm)	2020	1	$47,329
R48Aa52As53s	24	40	Arterial	Mill and Fill (50 mm)	2021	1	$21,722
R46s50a51a	65	164	Collector	Overlay (50 mm)	2021	1	$62,647
R46s49a50a	67	66	Collector	Mill and Fill (50 mm)	2022	1	$25,851
R50a49s50s	13	105	Collector	Mill and Fill (50 mm)	2024	2	$58,892
R48Aa50s51s	27	104	Collector	Mill and Fill (50 mm)	2024	2	$50,583
R52As48Aa49a	36	172	Local	Mill and Fill (50 mm)	2025	2	$57,366
R51s48a48Aa	44	139	Arterial	Full Depth Mill	2025	2	$150,120
R51s48Aa49a	43	172	Collector	Mill and Fill (50 mm)	2026	2	$87,494
R51s49a50a	42	173	Collector	Mill and Fill (50 mm)	2026	2	$86,019
R52s48Aa49a	39	172	Local	Reconstruction	2030	3	$118,250
R52As50a51a	34	172	Local	Reconstruction	2030	3	$102,168
R47s48a49a	64	246	Local	Reconstruction	2030	3	$146,124
R53s49a50a	32	172	Arterial	Mill and Fill (50 mm)	2032	3	$94,791
R52s50a51a	37	172	Local	Mill and Fill (50 mm)	2033	4	$85,852
R53s48Aa49a	33	176	Arterial	Mill and Fill (50 mm)	2033	4	$100,142
R53s50a51a	31	173	Arterial	Mill and Fill (50 mm)	2033	4	$89,281
R50a50s51s	12	104	Collector	Full Depth Mill	2037	4	$90,584
R50a48s49s	14	99	Collector	Full Depth Mill	2038	4	$90,090
R51a52s52As	2	100	Collector	Full Depth Mill	2038	4	$96,850
R51s50a51a	41	171	Collector	Full Depth Mill	2038	4	$157,833

[1] Costs are in 2019 dollars.

The recommended improvement year provided in **Table 2-1** spans from 2020 to 2038. **Table 2-2** summarizes the conversion of the recommended improvement year into a standardized priority ranking and scoring system that was used to compare all of the infrastructure assets within the DIRP.

Table 2-2 Roadway Rehabilitation Priority Scoring

Recommended Improvement Year	AE Priority Level	Score Value
2019 – 2022	Priority 1	20
2023 – 2027	Priority 2	10
2028 – 2032	Priority 3	5
2033 - 2038	Priority 4	1

The score values for the roadway rehabilitation priority scoring were established based on discussions with the City in which they identified roadway condition to be of less importance than underground asset condition when assessing the rehabilitation of a block. The scores were adjusted and updated through an iterative review with the City to achieve a scoring distribution that reflected their rehabilitation priorities.

A Priority 1 roadway is assigned a score of 20 which is equal to approximately 50% of the score value of a lower priority pipe (<60 years old, 200-300 mm diameter, PVC). The intention is that a high priority roadway will be weighted higher than minor pipe diameter or age differences, but not as much as any single underground asset on its own. From Priority 1, the scores diminish in value until they only serve as minor means of differentiating blocks when all other asset scores are equivalent.

Since the Tetra Tech report evaluates surface condition independent from the underground utilities, most of the recommended treatments may be superseded based on the implications of required underground rehabilitation. For the purposes of this report, the PCI year and consequent priority score are used in the scoring on a block-by-block basis. The recommended surface treatments from the Tetra Tech report are identified for each block, but the actual treatment approach should be based a more up to date condition assessment at the time of detailed design review, along with considerations of planned underground repairs to minimize future rework.

Refer to the “Pavement Condition Assessment Report – Roadway, Tetra Tech, 2019” attached as **Appendix C** for the full methodology used in the road condition assessment.

2.2 Sidewalk Infrastructure

The City’s 2021 Concrete Sidewalk Condition Assessment Report evaluated sidewalk infrastructure based on Asset Damage Indices (ADI). The sidewalks on each block were given a condition score on a scale of zero to ten, with zero indicating the most critical condition, and ten the least critical. A corresponding recommended treatment for each score range was also identified. **Table 2-3** summarizes the criteria used to convert the prioritization of sidewalk rehabilitation into a standardized priority ranking and scoring system that was used to compare all of the infrastructure assets within the DIRP.

Table 2-3 Sidewalk Rehabilitation Priority Scoring

ADI Score	Recommended Treatment	AE Priority Level	Score Value
0 ≤ ADI < 2	Replace Asset	Priority 1	*10*
2 ≤ ADI < 5	Rehabilitation Program	Priority 2	*5*
5 ≤ ADI < 8	Maintenance Program	Priority 3	*1*
8 ≤ ADI ≤ 10	Do-Nil/Field Inspection	Priority 4	*0*

As with the roadway score values, the score values for the sidewalk rehabilitation scoring were determined through an iterative review with the City to achieve a scoring distribution that reflected their rehabilitation priorities.

A Priority 1 sidewalk is assigned a score of 10 which is equal to approximately 25% of the score value of a lower priority pipe (<60 years old, 200-300 mm diameter, PVC). The intention is that a high priority sidewalk will be weighted higher than very minor pipe diameter or age differences. From Priority 1, the scores diminish in value until they only serve as minor means of differentiating blocks when all other asset scores are equivalent.

2.3 Underground Infrastructure

The City provided GIS data of their underground water, sanitary, and storm infrastructure. The GIS data included age, material, diameter, and break history (for water). Additionally, the City's 2020 Sanitary and Storm CCTV Inspection and Condition Assessment report was provided.

This information was reviewed in conjunction with the latest water, sanitary, and storm master plans and was used to establish a condition scoring matrix and rehabilitation prioritization system.

2.3.1 Water Mains

The City's water distribution network maintenance records included data from the last 13 years. However, it only identified 11 breaks within the DRA. The break history was inadequate to use to justify or prioritize the potential pipe rehabilitation. Therefore, for the majority of the water pipes the asset condition was established based on age, material, and diameter. Additionally, the water master plan was reviewed to identify the recommended upgrades, including network looping and upsizing. As part of the evaluation criteria, the City confirmed that they preferred to prioritize network looping. As such, network looping was weighted higher upsizing in the evaluation criteria.

Break History

The assessment criteria involved assigning a score for break history, material, age, and diameter, as summarized in **Table 2-4** below.

Material

Polyvinyl Chloride (PVC) watermain is taken to be the baseline material based on the current engineering design standards. Non-Polyvinyl Chloride (PVC) watermain materials such as Asbestos Cement (AC) and Cast Iron (CI) no longer meet current engineering standards as acceptable pipe materials and were assigned higher scores to emphasize their need for replacement. In particular, the City has been implementing a replacement program for CI pipe since 1982.

Age

For pipe age, it was assumed that most of the common materials had a similar expected service life of 60 years. Score scores were allocated based on the remaining service life.

Diameter

For pipe diameter, larger pipes service larger catchment areas and have a greater impact when failure occurs. Larger diameter pipes were assigned higher scores.

A master plan recommended looping expansion upgrade was assigned a flat score of 50, as there is no existing infrastructure in the block to assign a score to.

Table 2-4 summarizes the scoring criteria for watermains.

Table 2-4 Watermain Asset Scoring Matrix

Water Main Asset Scoring Matrix								
# of Breaks on Main	0	1	2					
Score Value	***0***	***15***	***30***					
# of Breaks on Services	0	1	2					
Score Value	***0***	***3***	***5***					
Material	PVC	PVC + NON-PVC[1]	NON-PVC					
Score Value	***1***	***10***	***30***					
Age Range (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	UNK[2]
Score Value	***1***	***7***	***14***	***20***	***27***	***34***	***40***	***20***
Diameter (mm)	100	150	200	250	300	350		
Score Value	***1***	***3***	***5***	***10***	***20***	***30***		

[1] In a few instances, the GIS data identifies both PVC and Non-PVC material types for a single run of pipe and does not make clear distinctions between separate assets. A middle-ground material score is given in this case.
[2] Some assets within the City's database have unknown properties, noted here a UNK = Unknown

The scores identified under the asset scoring matrix are the result of an iterative review with the City. The scores were adjusted and updated through coordination with the City to achieve a score weighting distribution that reflected the critical attributes for consideration and their rehabilitation priorities.

2.3.2 Sanitary and Storm Sewers

The 2020 Storm and Sanitary CCTV Inspections and Condition Assessments report was reviewed to assess the condition of the sanitary and storm systems. The inspection report was completed based on the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) rating system.

Where CCTV inspection information was not available, asset condition was established based on age, material, and size. The City's GIS asset information did not include any maintenance records. In addition to the pipe properties, the sanitary and storm master plans were reviewed to identify any recommended upgrades in the area.

2.3.2.1 Sanitary and Storm Sewer Scoring Criteria

The scoring criteria for the sanitary and stormwater sewers assigned a score for pipe material, age, and diameter.

Material

Polyvinyl Chloride (PVC) sewers are taken to be the baseline material based on the current engineering design standards. Non-Polyvinyl Chloride (PVC) sewer main materials such as Vitrified Clay Tile pipe (VCT) and Corrugated Metal Pipe (CMP) no longer meet current engineering standards as acceptable pipe materials and were assigned higher scores to emphasize their need for replacement.

Age

For pipe age, it was assumed that most of the common materials had a similar expected service life of 60 years. Score scores were allocated based on the remaining service life.

Diameter

For pipe diameter, larger pipes service larger catchment areas and have a greater impact when failure occurs. Larger diameter pipes were assigned higher scores.

Where properties were unknown and not identified in the City's database, scores were assigned to be higher than the lowest risk condition, but not as great as the most significant condition. This is to provide a higher degree of weighting to the unknown areas but without overestimating their severity. **Table 2-6** and **Table 2-7** show the sanitary and storm sewer scoring matrices.

2.3.2.2 Sanitary

The CCTV inspection covered 48 of the 82 sanitary pipe runs within the DRA. The assets were inspected and scored following the PACP rating system and assigned a priority level as shown in **Table 2-5**.

Table 2-5 2020 Sewer CCTV Inspection Rating

Priority	Implication	Condition Grade
1	Repair or Service Immediately	5 and sometimes 4
2	Repair or Service within the next 5 years	3 and 4
3	Re-inspect in 5 to 10 years	1 and 2

The priority scores assigned by ISL were incorporated into the block prioritization factors that are discussed further in **Section 2.5**. Each asset was still assigned a score based on the pipe properties available.

Refer to the "Storm and Sanitary CCTV Inspections and Condition Assessments - 2020" attached in **Appendix D** for the full methodology used in the sewer CCTV condition assessment, and the relevant tables and maps summarizing the location and resulting condition assessment of the inspected sewers.

The sanitary master plan did not include any recommended sanitary sewer upgrades within the DRA.

Based on the City's Minimum Design Standards for Development, it was determined that the majority of the sanitary collection system within DRA was undersized. 57 of the 83 sanitary runs were 200 mm in diameter, while the

minimum diameter for industrial or commercial areas was 250 mm. Based on discussions held with the City there were no sanitary sewer capacity issues in the DRA presently. This suggests that the existing 200 mm diameter sewer was currently sufficient to accommodate flows from the DRA. However, a detailed assessment of the existing sanitary sewer system will be required to assess future capacity requirements and confirm the need for upgrades.

Consequently, the DIRP does not recommend any upgrades to meet the 250 mm minimum diameter on the basis of meeting the specifications alone, nor does it provide the 200 mm diameter assets with any additional score weighting towards this consideration. Only the existing sewer diameter is used when determining asset score. As previously stated, a detailed assessment is recommended to confirm capacity requirements.

Table 2-6 summarizes the scoring breakdown of sanitary sewers based on the pipe properties available.

Table 2-6 Sanitary Sewer Asset Scoring Matrix

Sanitary Asset Scoring Matrix												
Material	PVC	VCT	UNK[1]									
Score Value	***1***	***15***	***5***									
Age Range (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-150	UNK[1]
Score Value	***1***	***7***	***14***	***20***	***27***	***34***	***40***	***47***	***54***	***60***	***67***	***20***
Diameter (mm)	200	250	300	375								
Score Value	***5***	***10***	***20***	***30***								

[1] Some assets within the City's database have unknown properties, noted here a UNK = Unknown

The scores identified under the asset scoring matrix are the result of an iterative review with the City. The scores were adjusted and updated through coordination with the City to achieve a score weighting distribution that reflected the critical attributes for consideration and their rehabilitation priorities.

2.3.2.3 Storm

The storm master plan identified the addition of a 900 mm storm line within the DRA to interconnect two existing parallel sewers along 52 Street. The master plan also identified areas that surcharge to street level during a 1:5-year or greater storm events. These locations were primarily at intersections. For the purposes of the DIRP, the closest adjacent block to the surcharge location was identified as the surcharging area.

Blocks where the master plan recommended a pipe addition are assigned a flat score of 50, as there is no existing infrastructure in the block to assign a score to. Blocks with areas of surface level surcharge were factored into the scoring criteria as discussed in **Section 2.5**. Detailed assessment of each ponding location will be required to identify feasible options for alleviating surcharge issues. Consideration should be given to low impact development stormwater management options, as discussed in **Section 3.5.**

Table 2-7 summarizes the scoring breakdown for storm sewers based on the pipe properties available.

Table 2-7 Storm Sewer Asset Scoring Matrix

Storm Sewer Asset Scoring Matrix												
Material	PVC	VCT	CONC	CMP	UNK[1]							
Score Value	***1***	***20***	***15***	***50***	***5***							
Age Range (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-150	UNK[1]
Score Value	***1***	***7***	***14***	***20***	***27***	***34***	***40***	***47***	***54***	***60***	***67***	**20**
Diameter (mm)	250	300	375	400	450	475	600	750	900	1050	UNK[1]	
Score Value	***1***	***5***	***7***	***10***	***13***	***15***	***20***	***25***	***30***	***35***	***5***	

[1] Some assets within the City's database have unknown properties, noted here a UNK = Unknown

The scores identified under the asset scoring matrix are the result of an iterative review with the City. The scores were adjusted and updated through coordination with the City to achieve a score weighting distribution that reflected the critical attributes for consideration and their rehabilitation priorities.

2.3.3 Score Evaluation

A score based evaluation criteria was developed for the underground infrastructure. The criteria considered asset properties that have a direct impact to estimated and remaining service life, likelihood of failure, and consequence of failure. Each segment of the underground assets was assigned a score, based on the pipe material, age, and diameter. Where multiple pipe segments existed within a block, the highest scoring asset was used selected to define the priority score of the utility.

Though the criteria used is effective in prioritizing underground infrastructure rehabilitation needs, detailed condition inspections will be required to supplement the desktop assessment.

The DIRP blocks and their respective utility scores that are used in the overall block prioritization are summarized in **Table F-1**, located in **Appendix F.**

2.4 Recent Projects

The City's GIS database did not reflect recently completed infrastructure rehabilitated or newly installed assets.

On July 27, 2022, representatives from the City's Engineering Services provided marked-up maps showing recently completed and upcoming infrastructure projects. The maps were reviewed, and the GIS database was updated to include the latest data. Any recently reconstructed or repaired assets were excluded from the rehabilitation consideration of the DIRP.

2.5 Infrastructure Overlap and Consolidation

Once the infrastructure assets (water main, sanitary and storm sewers) were reviewed, analyzed, and scored independently, they needed to be linked together to develop a location-based rehabilitation program. Using GIS-based software, all infrastructure assets were correlated to defined block-by-block segments.

This approach aims to:

- Minimize rework in neighbourhoods resulting in less impact to residents.
- Lower capital costs by taking advantage of economy of scale.
- Increase the City's return on investment on rehabilitation projects.

The City provided direction to emphasize their focus on specific assets. An additional weighting factor is applied to the asset scores to reflect their priorities, shown in **Table 2-8**.

Table 2-8 Utility Weighting Scoring Factor

Utility	Weighting Factor
Water	2.0x
Sanitary	1.5x
Storm	1.0x
Roadways	1.0x
Sidewalks	1.0x

Once weighting factors are applied, the individual scores from each asset class are summed to provide an overall score for the block. A second and final multiplicative factor is applied to the totaled block scores to provide a further degree of granularity to define the block prioritization. This factor placed emphasis on the known condition and severity of underground defects and on outstanding master plan upgrade recommendations.

Priority 1 is given to blocks with any watermain looping upgrades, storm event surface surcharging, or CCTV inspection priority 1 assets. The intent is to prioritize the areas with verified deficiencies, over those that are determined on the basis of the scoring matrix alone.

Priority 2 is given to blocks with the less critical water main upsizing recommendation or CCTV inspection priority 2 assets.

Where there are no master plan recommended upgrades or verified CCTV condition data, assets are categorized as "Unknown".

Priority 3 is given only to two blocks which are defined by having priority 3 CCTV inspection results, as this suggests that at least a portion of the assets within the block are still in serviceable condition.

"Unknown" assets were factored to be of greater importance than Priority 3 assets on the basis that it is more critical to investigate assets of indeterminate condition than it is to address assets of known low concern.

Table 2-9 summarizes the four different block prioritization scoring factors that were used to consolidate all infrastructure assets into blocks.

Table 2-9 Block Prioritization Factors

Block Priority Category	Category Breakout	Score Multiplicative Factor
Priority 1	Master Plan: Watermain Looping Master Plan: 1:5 Year Ponding CCTV Inspection: Priority 1	100x
Priority 2	Master Plan: Watermain Upsizing CCTV Inspection: Priority 2	20x
Unknown	No Master Plan or Inspection Data	5x
Priority 3	CCTV Inspection: Priority 3	2x

3 PROGRAM DEVELOPMENT

3.1 Total Block Scoring

Total score was determined as the sum of the individual asset scores for the underground and surface infrastructures within a road section, multiplied by the applicable factors as described in **Section 2.5**. Combining surface and underground scores was key in prioritizing and grouping rehabilitation projects. Scoring was weighted towards prioritizing rehabilitation in areas with known underground deficiencies. The higher the total block score, the greater the significance of the assets and need for prioritization.

3.2 Rehabilitation Recommendations

The limited information on asset condition within the DRA meant that certain rehabilitation recommendations may end up being overly conservative or aggressive and may not reflect the actual underground infrastructure condition. To provide a balanced assessment, High-Cost and Low-Cost Scenarios were developed for all blocks within the DRA.

3.2.1 High-Cost

The **High-Cost Scenario** assumes a "worst-case" situation, where all underground assets within a block will require full removal and replacement. This scenario assumes full replacement of all underground assets and remediation of the roadway, only up to the granular surface. This approach provides a degree of proactive mitigation to prevent further deterioration of infrastructure, as every asset will eventually be replaced.

The anticipated construction cost for the **High-Cost Scenario** is **$22.8M**. **Table F-2**, in **Appendix F**, summarizes the scope and anticipated construction cost for the High-Cost Scenario sorted by the total block score.

3.2.2 Low-Cost

The **Low-Cost Scenario** assumes an ideal situation where only blocks with assets identified for replacement, either through a recommended master plan upgrade or a CCTV inspection recommendation from ISL will be considered for rehabilitation. No other assets will be included for rehabilitations on the assumption that they are still in serviceable condition. This is considered to be the ideal scenario as it assumes that all assets of unknown condition will not require replacement.

The anticipated construction cost for the **Low-Cost Scenario** is **$11.5M**. **Table F-3**, located in **Appendix F,** summarizes the scope and anticipated construction cost of the Low-Cost Scenario sorted by the total block score, which is calculated as the sum of the individual asset scores within a road section (Street ID) and the applied scoring factors.

3.2.3 City of Camrose Asset Rehabilitation Approach

The City of Camrose explained that their standard approach to underground asset rehabilitation is to address all utilities at the same time. Where one type of underground assets is identified for replacement, all of the other adjacent utilities within the block are also flagged for replacement.

The implication of this for the DIRP is that blocks in the Priority 1 category, those defined with a clear need of replacement by masterplan or CCTV, will maintain similar costs in both the High-Cost and Low-Cost Scenarios, while the other categories will present significantly lower costs in the Low-Cost Scenario.

It is our understanding that the City operates separate budgets for roadway/surface improvements and underground utilities. As this report focuses on the renewal of underground infrastructure, the surface rehabilitation work is excluded from the opinions of probable cost.

3.2.4 Inspection Program

It is recommended that the City implement an annual Condition Assessment Program to inspect and verify the conditions of critical assets and high priority areas in advance of carrying out replacement work identified in the DIRP. Verifying asset condition will provide the necessary information for the City to continuously update the program. Additionally, this will allow the City to adjust the planned rehabilitation method, based on actual asset condition, which will be key to accurately forecasting project budgets.

The 2020 CCTV inspection programs provided asset condition records for 60% of the sanitary mains and 3% of the stormwater sewers within the downtown area. Based on this, a total of 2,900 m of sanitary and 4,000 m of stormwater sewers have unknown conditions. Implementing an annual inspection program will allow for proactive project planning and provide the following benefits:

- Assessment of specific critical assets to confirm rehabilitation requirements.
- Verification that critical assets are in functional condition, which allows reallocation of budget to other projects.
- Identification of the remediation needs for critical assets to facilitate project design and planning.
- Facilitates prioritization of utility rehabilitation.

A 10-Year Condition Assessment Program is proposed for the underground assets. This will allow underground assets to be inspected over a 10-year period. **Table 3-1** below provides a summary of the proposed program.

Table 3-1 Proposed Condition Assessment Program

Scope for Sewer Inspection	Estimated Quantity/Cost
Total Length of Sanitary Sewers to be Inspected	2,900 m
Total Length of Stormwater Sewers to be Inspected	4,000 m
Total - Sewers	**6,900 m**
Total Cost of Inspection Program (Based on $60/m average rate)	**$414,000**
Length of Sewers to be Inspected per Year (Based on 10 – Year Program)	690 m
Annual Inspection Budget	$41,400

3.3 Program Cost Projections

The opinion of probable cost for the replacement and rehabilitation value of infrastructure assets were based on of the following sources:

- Rates for removal and replacement of underground infrastructure were based on those from similar projects recently completed in the City of Camrose.

- Rates to address storm ponding were based on similar inline and underground storage projects quoted recently.

Table 3-2 summarizes the anticipated construction costs and assets based on the block priority category for the overall DRA.

Table 3-2 Block Categorization Asset Summary

Priority	High-Cost Total	Low-Cost Total	# of Blocks	Total Watermain Length	Total Sanitary Sewer Length	Total Storm Sewer Length
1	$11,357,000	$10,116,000	28	3452	3374	1489
2	$3,999,000	$1,394,000	11	1320	1449	961
3	$219,000	$5,000	2	112	132	76
Unknown	$7,215,000	$0	27	2332	2310	1648
Total	**$22,790,000**	**$11,515,000**	**68**	**7216**	**7265**	**4174**

Figure 3-1 presents the construction cost breakout based on the block priority categorization.

Figure 3-1 Block Categorization Asset Summary

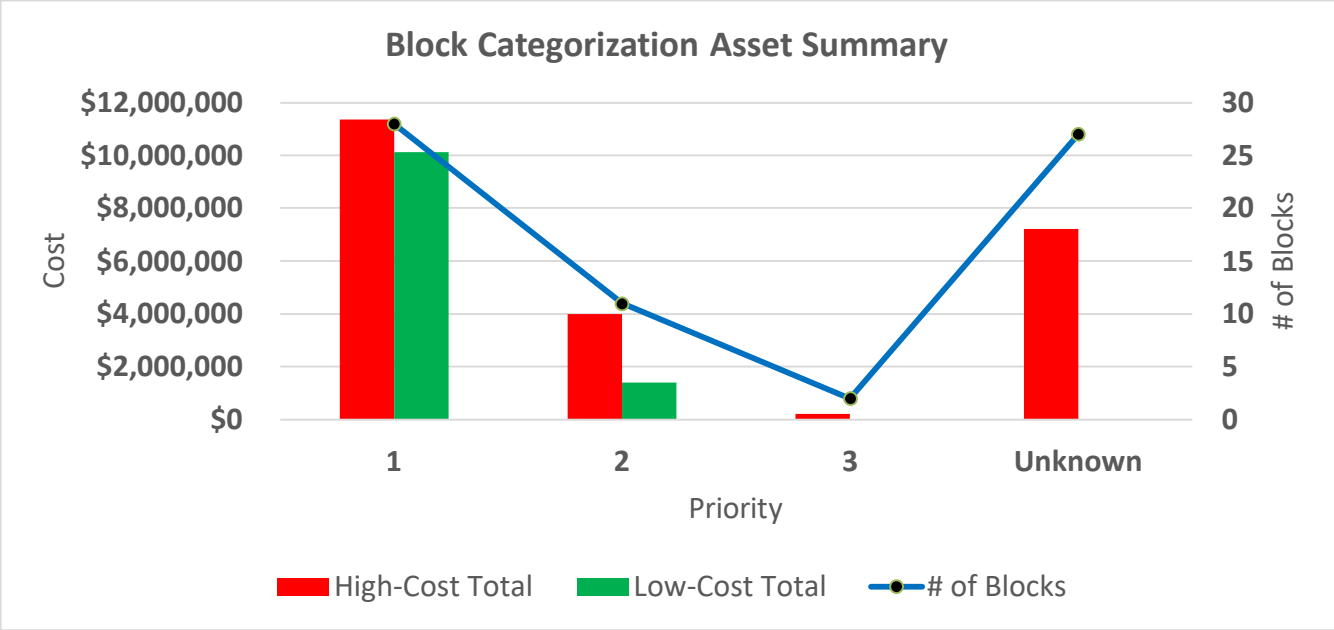


Table F-4, in Appendix F, summarizes the consolidated infrastructure assets with High-Cost and Low-Cost Scenarios sorted by the total block score.

3.4 Program Block Prioritization

The 25-year DIRP was organized to provide a recommended block rehabilitation phasing plan in 3-year increments. This was to provide the City with construction sequencing and budgeting flexibility.

Prioritization of the block rehabilitation within the DRA was conducted based on score, cost, location, and proximity to other projects. Block phasing was completed based on the High-Cost Scenario (full rehabilitation) at a total anticipated construction cost of $22.8M for 68 blocks. Broken out over 25 years, this amounts to approximately **$0.9M** per year, or **$2.7M** per 3-year phase. The phasing program groups contiguous blocks of similar priority levels, where the budget permits. This is important to minimize future disruptions, and limit project mobilization and demobilization costs. **Table 3-3** provides a summary of the multi-year rehabilitation phasing program.

Table 3-3 Multi-Year Rehabilitation Program Summary

Rehabilitation Years	Number of Blocks	Total Block Infrastructure High-Cost	Total Block Infrastructure Low-Cost	Length of Watermain (m)	Length of Sanitary Sewer (m)	Length of Storm Sewer (m)
2023-2025	8	$3,282,000	$2,425,000	798	791	612
2026-2028	9	$2,678,000	$1,859,000	613	1147	370
2029-2031	7	$3,055,000	$2,845,000	909	655	435
2032-2034	6	$2,731,000	$2,599,000	842	617	348
2035-2037	9	$2,186,000	$1,238,000	807	1087	520
2038-2040	6	$2,855,000	$80,000	768	973	639
2041-2043	9	$2,630,000	$428,000	1158	860	492
2044-2047	14	$3,373,000	$41,000	1321	1135	758
DIRP Total:	**68**	$22,790,000	$11,515,000	7216	7265	4174

Figures E-1 to **E-10** in **Appendix E** present the locations of the blocks identified in the phased rehabilitation plan. **Table F-5**, located in **Appendix F**, presents a more detailed summary of the multi-year block rehabilitation phasing plan and opinion of probable cost.

3.5 Master Plan Works

A review of the City's 2006 Water Master Plan, 2007 Sanitary Master Plan, and 2008 Stormwater Master Plan was undertaken to identify locations where recommended system upgrades overlapped with deteriorating infrastructure. This was done to ensure that all underground replacements considered future requirements for upsizing or expansion. **Section 2.3** and **Section 2.5** discuss how master plan upgrades were assessed in the asset scoring and block prioritization processes.

Upgrades related to master plan recommendations were integrated into the overall DIRP opinion of probable cost. As master plan upgrades are specifically defined improvements, they are the same in the Low-Cost and High-Cost opinion of probable cost. **Table 3-4** presents a summary of the master plan costs by utility type.

Table 3-4 Master Plan Upgrade Costs

Master Plan Upgrades	High-Cost	Low-Cost
Water	$1,598,000	$1,598,000
Sanitary Sewer	$0	$0
Stormwater Sewer	$4,838,000	$4,838,000
Total Master Plan Upgrades	**$6,436,000**	**$6,436,000**

Table F-6, located in **Appendix F**, provides a detailed breakout of the details and opinion of probable construction cost for the specific master plan related upgrades. This includes any incidental renewal work associated with the master plan upgrades, including replacement of existing adjacent infrastructure for the same utility i.e., replacement of storm sewers when addressing surcharging. The total anticipated construction cost for all master plan related upgrades is **$6.4M**.

3.5.1 Water Upgrades

The water master plan identified 10 block improvements within the DRA:

- 4x installation of new water mains to expand looping.
- 6x replacement and upsizing of existing water mains.

The total anticipated construction cost for water master plan upgrades is **$1.6M**.

3.5.2 Sanitary Upgrades

The sanitary master plan focusses on sanitary trunk lines and does not identify any upgrades to the sanitary system within the DRA.

3.5.3 Stormwater Management Upgrades

The existing minor system is a complex network of parallel and interconnected sewers and manholes, resulting in an unoptimized drainage system. These storm sewers were originally designed for the 1:2-year to the 1:5-year storm events, without consideration for the major drainage system. The current City standards require that the minor drainage system be designed for the 1:5-year storm event, and the major drainage system be designed for the 1:100-year storm event. The result is that relatively small storm events cause the minor system capacity to be exceeded, and water surcharges to the surface where it is trapped until the system clears and is able to drain it. There are a number of locations across the DRA that are prone to this surface level surcharging. These areas are identified on **Figure E-11** in **Appendix E**.

The master plan does not identify the specific surcharge ponding volumes associated with 1:5-year events but indicates ponding volumes of 150 m^3 – 1800 m^3 for 1:100-year events. These 1:100-year event volumes are so substantial that any means of completely mitigating the ponding becomes very costly due to the complexity and space constraints of working in the downtown core. In the absence of specific ponding volumes for the 1:5-year events, volumes of 150 m^3 were assumed for each instance of surface level ponding for cost estimating purposes. A rate of $3000/$m^3$ was carried for stormwater management improvements, amounting to $450,000 per instance of ponding.

This estimate may vary greatly based on the specific location of ponding and depending on the approach taken by the City to address the issue.

Any significant improvements to the major drainage system within downtown would be very challenging, consequently one recommended approach is to upgrade the minor system to reduce pipe surcharging and limit surface level flooding. One method to achieve this is to interconnect the currently parallel and separate storm sewer networks to better utilize the available capacity. The stormwater master plan identified one such improvement within the DRA, the extension of a 900 mm storm sewer to interconnect the storm systems between 48 Ave and 48A Ave on 52 Street.

The anticipated construction cost for storm master plan upgrades could range from **$4.8M** and beyond.

3.5.3.1 Stormwater Management Options

A detailed analysis of the major and minor drainage systems within the DRA is required to determine the best means of addressing the existing capacity and flooding issues. The existing utility and space constraints of downtown will require thorough consideration to determine how potential stormwater management facilities could be implemented. Based on the stormwater master plan, the source of surface ponding in the downtown area is an unoptimized minor drainage system, and a poorly planned major drainage system. For the purposes of this report, the following section will provide a high level discussion on some of the potential mitigation options that may be able to help address these issue.

Major Drainage Improvements

Improvements to the major drainage system could enhance runoff conveyance into more capable stormwater management facilities or areas with a higher capacity minor drainage system. Reducing the amount of water entering the minor drainage system in the areas of ponding could lower the volume in the system and reduce the frequency of surface surcharging. Similarly, minimizing the trapped low areas could allow for surface level surcharge to be collected and conveyed by the major drainage system, reducing, or eliminating the localized flooding.

Minor Drainage Improvements

As discussed in **Section 3.5.3**, the current minor drainage system in downtown is composed of a complex network of sewers, manholes, and catch basins. Some form independent pipe systems, while others interconnect. One approach to the drainage issues is to increase the interconnectivity of the various storm sewer systems. Where possible, parallel systems can be connected to maximize the available capacity.

Another potential option would be to upsize the existing sewers. Increasing sewer capacity would further reduce the frequency at which the storm sewer surcharges. The minor drainage system could also be supplemented with inline storage facilities to increase the available capacity of the sewer system prior to surcharging.

Other means of reducing runoff into the minor drainage system include water detention systems such as roof top storage, and surface detention measures. Temporary surface storage facilities for stormwater could be located in parking lots or other lower risk areas, reducing surface level flooding near private properties.

For future development in the DRA, it is also recommended that allowable discharge from private property into the public storm system be rate limited. Mandated rates of release, or requirements for onsite stormwater storage could also help alleviate contributing to any future capacity issues of the existing system.

Low Impact Development (LID) Improvements

The Downtown Area Redevelopment Plan (DARP) emphasizes sustainability as an important objective in the future development of Camrose. The use of LID features for stormwater management is one of the ways in which this sustainability goal can be achieved. LID features are a type of stormwater management facility that incorporate plants, engineered soils, and natural processes to capture and detain stormwater runoff close to its source. They can help to alleviate the capacity and subsequent surcharging issues in the minor drainage system is by reducing the amount of water that enters into the minor drainage system. Some of the benefits of LID features compared to conventional stormwater management practices include:

- Reduced erosion and sedimentation in receiving waterbodies.
- Less water quality degradation that occurs due to sediment and pollutant introduction.
- More small scale and incorporated through an area.
- More aesthetically integrated into urban streetscapes.

The City of Edmonton's Low Impact Development Best Management Practices Design Guide (2014) provides an overview of LID practices with considerations for the cold northern climate, including potential LID facility options:

Bioretention/Rain Gardens

Shallow depressions that use vegetation and amended topsoil to reduce runoff, provide water quality treatment, and allow for infiltration near where runoff originates. Can be designed to infiltrate water to surrounding soils or connect to storm sewers through an underdrain.

Bioswales/Vegetated Swales

Swales with grass and other vegetation, enhanced topsoil, and an underlying infiltration layer. Designed to convey and slow runoff, allowing for increased infiltration, evaporation, transpiration, and water quality improvement prior to connecting to another stormwater management facility.

Green Roof

Live vegetation established on top of buildings, composed of a drainage layer, growing medium, and vegetated layer. Designed to reduce runoff from roofs, allowing for increased infiltration, evaporation, transpiration, and water quality improvement before connecting to another stormwater management facility.

Infiltration Box Planters

Similar to bioretention systems as they use vegetation and amended soils to filter and retain stormwater. They are typically located along the length of a corridor, such as the boulevards of a roadway. Box Planters can be designed to reduce runoff volume via allowing for increased infiltration, evaporation, transpiration, and water quality improvement prior to connecting to the minor drainage system. Water typically enters the planter through a curb cut where it must infiltrate through layers of mulch and soil before it continues to infiltrate into surrounding soils and the groundwater table or is conveyed via an underdrain to the minor storm system.

4 PROGRAM COST SUMMARY

4.1 Downtown Infrastructure Renewal Plan (DIRP)

The opinion of probable construction High-Cost for the DIRP is **$22.8M**, which includes the removal and replacement of all underground assets within the DRA. The opinion of probable construction Low-Cost for the DIRP is **$11.5M**, which includes rehabilitation of underground and surface assets of known condition and assumes no rehabilitation work is required for the presently unknown assets. The true budget is expected to be somewhere between the two extremes. The extent of rehabilitation and actual cost are to be determined following additional asset condition assessment and detailed design consideration.

Each DIRP year is allocated engineering fees of 12% of the anticipated construction costs. These costs should cover the preparation of the design and tender packages for the subsequent year's projects, including any additional data collection, pre-design, and detailed design required for a rehabilitation project.

An Emerging Issues Fund of 5% of the anticipated construction costs is allocated for each program year to cover potential scope creep that typically arises during implementation of a renewal program.

A Contingency fund of 20% of the anticipated construction costs is allocated for each program year to cover fluctuation in the construction market, and potential costs unforeseen during pre-design stages.

The opinion of probable total High-Cost for the DIRP is **$31.2M**, and the opinion of probable total Low-Cost is **$15.8M**. To address all infrastructure assets under the 25-year renewal plan, this amounts to an annual expenditure of approximately **$1.25M**.

The 25-year DIRP was organized to provide a recommended block rehabilitation phasing plan in 3-year increments. This was to provide the City with construction sequencing and budgeting flexibility. **Table 4-1** summarizes the opinion of probable cost for the 2023-2047 DIRP including approximate construction costs, engineering fees, emerging issues fund, and contingency fund. **Table 4-2** summarizes the recommended first three years of the DIRP for 2023-2025.

Table 4-1 DIRP Opinion of Probable Cost Summary

Description	2023-2025	2026-2028	2029-2031	2032-2034	2035-2037	2038-2040	2041-2043	2044-2047	DIRP TOTAL
Construction High-Cost	$3,282,000	$2,678,000	$3,055,000	$2,731,000	$2,186,000	$2,855,000	$2,630,000	$3,373,000	$22,790,000
Engineering (12%)	$394,000	$321,000	$367,000	$328,000	$262,000	$343,000	$316,000	$405,000	$2,736,000
Emerging Issues Fund (5%)	$164,000	$134,000	$153,000	$137,000	$109,000	$143,000	$132,000	$169,000	$1,141,000
Contingency (20%)	$656,000	$536,000	$611,000	$546,000	$437,000	$571,000	$526,000	$675,000	$4,558,000
High-Cost Scenario Total	**$4,496,000**	**$3,669,000**	**$4,186,000**	**$3,742,000**	**$2,994,000**	**$3,912,000**	**$3,604,000**	**$4,622,000**	**$31,225,000**
Construction Low-Cost	$2,425,000	$1,859,000	$2,845,000	$2,599,000	$1,238,000	$80,000	$428,000	$41,000	$11,515,000
Engineering (12%)	$291,000	$223,000	$341,000	$312,000	$149,000	$10,000	$51,000	$5,000	$1,382,000
Emerging Issues Fund (5%)	$121,000	$93,000	$142,000	$130,000	$62,000	$4,000	$21,000	$2,000	$575,000
Contingency (20%)	$485,000	$372,000	$569,000	$520,000	$248,000	$16,000	$86,000	$8,000	$2,304,000
Low-Cost Scenario Total	**$3,322,000**	**$2,547,000**	**$3,897,000**	**$3,561,000**	**$1,697,000**	**$110,000**	**$586,000**	**$56,000**	**$15,776,000**

Table 4-2 2023-2025 DIRP Summary

2023-2025 Block Rehabilitation Summary									
AE Block Number	21	24	25	26	27	29	40	59	TOTAL
Block Name	R49a48s50s	R48Aa52As53s	R48Aa52s52As	R48Aa51s52s	R48Aa50s51s	R48Aa48s49s	R52s48a48Aa	R48s49a50a	
Construction High-Cost	$729,000	$152,000	$321,000	$384,000	$576,000	$105,000	$749,000	$266,000	$3,282,000
Engineering (12%)	$87,000	$18,000	$39,000	$46,000	$69,000	$13,000	$90,000	$32,000	$394,000
Emerging Issues Fund (5%)	$36,000	$8,000	$16,000	$19,000	$29,000	$5,000	$37,000	$14,000	$164,000
Contingency (20%)	$146,000	$30,000	$64,000	$77,000	$115,000	$21,000	$150,000	$53,000	$656,000
High-Cost Scenario Total	**$998,000**	**$208,000**	**$440,000**	**$526,000**	**$789,000**	**$144,000**	**$1,026,000**	**$364,000**	**$4,496,000**
Construction Low-Cost	$729,000	$0	$0	$0	$576,000	$105,000	$749,000	$266,000	$2,425,000
Engineering (12%)	$87,000	$0	$0	$0	$69,000	$13,000	$90,000	$32,000	$291,000
Emerging Issues Fund (5%)	$36,000	$0	$0	$0	$29,000	$5,000	$37,000	$14,000	$121,000
Contingency (20%)	$146,000	$0	$0	$0	$115,000	$21,000	$150,000	$53,000	$485,000
Low-Cost Scenario Total	**$998,000**	**$0**	**$0**	**$0**	**$789,000**	**$144,000**	**$1,026,000**	**$364,000**	**$3,322,000**

4.2 City-Wide Infrastructure Renewal Plan and Comparison

Concurrently with the preparation of the DIRP, Associated Engineering was retained by the City to develop a 25-year city-wide infrastructure replacement plan (CIRP). The CIRP spans the entirety of the City and excludes the downtown area covered under the DIRP.

Tables 4-3 and **4-4** below summarize the budget opinions of probable cost for the **High-Cost** and **Low-Cost Scenarios** for the CIRP and DIRP, respectively. The tables also show the annual average budgets, based on 25-year programs. The opinion of probable total cost for the combined High-Cost and Low-Cost Scenarios for the CIRP and DIRP is **$177,648,000** and **$88,988,000**, respectively. The baseline Annual Average Budget (based on 25 years) for the High-Cost and Low-Cost Scenario is **$7,106,000** and **$3,561,000**, respectively.

The costs presented include engineering fees estimated at 12% of the construction costs, which covers data collection, pre-design, and detailed design requirements for the preparation of subsequent year's projects. The opinion of probable cost also includes a nominal budget equivalent to 5% of the construction cost for emerging issues to cover potential scope creep that typically arises during implementation of a renewal program. A 20% contingency allowance was estimated to cover fluctuation in the construction market, and potential costs unforeseen during pre-design stages.

Table 4-3 High-Cost Scenario – Summary of Opinion of Probable Cost for 25-Year CIRP and DIRP

	Description	Baseline Annual Average Budget (Based on 25 Years)	Total over 25 Years (2023 Dollars)
City-wide Infrastructure Replacement Plan	Construction Cost	$4,275,000	$106,878,000
	Engineering, Investigations, Program Re-evaluation/Update (12%)	$513,000	$12,825,000
	Emerging Issues Fund (5%)	$214,000	$5,344,000
	Contingency (20%)	$855,000	$21,376,000
	Total – CIRP	**$5,857,000**	**$146,423,000**
Downtown Infrastructure Renewal Plan (DIRP)	Construction Cost	$912,000	$22,790,000
	Engineering, Investigations, Program Re-evaluation/Update (12%)	$109,000	$2,736,000
	Emerging Issues Fund (5%)	$46,000	$1,141,000
	Contingency (20%)	$182,000	$4,558,000
	Total – DIRP	**$1,249,000**	**$31,225,000**
	Grand Total High-Cost Scenario – CIRP and DIRP	**$7,106,000**	**$177,648,000**

Table 4-4 Low-Cost Scenario – Summary of Opinion of Probable Cost For 25-Year CIRP and DIRP

	Description	Baseline Annual Average Budget (Based on 25 Years)	Total over 25 Years (2023 Dollars)
City-wide Infrastructure Replacement Plan	Construction Cost	$2,138,000	$53,439,000
	Engineering, Investigations, Program Re-evaluation/Update (12%)	$257,000	$6,413,000
	Emerging Issues Fund (5%)	$107,000	$2,672,000
	Contingency (20%)	$428,000	$10,688,000
	Total - CIRP	**$2,930,000**	**$73,212,000**
Downtown Infrastructure Renewal Plan (DIRP)	Construction Cost	$461,000	$11,515,000
	Engineering, Investigations, Program Re-evaluation/Update (12%)	$55,000	$1,382,000
	Emerging Issues Fund (5%)	$23,000	$576,000
	Contingency (20%)	$92,000	$2,303,000
	Total - DIRP	**$631,000**	**$15,776,000**
	Grand Total High-Cost Scenario - CIRP and DIRP	**$3,561,000**	**$88,988,000**

4.3 Condition Assessment Program

It is recommended that the City establishes an annual Condition Assessment Program to verify the condition of underground assets, in support of rehabilitation and replacement planning. The proposed program will run in conjunction with both the CIRP and DIRP. **Table 4-5** summarizes the sewer inspection programs for the DIRP and CIRP.

Table 4-5 Summary of Opinion of Probable Cost For Proposed Condition Assessment Program

Scope for Sewer Inspection	CIRP Estimated Quantity/Cost	DIRP Estimated Quantity/Cost
Total Length of Sanitary Sewers to be Inspected	27,775 m [1]	2,900 m
Total Length of Stormwater Sewers to be Inspected	23,225 m [1]	4,000 m
Total - Sewers	**51,000 m**	**6,900 m**
Total Cost of Inspection Program (Based on $60/m)	**$3,060,000**	**$414,000**
Length of Sewers to be Inspected per Year (Based on 10 – Year Program)	5,100 m	690 m
Annual Inspection Budget	**$306,000**	**$41,400**

[1] Only high priority sewers are included in the CIRP quantity estimate. Refer to the Camrose Infrastructure Replacement Plan report for details.

4.4 Annual Budget Allocation Options

To facilitate decision making, an analysis of annual budget allocation options was undertaken, based on the corresponding durations to complete both the CIRP and the DIRP. **Figure 4-1** and **Figure 4-2** below present the budget allocation options for the High-Cost and Low-Cost Scenarios, respectively. The options presented assume that the total annual budget allocation will be split between the CIRP and DIRP on the removal and replacement (R&R) of underground assets. This will allow the CIRP and DIRP to be executed simultaneously.

Figure 4-1 Budget Allocation Options for High-Cost Scenario

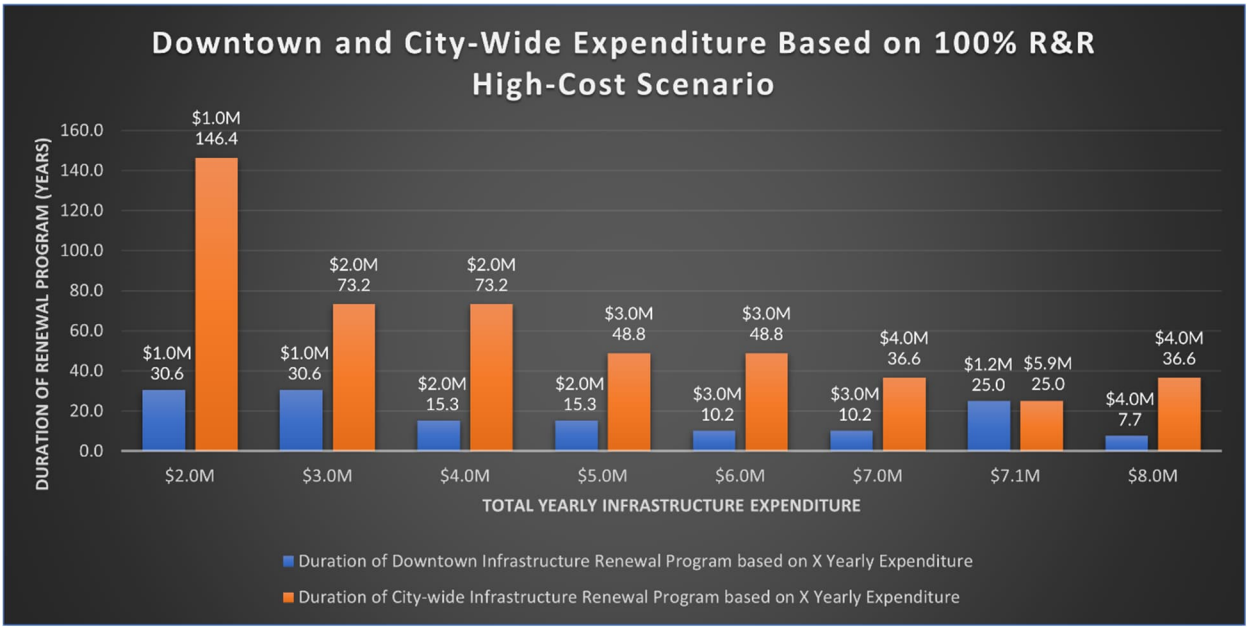
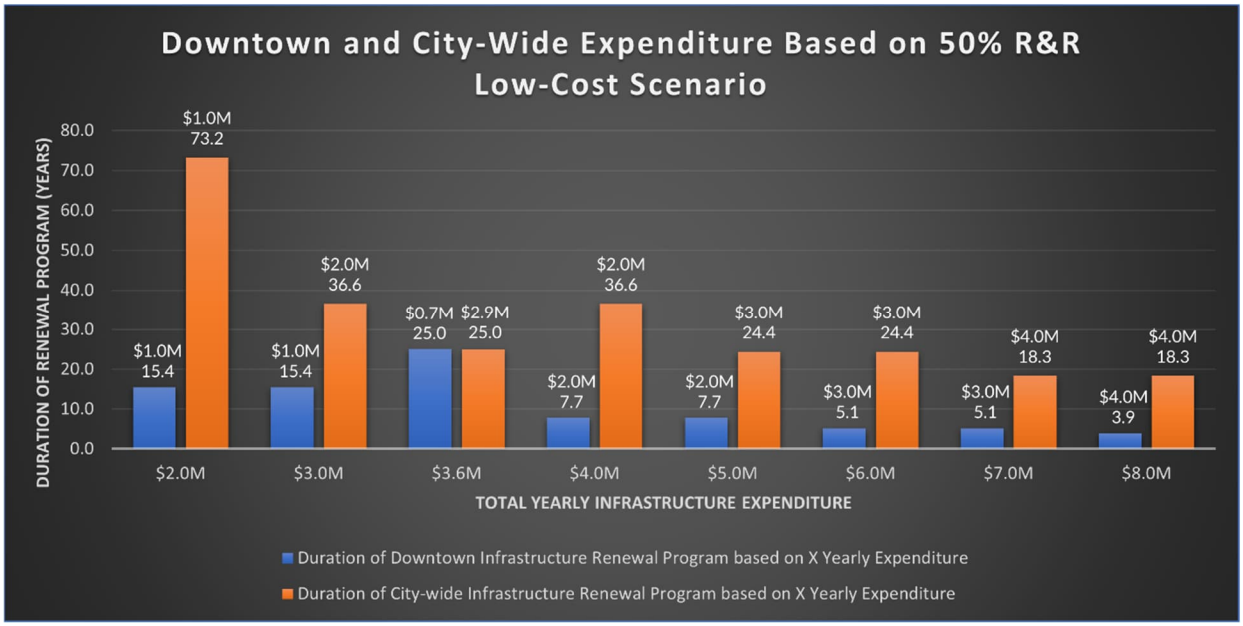


Figure 4-2 Budget Allocation Options for Low-Cost Scenario



Based on the analysis summarized in **Figure 4-1** and **Figure 4-2**, the following should be considered in deciding the preferred budget allocation:

1. The smaller the budget, the longer it will take to complete the replacement programs. This will lead to further deterioration of infrastructure condition and increased risk of failure.
2. A larger budget allocation will allow replacement of more infrastructure assets. The replacement program can be completed in relatively shorter time, which will address deterioration and minimize the risk of failure.

Based on the above analysis, a baseline Annual Average Budget based on a 25-year implementation period is recommended. The total annual budget allocation should range from **a minimum of $3,561,000 (Low-Cost Scenario) to a maximum of $7,106,000 (High-Cost Scenario)**.

5 ANALYSIS SUMMARY

1. High priority projects identified for the DIRP are determined based on roadway condition assessments, water break history, CCTV surveys of sanitary and stormwater sewers, and upgrades identified from master plans.
2. The projects identified in the 2023-2047 DIRP were prioritized using a score based methodology that is centered on asset properties to approximate asset condition and consequence of failure.
3. The DIRP methodology prioritizes areas with verified deficiencies over those that are estimated based on asset properties alone.
4. Within the DRA, 41 of 68 blocks have verified conditions or include a master plan recommended upgrade. The remaining blocks are evaluated based on asset properties alone.
5. The DIRP allows 7.2 km of water mains, 7.3 km of sanitary and 4.2 km of stormwater sewers to be rehabilitated.
6. The total construction budget for costs relating to master plan upgrades is **$6,436,000**.
7. The overall High-Cost budget for the DIRP is **$31,225,000**.
8. The overall Low-Cost budget for the DIRP is **$15,776,000**.
9. To rehabilitate all assets within the DRA over the 25-year plan, an annual budget of approximately $**1.25M** will be required.

The process undertaken to develop a 25-year DIRP leads to the conclusion that the City requires approximately $**1.25M** per year to address aging infrastructure in the DRA. A 3-year capital program cycle is proposed to allow some flexibility in the annual allocation of the budget to accommodate adjustments in project limits. Overall, the data suggests **$15.8M** to **$31.2M** is necessary to address all the infrastructure analyzed in the DRA. While this is conceivable over a 25-year program, it is daunting, and subject to significant variability. While the process used to prioritize the individual blocks is based on an analytical hierarchy, it is still subject to gaps in data that could change the evaluation or prioritization. As such it is prudent for the City of Camrose to re-evaluate the program on a regular cycle, while continuously updating data with current condition assessments. A significant portion of the infrastructure evaluated is of unknown condition; and therefore, skews results. This is not unusual, in most cases if systems are working it is generally accepted that rehabilitation is not required.

The study also applies general rehabilitation strategies at a high level. Once a project is identified, detailed engineering analysis must be undertaken to determine the appropriate rehabilitation strategy and identify the most cost-effective solutions. There are areas that do not meet the City's current development standards, but this alone should not be the warrant for rehabilitation. Functionality and sustainability must be considered in the determination of the rehabilitation.

Downtown redevelopment will ultimately impact the priority of rehabilitation in the DRA. The redevelopment is intrusively linked to the infrastructure capacity; that is, redevelopment may force infrastructure upgrades or capacity limitation may limit redevelopment options. As such, the City will need to consider the DIRP with their plans for the redevelopment of downtown and adjust the priorities accordingly.

6 RECOMMENDATIONS

The following recommendations are made:

1. Implementation of 25-Year CIRP and DIRP at a total budget allocation ranging from a minimum of **$88,988,000** (Low-Cost Scenario) to a maximum of **$177,648,000** (High-Cost Scenario).
2. Total **annual** budget allocation for the CIRP and DIRP ranging from a minimum of **$3,561,000** (Low-Cost Scenario) to a maximum of **$7,106,000** (High-Cost Scenario).
3. Implementation of the proposed 2023-2025 DIRP at a budget of **$3.3M** to **$4.5M** over three years. Refer to **Table 4-2** in **Section 4** for cost break down, and **Figure E-3** in **Appendix E** for a map of the proposed blocks for rehabilitation.
4. Implementation of a 10-Year Condition Assessment Program to verify the condition of underground assets at a total cost of **$3,060,000** for the CIRP and **$414,000** for the DIRP.
5. Allocation of a portion of the annual budget for engineering fees for the preparation of the **design and tender packages** for the subsequent year's projects. These costs should cover any additional data collection, pre-design, and detailed design required for a rehabilitation project. An allowance equivalent to 12% of the anticipated construction costs is recommended.
6. Allocation of a portion of the annual budget to addressing emerging issues. This will cover potential scope creep that typically arises during implementation of a renewal program. An allowance equivalent to 5% of the anticipated construction costs is recommended.
7. The City should retain a portion of each year's uncommitted budget for a contingency fund to cover fluctuation in the construction market, and potential costs unforeseen during pre-design stages. An allowance equal to 20% of the anticipated construction costs should be considered.
8. The City should implement a CCTV Inspection Program to verify the condition of underground assets at a total cost of **$414,000**. This program can be implemented on a 10-year timeline.
9. The City should review the 25-year DIRP on 3-year cycles, based on condition assessment data, and re-prioritizing infrastructure needs.
10. The City should consider additional identification labels for their GIS system to group underground assets by geographic location and roadway. Presently, there is no intuitive way of connecting underground assets with their location aside from visually in GIS maps. This could provide an improved means of tracking surface and underground project overlaps.
11. Concurrently with the preparation of this report, the City continued with their utility upgrade and replacement planning within the Downtown Redevelopment Area. In locations where the City has planned for piecemeal utility upgrades or replacements, it is recommended that they consider addressing all underground utilities at once. This will reduce the amount of required traffic disruptions and minimize surface infrastructure rework.

CLOSURE

This report was prepared for the City of Camrose to provide program development information and data for the 2023-2047 Downtown Infrastructure Renewal Plan.

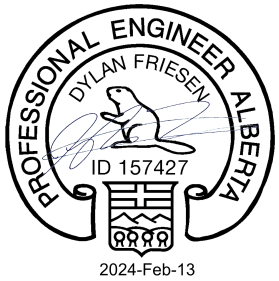
The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

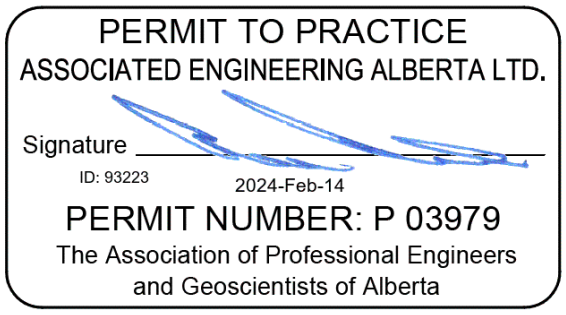
Associated Engineering Alberta Ltd.



Nelson Dos Santos, P.Eng.
Project Manager



Dylan Friesen, P.Eng.
Project Engineer



APPENDIX A - SURFACE MODEL ACTIVE CORRIDOR CROSS SECTIONS DRAFT TECHNICAL MEMORANDUM

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

TECHNICAL MEMORANDUM

Issue Date:	July 31, 2020	**File No.:**	2020-3737
To:	Jeremy Enarson, P.Eng. Manager, Engineering Services	**Previous Issue Date:**	
From:	Carlie Pittman, P.Eng.	**Project No.:**	2020-3737
Client:	City of Camrose		
Project Name:	Downtown Infrastructure Renewal Plan		
Subject:	Surface Model Active Corridor Cross Sections		

DRAFT

1 INTRODUCTION

The City of Camrose developed a plan to guide the redevelopment of the downtown area for the next 25 years. This plan, the Downtown Area Redevelopment Plan (DARP), was adopted by City Council in the spring of 2019. As a part of the DARP Study, the City performed a preliminary in-house review of the surface and underground infrastructure within the public rights-of-way.

Associated Engineering was engaged to complete the Downtown Infrastructure Renewal Plan Project in March of 2020. The scope of the project requires the development of a Renewal Plan for the municipal infrastructure in the downtown redevelopment area. The Renewal Plan includes a review of existing surface infrastructure and the development of a surface model that meets requirements outlined in the DARP. Also included is a review of the various master planning documents and development of an underground infrastructure model. The purpose of this technical memorandum is to summarize our review and technical assessment of the cross sections developed in the DARP and make recommendations for any modifications to these sections prior to adopting the sections and building out the surface model for the Downtown Infrastructure Renewal Plan.

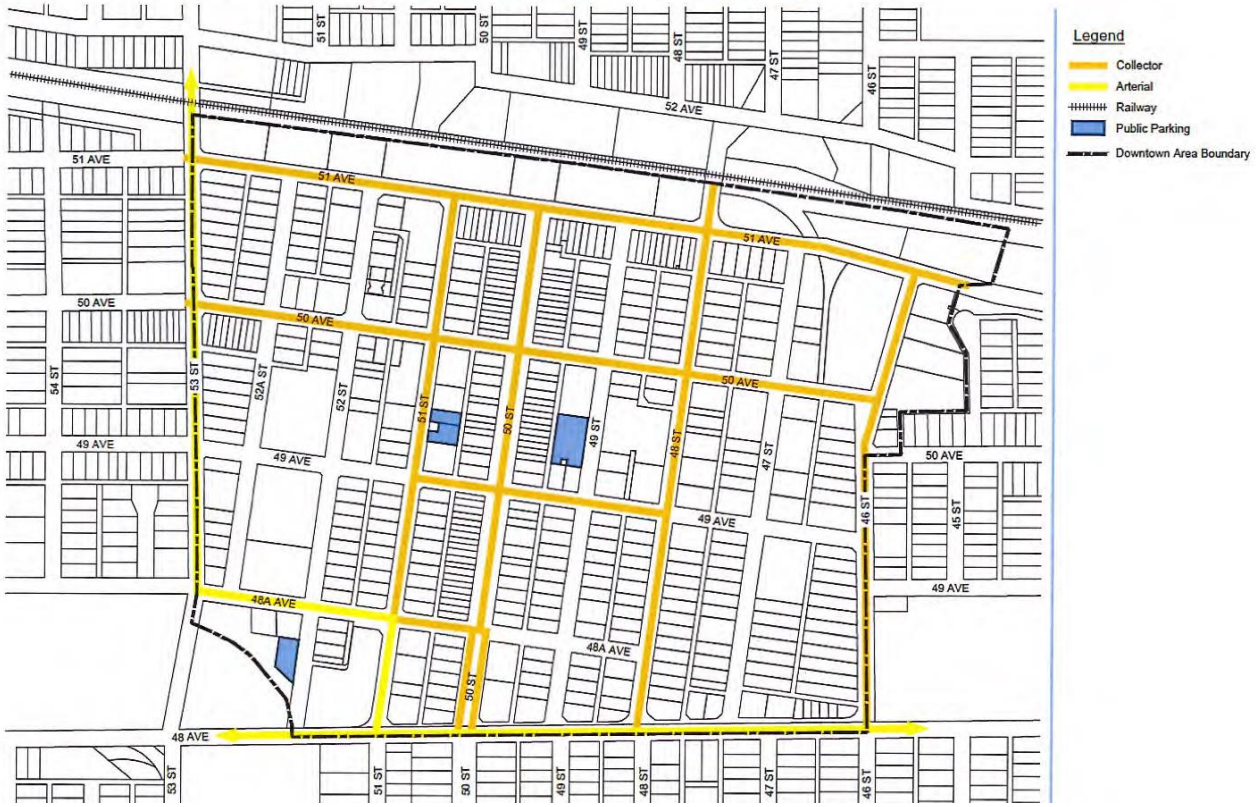
2 EXISTING ROADWAYS

The existing Transportation network is shown in **Figure 1** and is composed of Collector and Arterial roadways. All street and avenues within the Downtown Area Boundary have a ROW width of 20.12 m (66 ft) except for 50th Street (Main Street) which has a width of 30.48 m (99 ft).

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Figure 1. Existing Transportation Network (Map 8, DARP)



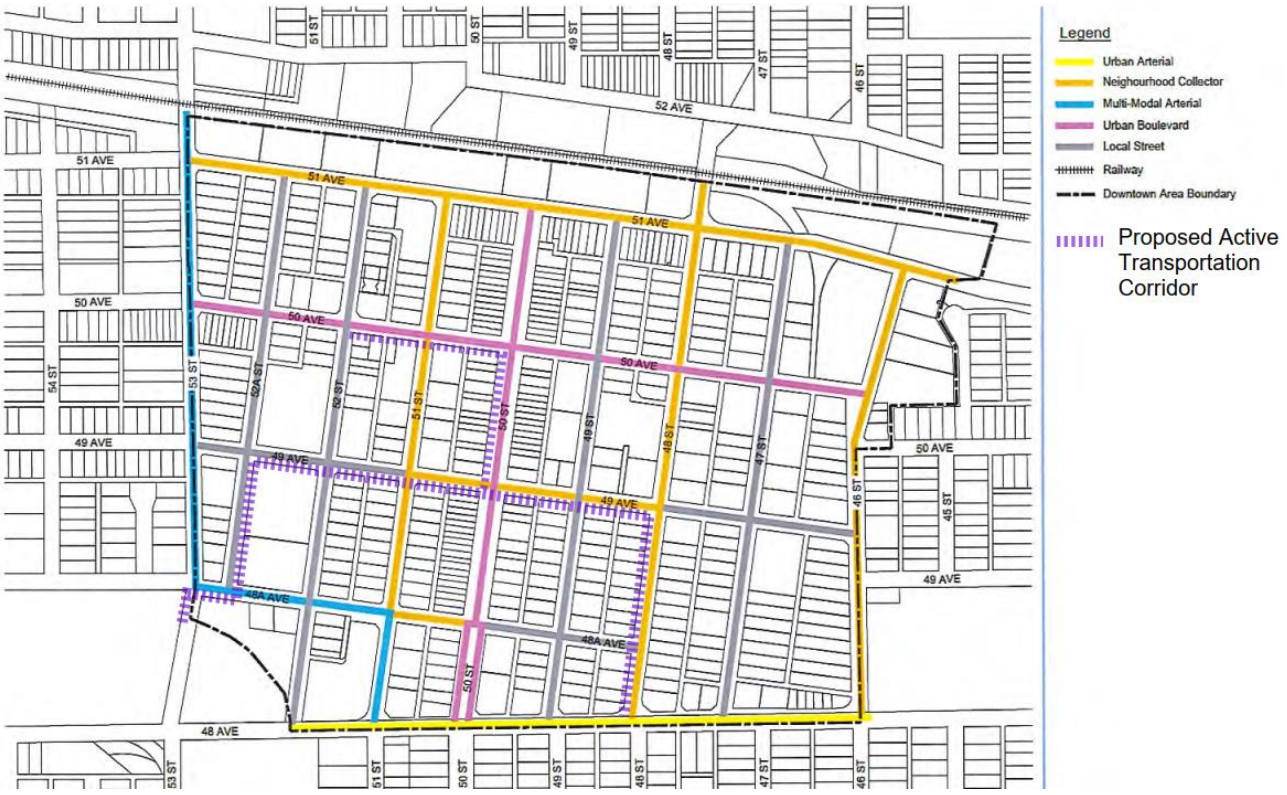
3 PROPOSED DARP CROSS SECTIONS

The DARP indicated five (5) roadway classification for local streets as part of the transportation network:

1. Urban Arterial
2. Neighbourhood Collector
3. Multi-Modal Arterial
4. Urban Boulevard
5. Local Street

In addition to the DARP, the Transportation Master Plan (WSP, November 2019) identified an active transportation network within the downtown. **Figure 2** shows the proposed transportation network as well as the route of the active transportation corridor.

Figure 2. Proposed Transportation Network (Map 11, DARP) with Proposed Active Transportation Corridor



The DARP provided preliminary cross sections of the proposed local streets that did not include dimensions. Therefore, based on a review of the DARP roadway cross section, City of Camrose Design Standards, and City of Edmonton Guidelines for an active corridor, Associated Engineering has updated the cross sections to include standard dimensions. Cross sections from the DARP have been modified to fit within existing road ROW widths with the understanding that additional land would not be acquired. **Figure 3 - Figure 6** show the proposed cross section street that include an active corridor and include:

1. Local Street Residential/Collector
2. Neighbourhood Collector
3. Urban Boulevard (A)
4. Urban Boulevard (B)

Figure 3. Local Street Residential/Collector (Figure 6, DARP)

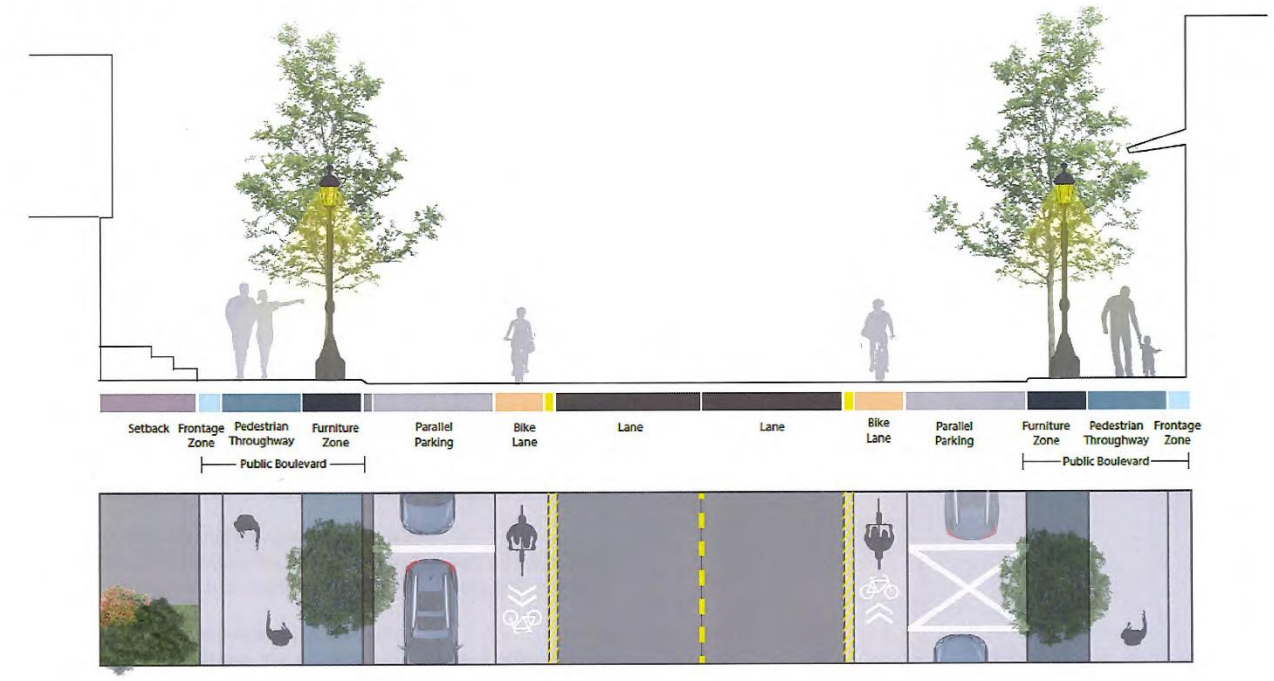


Figure 4. Neighbourhood Collector (Figure 7, DARP)

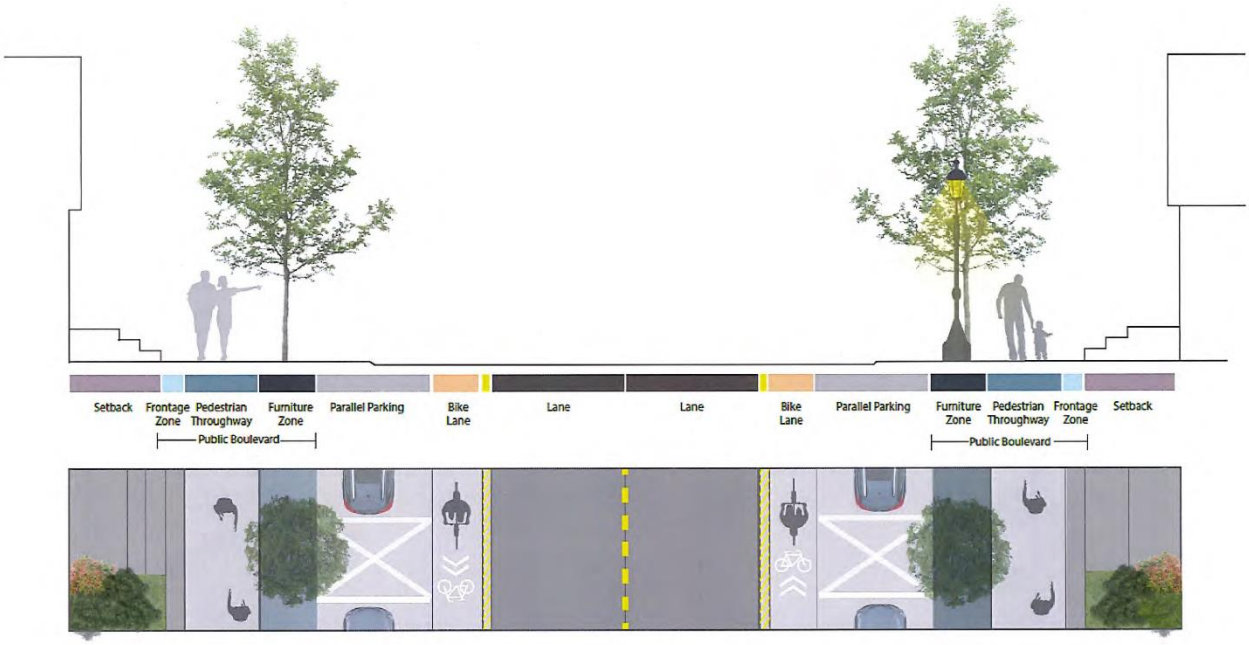


Figure 5. Urban Boulevard (A) (Figure 8, DARP)

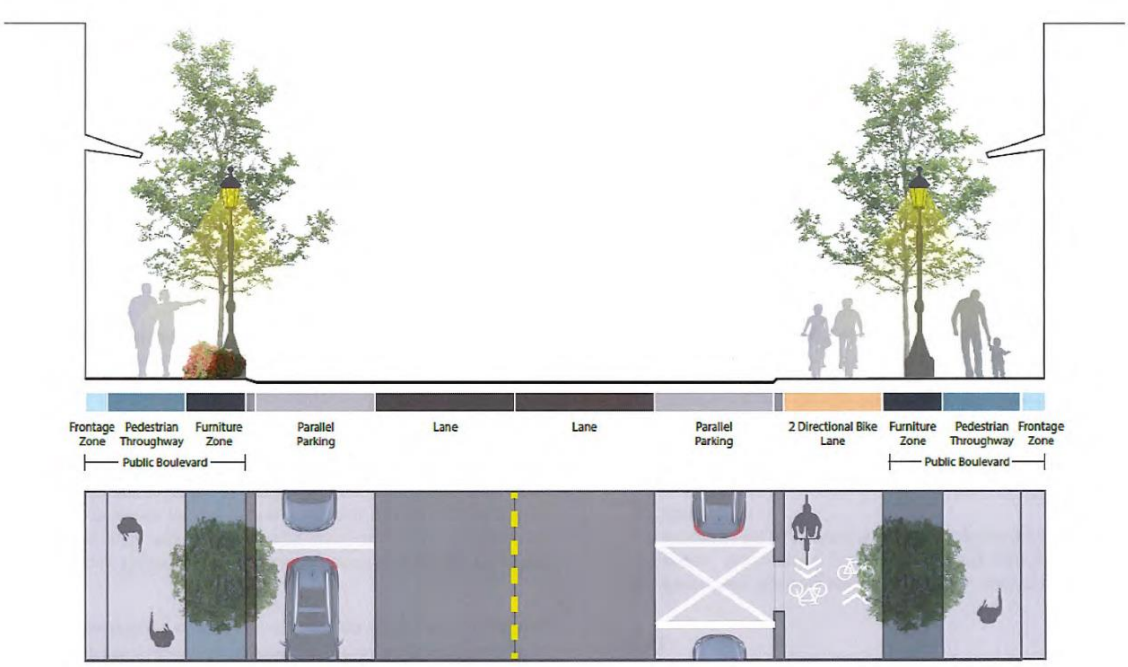
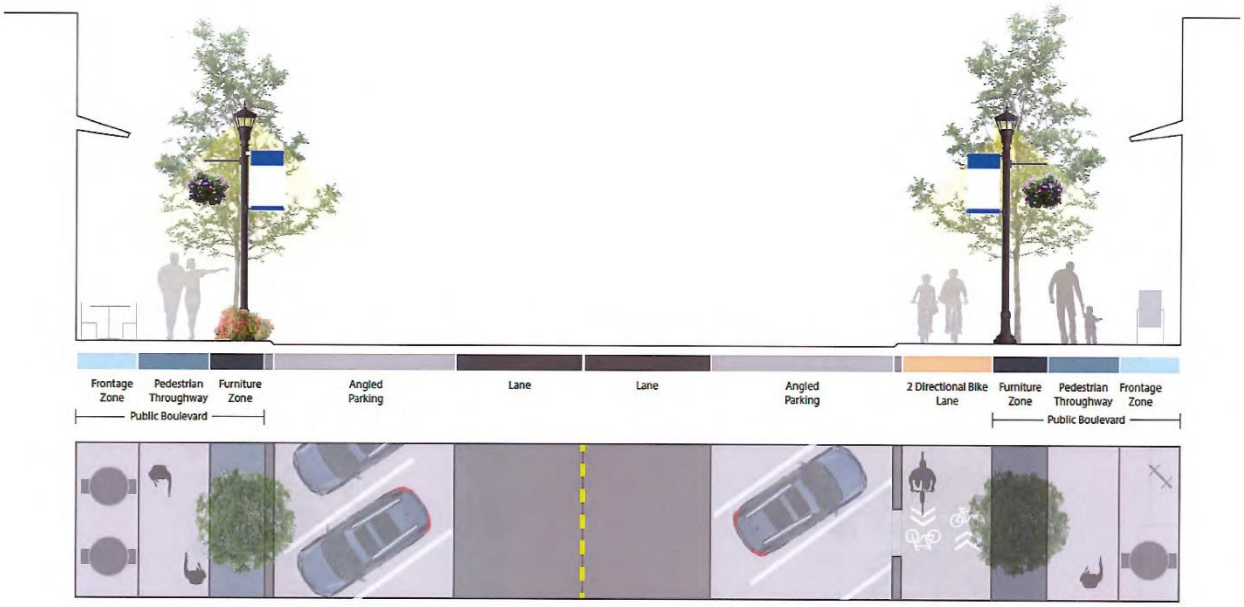


Figure 6. Urban Boulevard (B) (Figure 9, DARP)



Based on typical widths, the following tables demonstrate that the cross section included in the DARP do not fit within the Downtown existing ROW widths.

Local Street Residential/Collector (within a 20.12m ROW)

Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Bike Lane (m)	Bike Lane Setback (m)	Lane (m)	Lane (m)	Bike Lane Setback (m)	Bike Lane (m)	Parallel Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
0.3	1.5	2.0	2.45	1.8	0.6	3.3	3.3	0.6	1.8	2.45	2.0	1.5	0.3	**23.9**

Neighbourhood Collector (within a 20.12m ROW)

Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Bike Lane (m)	Bike Lane Setback (m)	Lane (m)	Lane (m)	Bike Lane Setback (m)	Bike Lane (m)	Parallel Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
0.3	1.5	2.0	2.45	1.8	0.6	3.3	3.3	0.6	1.8	2.45	2.0	1.5	0.3	**23.9**

Urban Boulevard (A) (within a 30.48m ROW)

Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Angle Parking (m)	Lane (m)	Lane (m)	Angle Parking (m)	Bike Lane Setback (m)	2 Direction Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
1.6	1.5	2.0	5.3	5.3	5.3	5.3	0.6	3.0	2.0	1.5	1.6	**35.0**

Urban Boulevard (B) (within a 20.12m ROW)

Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Lane (m)	Lane (m)	Parallel Parking (m)	Bike Lane Setback (m)	2 Direction Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
0.3	1.5	2.0	2.45	3.3	3.3	2.45	0.6	3.0	2.0	1.5	0.3	**22.7**

3.1 Local Street Residential/Collector (within a 20.12m ROW)

The proposed cross sections of Local Street Residential/Collectors are similar to Neighbour Collectors (Section 3.2). Therefore, the two are reviewed concurrently.

3.2 Neighbourhood Collector (within a 20.12m ROW)

Local Street Residential/Collector or Neighbourhood Collector are proposed for the majority of downtown roadways. The exceptions include 50th Avenue and 50th Street which are proposed to be Urban Boulevards (Section 3.3). The existing ROW widths for the proposed Local Street Residential/Collector or Neighbourhood Collector are 20.12m. The Active Transportation Corridor is proposed to be along both a Local Street Residential/Collector and Neighbourhood Collector. The below identifies potential cross sections scenarios within Local Street Residential/Collector and Neighbourhood Collector.

LSR/C-1 NC-1	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Lane (m)	Lane (m)	Parallel Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
	0.3	1.5	2.2	2.45	3.3	3.3	2.45	2.2	1.5	0.3	**19.5**

- **No Active Corridor**
- **Parallel parking on both sides of the roadway.**

LSR/C-2 NC-2	Frontage Zone	Pedestrian Throughway	Furniture Zone (m)	Bike Lane (m)	Bike Lane Setback (m)	Lane (m)	Lane (m)	Bike Lane Setback (m)	Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
	0.3	1.5	2.2	2.0	0.3	3.3	3.3	0.3	2.0	2.2	1.5	0.3	**19.2**

- **Active Corridor - Single Bike Lane on each side.**
- **Parallel parking is removed.**

LSR/C-3 NC-3	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Lane (m)	Lane (m)	Bike Lane Setback (m)	2 Direction Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL**
	0.3	1.5	2.0	2.45	3.3	3.3	0.3	3.0	2.0	1.5	0.3	**19.95**

- **Active Corridor - Two Direction Bike Lane on one side.**
- **Parallel parking is removed on one side.**

LSR/C-4 NC-4	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Bike Lane (m)	Lane (m)	Lane (m)	Bike Lane (m)	Parallel Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	**TOTAL** (m)
	0.3	1.5	2.2	2.45	3.3		3.3		2.45	2.2	1.5	0.3	**19.5**

- **Bike Lane is shared with vehicle lanes.**

3.3 Urban Boulevard (A) (within a 30.48m ROW)

The only street proposed to be an Urban Boulevard B with a 30.48m ROW is 50th Street (Main Street). Main street currently has angle parking on both the east and west side. One block of 50th Street, from 50th Avenue to 49th Avenue is proposed to be along the active transportation corridor. In order to maintain parking and facilitate an active transportation corridor, angle park on one side is proposed to revised to parallel parking.

UB (A)-1	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Angle Parking (m)	Lane (m)	Lane (m)	Angle Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	TOTAL (m)
	0.9	1.8	1.7	5.3	5.3	5.3	5.3	1.7	1.8	0.9	**30.0**

- **No Active Corridor**
- **Angle Parking on both sides**

UB (A)-2	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Angle Parking (m)	Lane (m)	Lane (m)	Parallel Parking (m)	Bike Lane Setback (m)	2 Direction Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	TOTAL (m)
	0.9	1.8	1.7	5.3	5.3	5.3	2.45	0.3	3.0	1.7	1.8	0.9	**30.45**

- **Active Corridor - Two Direction Bike Lane on one side.**
- **Angle Parking on one side. Parallel Parking on the other side.**

3.4 Urban Boulevard (B) (within a 20.12m ROW)

The only street proposed to be an Urban Boulevard B is 50th Avenue. 50th Avenue currently has parallel parking on both the east and west side. Two blocks of 50th Avenue, from 52nd Street to 50th Avenue is proposed to be along the active transportation corridor. In order to maintain parking and facilitate an active transportation corridor, parallel parking has been reduced to one side of the street.

UB (B)-1	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Lane (m)	Lane (m)	Parallel Parking (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	TOTAL (m)
	0.3	1.8	1.7	2.45	3.3	3.3	2.45	1.7	1.8	0.3	**19.1**

- **No Active Corridor**
- **Parallel Parking on both sides**

UB (B)-2	Frontage Zone (m)	Pedestrian Throughway (m)	Furniture Zone (m)	Parallel Parking (m)	Lane (m)	Lane (m)	Bike Lane Setback (m)	2 Direction Bike Lane (m)	Furniture Zone (m)	Pedestrian Throughway (m)	Frontage Zone (m)	TOTAL
	0.3	1.8	1.7	2.45	3.3	3.3	0.3	3.0	1.7	1.8	0.3	**19.95**

- **Active Corridor - Two Direction Bike Lane on one side.**
- **Parallel Parking on one side only.**

4 CONCLUSIONS AND RECOMMENDATIONS

We have reviewed the proposed cross sections developed and outlined in the DARP while considering upgrades identified in the various master planning documents. The cross sections outlined in the DARP did not assign widths and upon assigning standard dimensions to each of them it was evident that the established road right of ways would not accommodate the proposed cross sections. We have assessed each of the proposed cross sections and recommend the following revisions to the cross sections:

- Option LSR/C-1 and NC-1 be adopted for Local Street Residential/Collector and Neighbourhood Collectors that are not along the active transportation corridor.
- Option LSR/C-3 and NC-3 be adopted for Local Street Residential/Collector and Neighbourhood Collectors that are along the active transportation corridor. LSR/C-3 and NC-3 allow parallel parking to be maintained on a one side of the roadway and is consistent with a two-direction bike lane on one side recommended for the Urban Boulevards A and B.
- Option UB (A)-1 be adopted along 50th Street that is not within the active transportation corridor.
- Option UB (A)-2 be adopted along 50th Street that is within the active transportation corridor.
- Option UB (B)-1 be adopted along 50th Avenue that is not within the active transportation corridor.
- Option UB (B)-2 be adopted along 50th Avenue that is within the active transportation corridor.

Further modifications to the cross section will be required in preliminary and detailed design to consider existing landscaping, franchise utilities, and municipal infrastructure.

Figure 7 demonstrates the recommended cross sections that the City consider moving forward to Model Development.

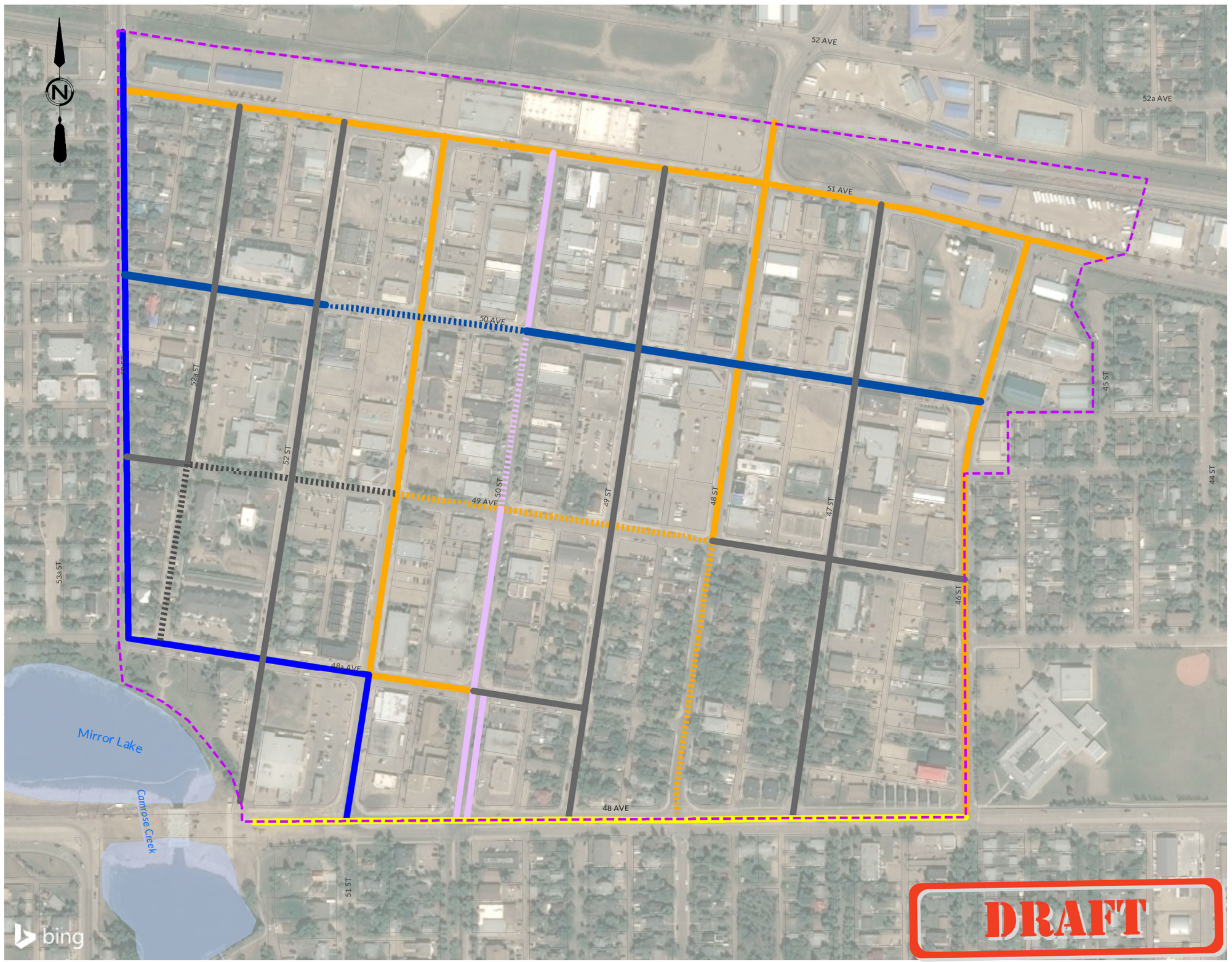
Prepared by: Carlie Pittman, P.Eng

Signature/Seal

[Initials]

IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Legend

- Project Boundary
- Water Body

Proposed Road

- LSR/C-1
- LSR/C-3
- RC-1
- RC-3
- UB(A)-1
- UB(A)-2
- UB(B)-1
- UB(B)-2
- Mutli-Modal Arterial
- Urban Arterial

Associated Engineering

CANADA BEST MANAGED COMPANIES Platinum member

CITY OF Camrose

FIGURE 7

CITY OF CAMROSE

PROPOSED DOWNTOWN ROADWAY CROSS SECTIONS

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	
DATE	2020JUL21
REV	
DESCRIPTION	ISSUED FOR DRAFT

SAVE DATE: 7/21/2020 2:28:48 PM SAVED BY:
DRAWING PATH: \\ae-edm-fs-01\working\2020-3737-00\gis\ArcMap\Fig7_ProposedRoads.mxd
DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS,

APPENDIX B - UNDERGROUND MODEL BACKGROUND DATA REVIEW DRAFT TECHNICAL MEMO

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

TECHNICAL MEMORANDUM

Issue Date:	February 22, 2021	**File No.:**	Design
To:	Jeremy Enarson, P.Eng., Manager Engineering Services	**Previous Issue Date:**	
From:	Carlie Pittman, P.Eng.	**Project No.:**	2020-3737-00
Client:	City of Camrose		
Project Name:	Downtown Infrastructure Renewal Plan		
Subject:	Underground Model Background Data Review		

DRAFT

1 INTRODUCTION & OBJECTIVE

The City of Camrose developed a plan to guide the redevelopment of the downtown area for the next 25 years. This plan, the Downtown Area Redevelopment Plan (DARP), was adopted by City Council in the spring of 2019. As a part of the DARP Study, the City performed a preliminary in-house review of the surface and underground infrastructure within the public rights-of-way.

Associated Engineering was engaged to complete the Downtown Infrastructure Renewal Plan Project in March of 2020. The scope of the project requires the development of a Renewal Plan for the municipal infrastructure in the Downtown Redevelopment Area. The surface component of the Renewal Plan includes a review of existing surface infrastructure and the development of a surface model that meets requirements outlined in the DARP. The underground component of the Renewal Plan includes a review of the various master planning documents and the development of an underground infrastructure model.

The DARP included a rehabilitation phasing plan which identified four rehabilitation phases shown in **Figure 1-1** understood to be the main driver for upgrades. If upgrades of a roadway or infrastructure are required outside of the planned rehabilitation phases, a review of all infrastructure upgrades in that location should be completed.

The objective of this technical memorandum is to identify information gaps and summarizes our review and technical assessment of the utility master plans including any recommendations made for underground infrastructure upgrades to be considered in development of the underground utility model for the Downtown Infrastructure Renewal Plan.

2 FRANCHISE UTILITIES COORDINATION

Franchise utilities within the Downtown Redevelopment Area include ATCO Gas, Telus, Fortis Alberta, and Eastlink who is the cable provider for the area. Associated Engineering reached out to each utility by email to present the project and understand their respective opinions and requirements. Associated requested information on the existing utilities, and any planned upgrades within the area. Information was also obtained from AltaLIS where available.

2.1 ATCO Gas

The existing utility information for ATCO Gas was collected by AltaLIS and is shown in **Figure 2-1**.

A Carbon Neutral Company

BEST MANAGED COMPANIES Platinum member

The majority of ATCO Gas utilities are within the alleys of the Downtown Redevelopment Area. ATCO Gas has no planned upgrades in the Downtown Redevelopment Area. However, ATCO has expressed that the aging ATCO facilities in the area would likely require updates if disturbances are to occur in the right-of-way.

ATCO advised that the current Franchise Agreement with the City states that as long as sufficient notice is given to ATCO with respect to construction disturbance around ATCO facilities, ATCO will relocate/update infrastructure at no cost to the city.

As redevelopment of the downtown occurs, the extent of the upgrades will need to be determined in coordination with ATCO.

2.2 Telus

The existing utility information for TELUS was collected by contacting TELUS directly and is shown in **Figure 2-2**. The majority of TELUS utilities are within the alleys of the Downtown Redevelopment Area.

Telus confirmed that they have no planned upgrades in the Downtown Redevelopment Area.

As redevelopment of the downtown occurs, upgrades may be required or desired to move above grade infrastructure below grade or relocate due to utility or surface works conflicts. Upgrades may therefore be dictated by the overall redevelopment and will need to be determined in coordination with Telus.

2.3 Fortis Alberta (Fortis)

The existing utility information for Fortis was collected by AltaLIS and is shown in **Figure 2-3**. AltaLIS provided the location of Fortis street lights, Fortis poles, and above ground Fortis cables. Information on service connections, and connections from underground cables to street lighting were not available.

The majority of Fortis utilities are within the alleys of the Downtown Redevelopment Area. Fortis confirmed that they have no planned upgrades in the Downtown Redevelopment Area. Fortis additionally advised that they only plan in five (5) year duration. Therefore, should any large-scale upgrades be planned during that five-to-ten-year timeframe, Fortis will contact the City.

As redevelopment of the downtown occurs, upgrades may be required or desired to move above grade infrastructure below grade or relocate due to utility or surface works conflicts. Upgrades may therefore be dictated by the overall redevelopment and will need to be determined in coordination with Fortis.

2.4 Eastlink

The existing utility information for Eastlink was collected by contacting Eastlink directly and is shown in **Figure 2-4**. Eastlink provided a sketch of utilities that included:

- Aerial Plant
- Coax Underground Plant
- Fibre Underground Plant
- Fibre and Coax Underground Plant

The majority of Eastlink utilities are within the alleys of the Downtown Redevelopment Area. Eastlink above ground cables share power poles with Fortis. Information on service connections was not available.

Eastlink confirmed that they have no planned upgrades in the Downtown Redevelopment Area.

As redevelopment of the downtown occurs, upgrades may be required or desired to move above grade infrastructure below grade or relocate due to utility or surface works conflicts. Upgrades may therefore be dictated by the overall redevelopment and will need to be determined in coordination with Eastlink.

3 WATER

3.1 Existing

The existing water distribution system is shown in **Figure 3-1**. The GIS data provided by the City upon commencement of the project did not include watermain elevation data. To fill in the data gaps, the valve key lengths included in the City of Camrose valve database were utilized to estimate depths. This new data is being incorporated into the GIS data.

3.2 Proposed

The 2006 Water Master Plan Update (Associated Engineering) proposed a number of upgrades within the Downtown Redevelopment Area, presented in **Table 3-1**.

Table 3-1 – 2006 Water Master Plan Proposed Upgrades – Downtown Redevelopment Area

Proposed Upgrade Year	Location	Description	Current Status
2011	51 Avenue (53-52 Street)	Install 200 mm*	City is planning to install in 2023
2011	51 Ave (47-46 St)	Upgrade 150 mm to 200 mm*	City is planning to upgrade in 2021 and continue waterline installation east of 46 Avenue toward the Public Works Facility
2026	51 St (48-48A Ave)	Upgrade 150 mm to 200 mm*	Not completed
2026	48A Ave (51-50 St)	Install 200 mm*	Not completed
2026	51 St (51-49 Ave)	Upgrade 150 mm to 200 mm*	Not completed
2026	49 St (50 – 48 Ave)	Upgrade 150 mm to 200 mm*	Not completed
2026	48A Ave (49-48 St)	Install 200 mm*	Not completed
2026	48 St (48A-48 Ave)	Install 200 mm*	Completed 2017 (Extended from 48-49 Ave)

*The Water Master Plan Update, as well as the current City of Camrose water distribution system design standards, identify the minimum size of water distribution main as 150 mm diameter for single family residential, 200 mm diameter for multi-family residential and 250 mm diameter for industrial / commercial. However, the Master Plan identified in Section 3.11 that the recommended **minimum watermain diameter within the Commercial Business District (CBD) Areas are to be 300 mm**. All of the Downtown Redevelopment Area is considered to be CBD area and should therefore be upgraded to 300 mm diameter.

Based on the recommended minimum diameter sizing for CBD areas, all the proposed upgrades from the 2006 Water Master Plan identified in **Table 3-1** are to be increased to 300 mm diameter, as shown in **Figure 3-2.**
The Master Plan Update also advised that since 1982, the City has been implementing a program to replace any remaining cast iron (CI) mains with PVC. Any CI replacements within the Downtown Redevelopment Area are to be upsized to 300 mm diameter as per the CBD sizing requirements.

The CI mains throughout the City of Camrose are replaced in coordination with future road surfacing programs. The current road surfacing program follows the recommendations outlined in the Pavement Condition Assessment Report,

completed by Tetra Tech in 2019. The report is based on a $2 million annual budget and covers a 20-year period. The roads within the Downtown Redevelopment Area identified for surface work are shown on **Figure 3-3**.

To date, there have been two areas where CI mains have been replaced and upgraded in locations not specifically identified in the Water Master Plan Update. These pipe upgrades fall under the general recommendation outlined in the 2006 Water Masterplan to replace smaller 150mm watermains to a more current size standard. These upgrades have been updated in the existing GIS Network, and are shown in **Table 3-2.**

Table 3-2 – Upgrades Completed Beyond 2006 Water Master Plan

Upgrade Year	Location	Description
2014	50 Ave (47-48 St)	Upgrade 150 mm CI to 250 mm PVC
2017	48 St (48-49 Ave)	Upgrade 150 mm CI to 300 mm PVC

4 SANITARY SEWER

4.1 Existing

The existing sanitary sewer collection network is shown in **Figure 4-1**. The GIS data provided by the City upon commencement of the project was not comprehensive. To fill in the data gaps, the City collected additional survey during the in 2020. This new survey data is being incorporated into the GIS data.

The majority of sanitary sewers within the downtown are 200 mm, with the exception of two trunk sewers of diameters ranging from 250 mm to 375 mm. Other than service connections, all pipes are greater than 200 mm.

4.2 Proposed

Associated reviewed the 2007 Sanitary Sewer Master Plan (Associated Engineering) which was modelled on a trunk sewer level. The Master plan did not identify any upgrades within the Downtown Redevelopment Area.

The current Engineering Standards for the City state that the minimum size for sanitary sewer mains shall be 200 mm diameter for residential and 250 mm for industrial/commercial areas. Based on the standards, the majority of the existing sanitary system in the Downtown Redevelopment Area are undersized. A more detailed assessment of the existing sanitary sewer system within the area is required to determine whether any upgrades to meet the 250 mm minimum sizing requirements are functionally necessary.

There have been two upgrades to the sanitary system within the Downtown Redevelopment Area since the release of the Master Plan Update. These include two locations where vitrified clay tile (VCT) pipe has been replaced with PVC. The upgrades are shown in **Table 4-1** below.

Table 4-1 – Completed Upgrades

Upgrade Year	Location	Description	Current Status
2014	50 Ave (47-48 St)	Upgrade 200 mm VCT to 200 mm PVC	Completed
2017	48 St (48-49 Ave)	Upgrade 200 mm VCT to 200 mm PVC	Completed

In 2016, the City retained ISL Engineering and Land Services to undertake a multi-year project to conduct CCTV pipe inspections on various sanitary and storm pipes within the City. The purpose of the study was to evaluate the current pipe conditions and to identify maintenance, replacement, or other actions that the City should take. The report identified a number of locations within the Downtown Redevelopment Area for repair and rehabilitation, and the priority level of the repairs. The majority of the recommended rehabilitation work is for trenchless sewer repair, with only a few locations recommending excavation for spot repairs. The locations identified for rehabilitation in accordance with the ISL Engineering and Land Services report, are shown in **Figure 4-2**.

5 STORM

5.1 Existing

The existing stormwater collection system is shown in **Figure 5-1**. The GIS data provided by the City upon commencement of the project was not comprehensive. To fill in the data gaps, the City completed additional surveys during the summer of 2020.

The Downtown Redevelopment Area has a complex network of sewers and manholes, some of which are parallel and interconnected, resulting from the history of development in the area. The model results show that the storm drainage system is functioning reasonably well but that some portions of the parallel system in the City center are not operating at their potential capacity.

The Stormwater Master Plan indicated that in June 2007 City staff reported that water “lapped at the door” of the Masonic Temple, on 48 Street between 50 Avenue and 51 Avenue. This area and two (2) others within the Downtown Redevelopment Area were identified as trapped low areas (not necessarily flooded):

- 48 Street (50 – 51 Avenue)
- 51 Avenue (53 – 52A Street)
- 51 Street (49 – 50 Avenue)

5.2 Proposed

The 2008 Stormwater Master Plan Update (Associated Engineering) proposed upgrades within the Downtown Redevelopment Area, as shown in **Figure 5-2** and listed below in **Table 5-1**.

Table 5-1 – Proposed 2008 Stormwater Master Plan Updates

Upgrade Year	Location	Description	Current Status
2008-2013	47 Avenue (53-52 Street)	110 m of 450 mm and 900 mm storm sewer	Completed
Not Identified	High-Value Commercial Areas	Increase Sewer Capacity*	Not Completed

* The Stormwater Master Plan Update indicated that "Should the City need to replace or resurface roads in the downtown in the future, consideration should be given to increasing the storm sewer capacity as is common for high-value commercial areas. A more detailed assessment of the storm sewer system should be carried out in the development of a downtown re-development plan, should such an initiative be anticipated. The City should explore opportunities for on-lot stormwater management in roof-top and parking lot areas, and potential Low Impact Development measures in any redevelopment of the downtown area, to attenuate the runoff from the lots in a major storm event."

A more detailed assessment of the existing stormwater system in the Downtown Redevelopment Area is required to determine the available options for alleviating risks of flooding in trapped low areas. This can be complete through conveyance or retention. This presents the opportunity to consider low impact development features (bio-retention), mass storage and re-use or simply surface storage and release through a conventional stormwater management facility with use of vacant lots.

6 CONCLUSIONS AND RECOMMENDATIONS

Following a review of the utility master plans, the utility and roadway condition assessment reports, and after feedback from the franchise utilities, Associated Engineering has prepared a summary of the existing and proposed utilities within the Downtown Redevelopment Area. These proposed utility upgrades will be incorporated into the DARPs four rehabilitation phases indicated in **Figure 1-1** as part of the Downtown Area Redevelopment Plan. If upgrades of a roadway or infrastructure are required outside of the planned rehabilitation phases, a review of all infrastructure upgrades in that location should be completed.

Franchise Utilities

There are no currently planned franchise utility upgrades that will influence the Downtown Infrastructure Renewal Plan. Advance notice of construction disturbances in the utility rights-of-way should be provided to the franchise utilities to allow for the coordination of any facility upgrades or relocations that result from the disturbance.

As redevelopment of the downtown occurs, upgrades may be required or desired to move above grade infrastructure below grade or relocate due to utility or surface works conflicts. Upgrades may therefore be dictated by the overall redevelopment and will need to be determined in coordination with each of the Franchise Utility companies.

Water

The 2006 Water Master Plan Update (Associated Engineering) provided a number of recommended upgrades within the downtown core. These upgrades include new installations, pipe up-sizing, and CI pipe replacements. In summary:

- All watermain upgrades within the Downtown Redevelopment Area are to be 300 mm PVC as per the City of Camrose Design Standards.
- Where possible, watermain upgrades are to be completed concurrently with road resurfacing work based on the 2019 Pavement Condition Assessment Report.
- Where the proposed timeline for the Master Plan recommended upgrades do not align with road resurfacing works, further consideration for upgrade phasing is required.

Sanitary

The 2007 Sanitary Master Plan Update (Associated Engineering) modelled the trunk sewers within the Downtown Redevelopment Area and did not identify any required upgrades with respect to capacity increase. The majority of the collection sewer mains are 200mm. Consideration for upsizing the sanitary sewer mains should be made to align with the future landuse and bring the size to the minimum standard for the zoning. i.e. minimum 250mm for commercial. Additionally, hydraulic modelling of the collection sewers could be completed to assess the overall network relating to the Downtown Redevelopment Area.

The 2016 ISL Engineering condition assessment report identified various locations within the Downtown Redevelopment Area where repair or rehabilitation were needed. The majority of the deficient areas can be addressed by the recommended Cast-in-Place Pipe (CIPP) with spot repairs are required. These upgrades will not impact the road surface above and can be completed as the severity of the deficiency dictates. For the few areas where excavation is required to conduct the repairs, further consideration for upgrade phasing is required. Should a section of roadway require the watermain and storm sewer to be upgraded, consideration should be given to upgrade the sanitary sewer with a replacement rather than lining.

Storm

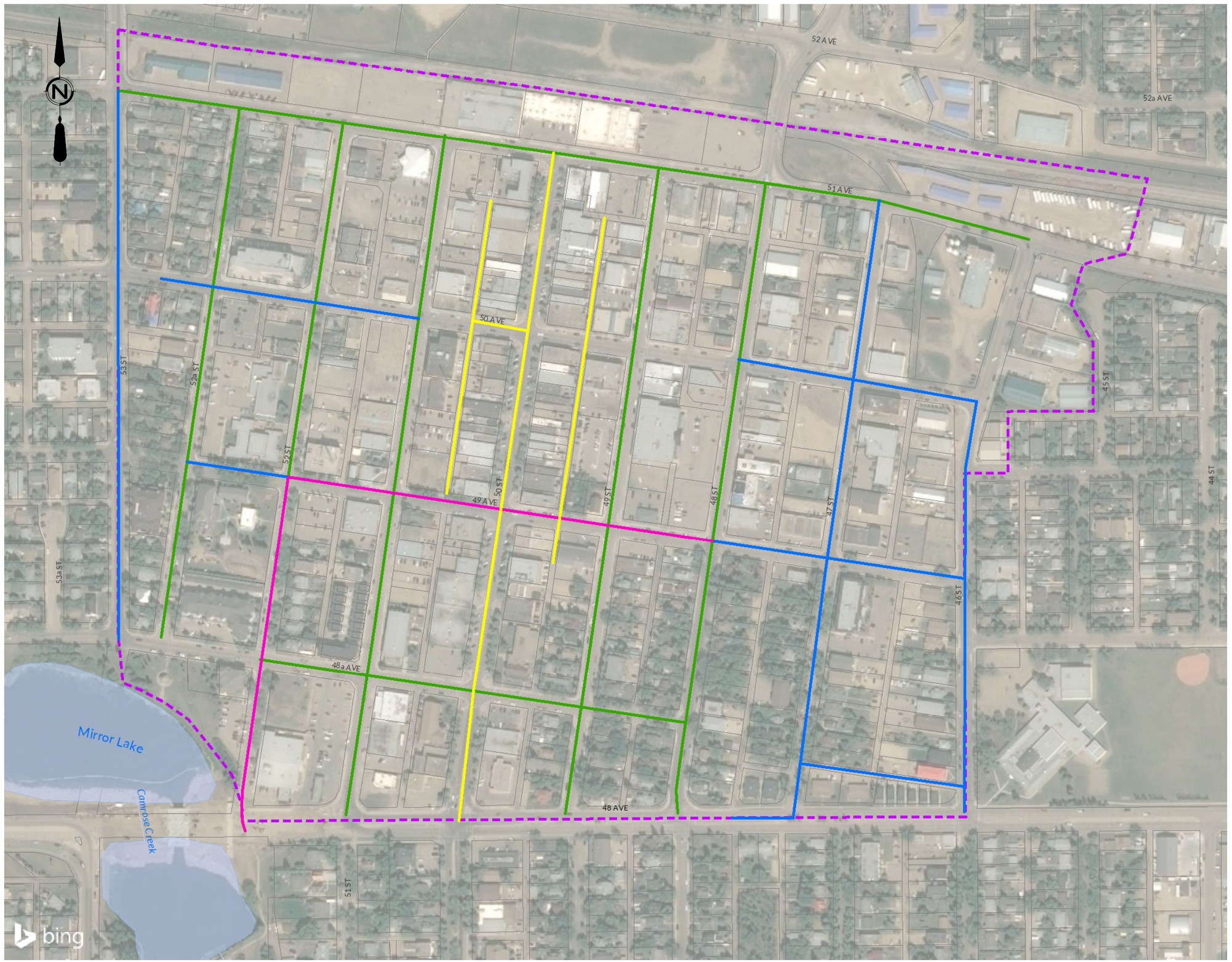
The 2008 Stormwater Master Plan recommends a detailed assessment of the existing stormwater system within the Downtown Redevelopment Area to determine the available options for alleviating risks of flooding in trapped low areas. With empty lots within the Downtown Redevelopment Area, this presents the opportunity to look at Low Impact Development features (bio-retention), mass storage and re-use or simply surface storage and release through a conventional stormwater management facility. Hydraulic modelling of the storm sewer should be completed to assess the overall network relating to the Downtown Redevelopment Area. Additional, and similar to the sanitary sewer, a condition assessment (CCTV) of existing stormwater system should be completed to consider CIPP rehabilitation.

Prepared by:

Carlie Pittman, P.Eng.
Project Manager

IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Legend

- Project Boundary
- Water Body

Rehabilitation Phasing

- 1
- 2
- 3
- 4

Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

CITY OF Camrose

FIGURE 1-1

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

REHABILITATION PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	
DATE	2020DEC07
REV	
DESCRIPTION	ISSUED FOR DRAFT

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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;

IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Legend

- ATCO Underground Lines
- Project Boundary
- Water Body

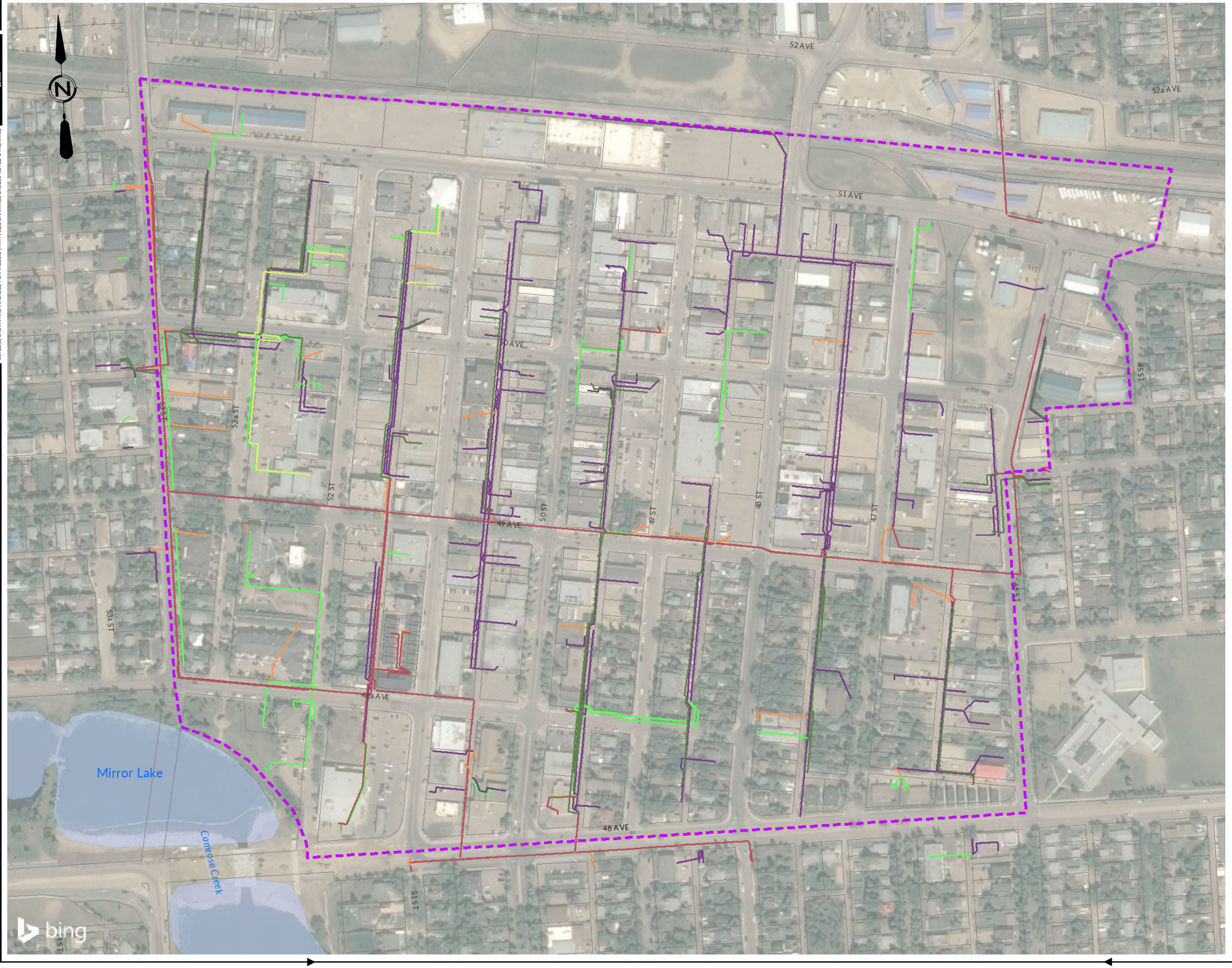
FIGURE 2-1

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING ATCO GAS

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APPROVED	
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REV	
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SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;

Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

Legend

- Cable Aerial
- Cable Buried
- Cable Underground
- Fiber Optic Aerial
- Fiber Optic Buried
- Fiber Optic Underground
- Project Boundary
- Water Body

DRAFT

CITY OF Camrose

FIGURE 2-2

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING TELUS

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	
DATE	2020DEC07
REV	
DESCRIPTION	ISSUED FOR DRAFT

IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

Legend

- FORTIS Street Lights
- FORTIS Poles
- FORTIS Lines
- Project Boundary
- Water Body

DRAFT

CITY OF Camrose

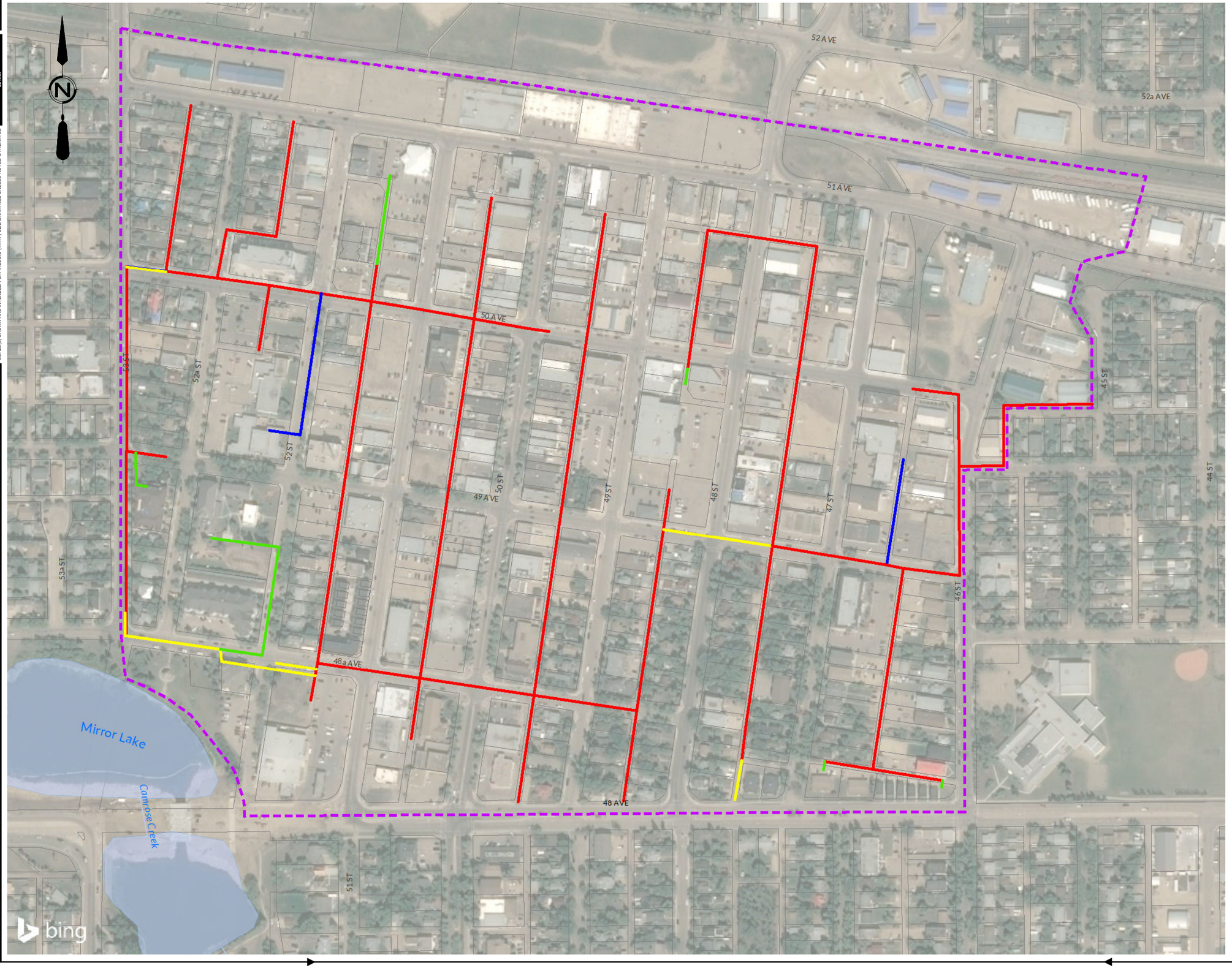
FIGURE 2-3

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING FORTIS ALBERTA

AE PROJECT No.	2020-3737
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APPROVED	
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REV	
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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS.



IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;

Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

Legend

- Aerial Plant
- Coax Underground Plant
- Fibre Underground Plant
- Fibre and Coax Underground Plant
- Project Boundary
- Water Body

DRAFT

CITY OF Camrose

FIGURE 2-4

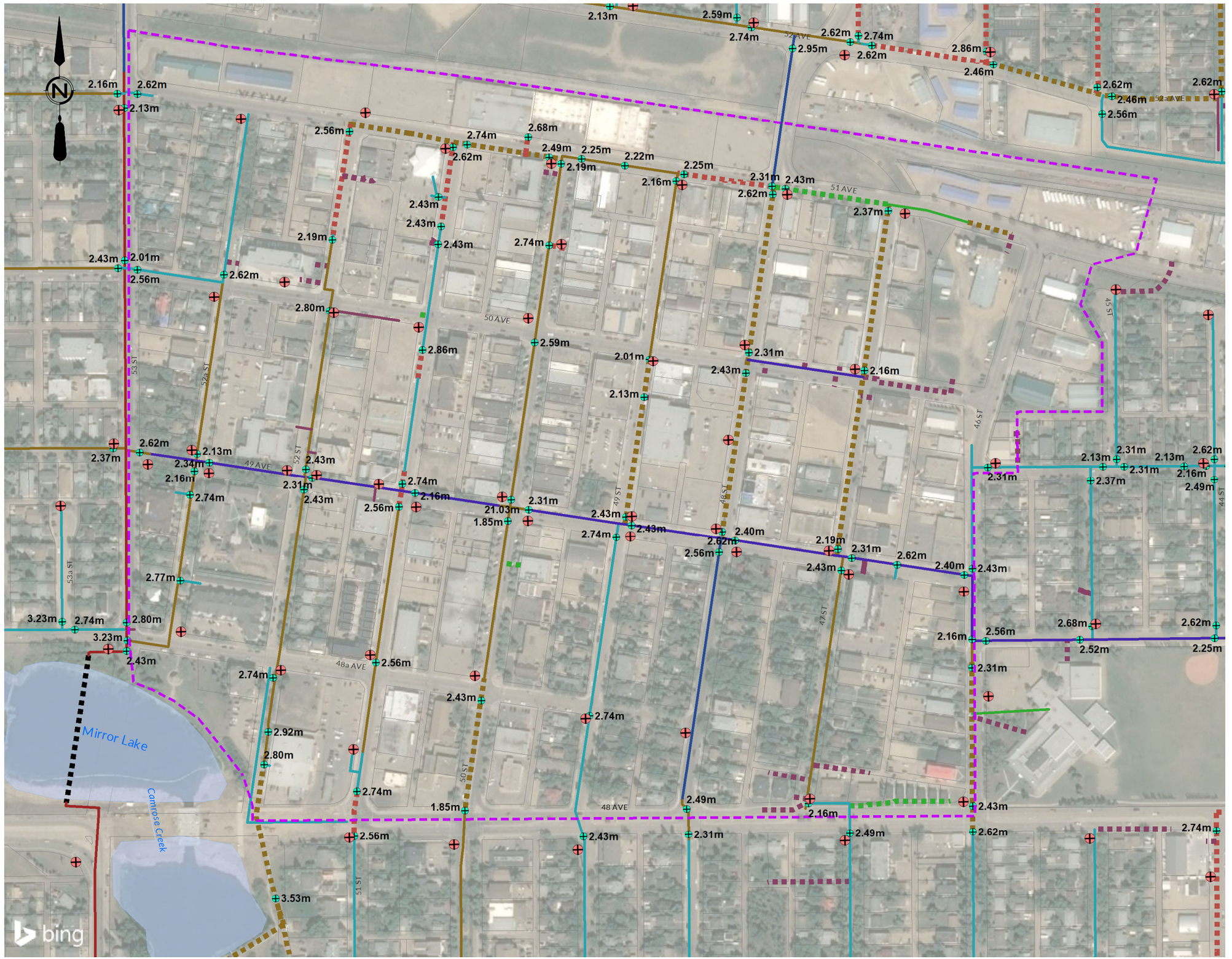
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING EASTLINK

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	
DATE	2020DEC07
REV	
DESCRIPTION	ISSUED FOR DRAFT

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Legend

- Hydrants
- Water Valves (Invert)
- Project Boundary
- Water Body

Water Line (diameter mm)

- <100
- 100
- 150
- 200
- 250
- 300
- 350
- PVC
- Non-PVC

DRAFT

CITY OF Camrose

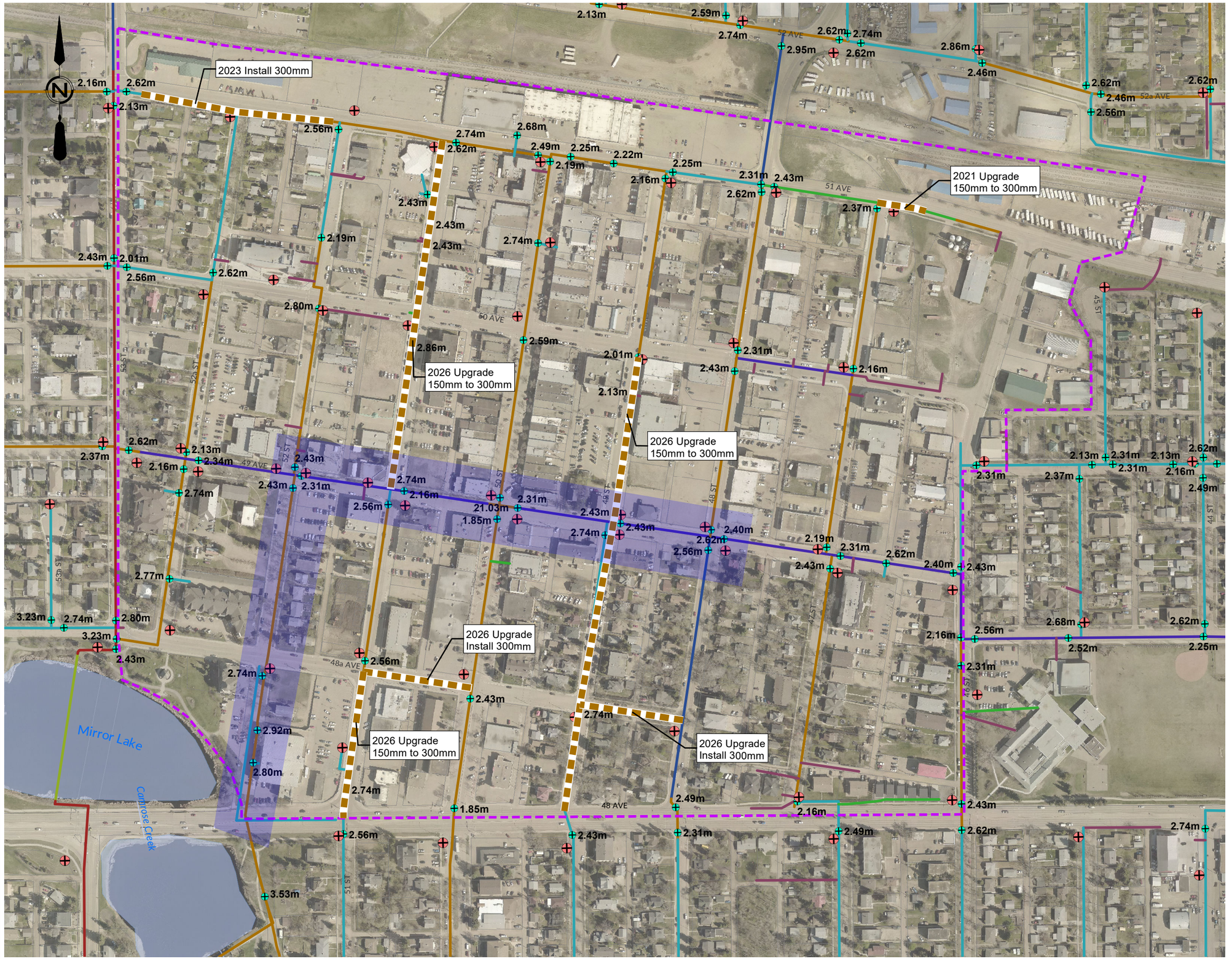
FIGURE 3-1

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING WATER

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APPROVED	
DATE	2020DEC09
REV	
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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;



IF NOT 25 mm ADJUST SCALES
28 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

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DATA SOURCE: :

Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

Legend

- Hydrants
- Water Valves (Invert)
- Project Boundary
- Water Body

Water Line (diameter mm)

- <100
- 100
- 150
- 200
- 250
- 300
- 350
- 450
- Proposed 300 WMP
  Replacement of CI (any size) to 300 PVC.
  Replacement of smaller PVC to 300 PVC.

DRAFT

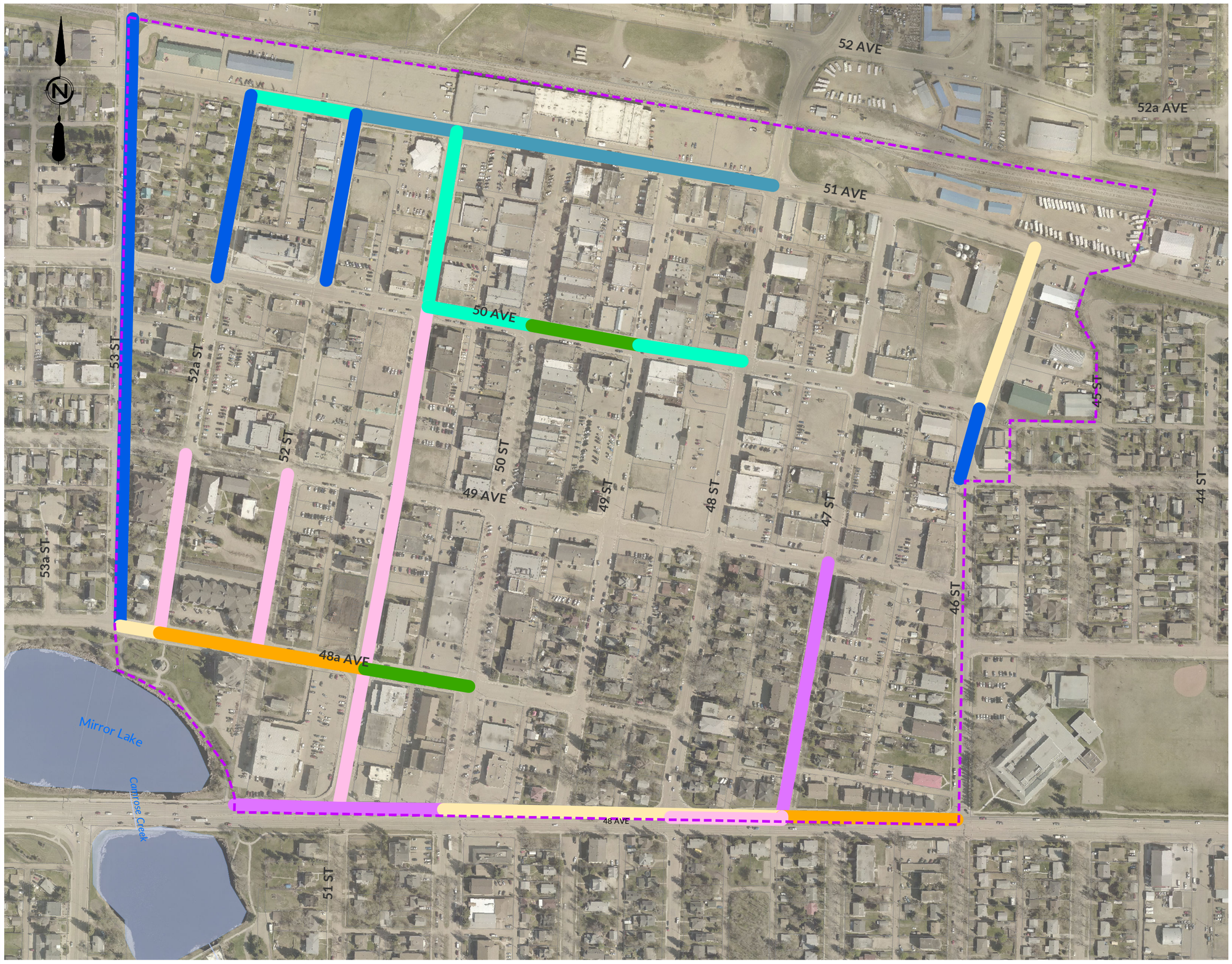
CITY OF Camrose

FIGURE 3-2

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

PROPOSED WATER

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	
DATE	2020DEC09
REV	
DESCRIPTION	ISSUED FOR DRAFT



Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

Legend

- Project Boundary
- Water Body

Proposed Surface Treatment Year

- 2019
- 2020
- 2021
- 2022
- 2024
- 2025-2030
- 2030-2035
- 2035-2040

DRAFT

CITY OF Camrose

FIGURE 3-3

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

PROPOSED SURFACE MULTI-YEAR PAVING PLAN

AE PROJECT No.	2020-3737
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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;

Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

Legend

- Sanitary Manholes
- Project Boundary
- Water Body

Sanitary Lines (diameter mm)

- Unknown
- 100
- 150
- 200
- 250
- 300
- 375
- 600

DRAFT

CITY OF Camrose

FIGURE 4-1

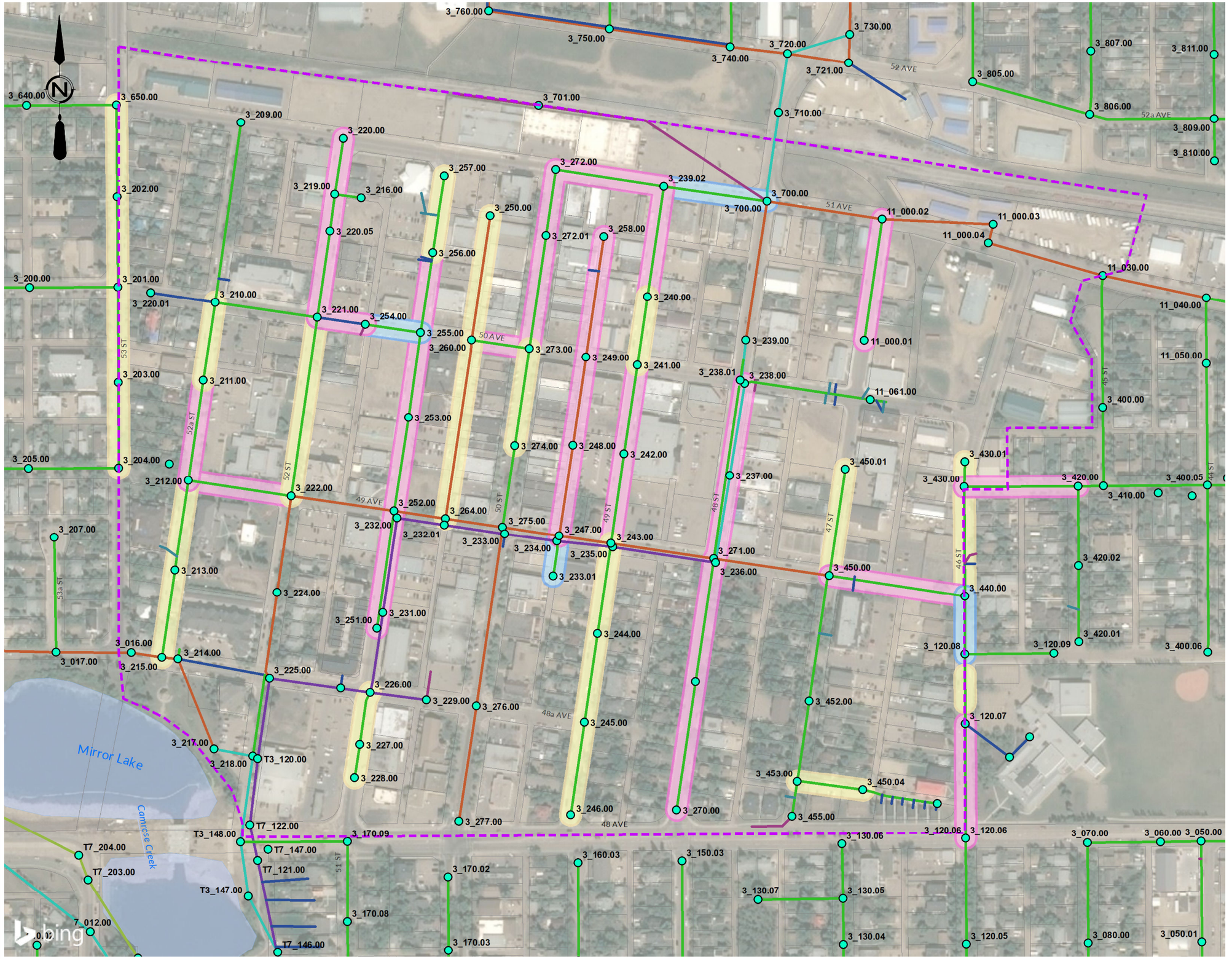
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXSITING SANITARY

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Associated Engineering

BEST MANAGED COMPANIES Platinum member

Legend

- Sanitary Manholes
- Project Boundary
- Water Body

Sanitary Lines (diameter mm)

- Unknown
- 100
- 150
- 200
- 250
- 300
- 375
- 600
- Repair Priority 1
- Repair Priority 2
- Repair Priority 3

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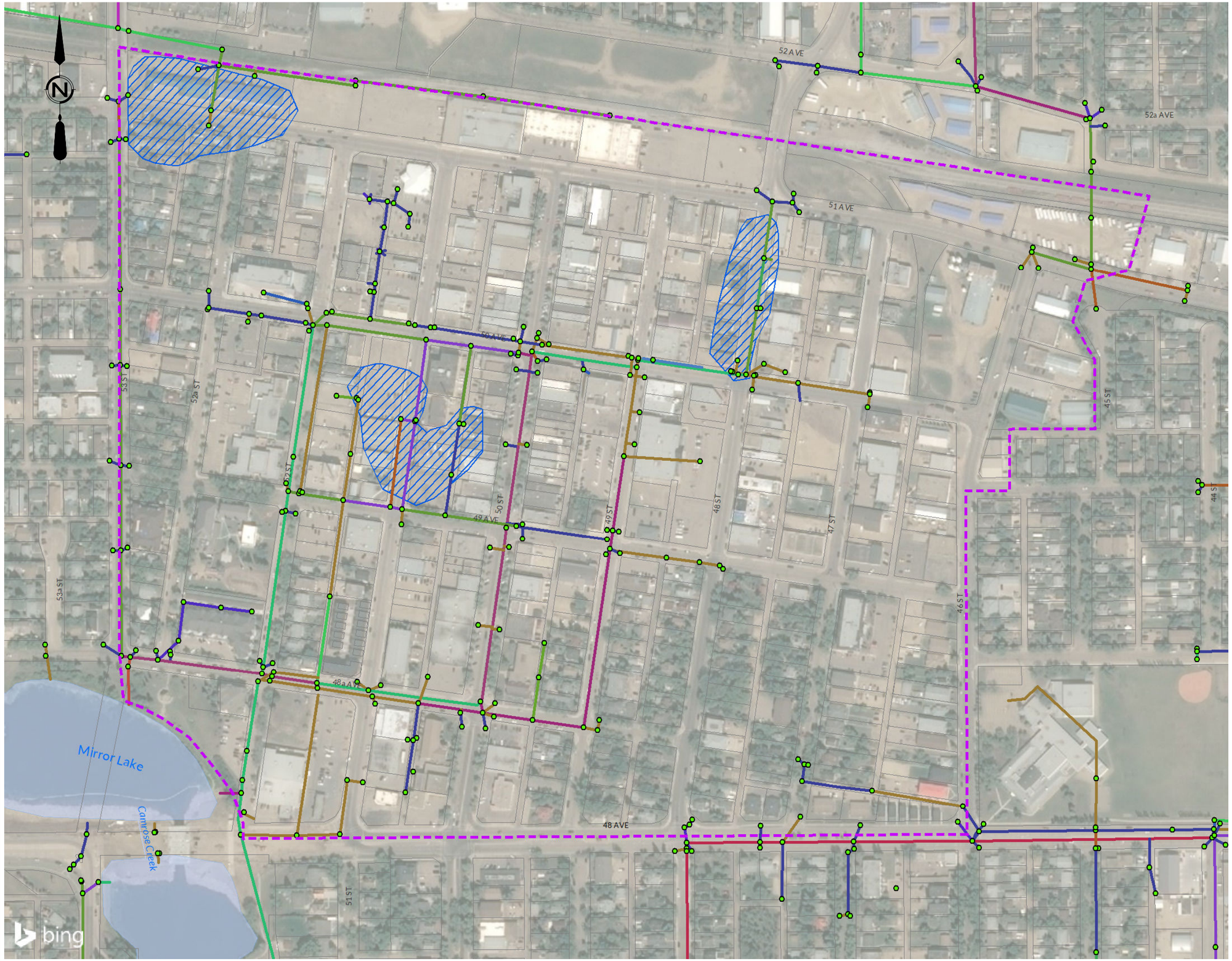
CITY OF Camrose

FIGURE 4-2

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

PROPOSED SANITARY

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SCALE	1:1,865
APPROVED	
DATE	2020DEC09
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DATA SOURCE: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS;

Associated Engineering

CANADA BEST MANAGED COMPANIES
Platinum member

Legend

- Storm Manholes
- Project Boundary
- Water Body
- Trapped Low

Storm Line (diameters mm)

- Unknown
- 100
- 150
- 200
- 250
- 300
- 375
- 400
- 450
- 525
- 600
- 675
- 750
- 850
- 900
- 1050
- 1500

DRAFT

CITY OF Camrose

FIGURE 5-1

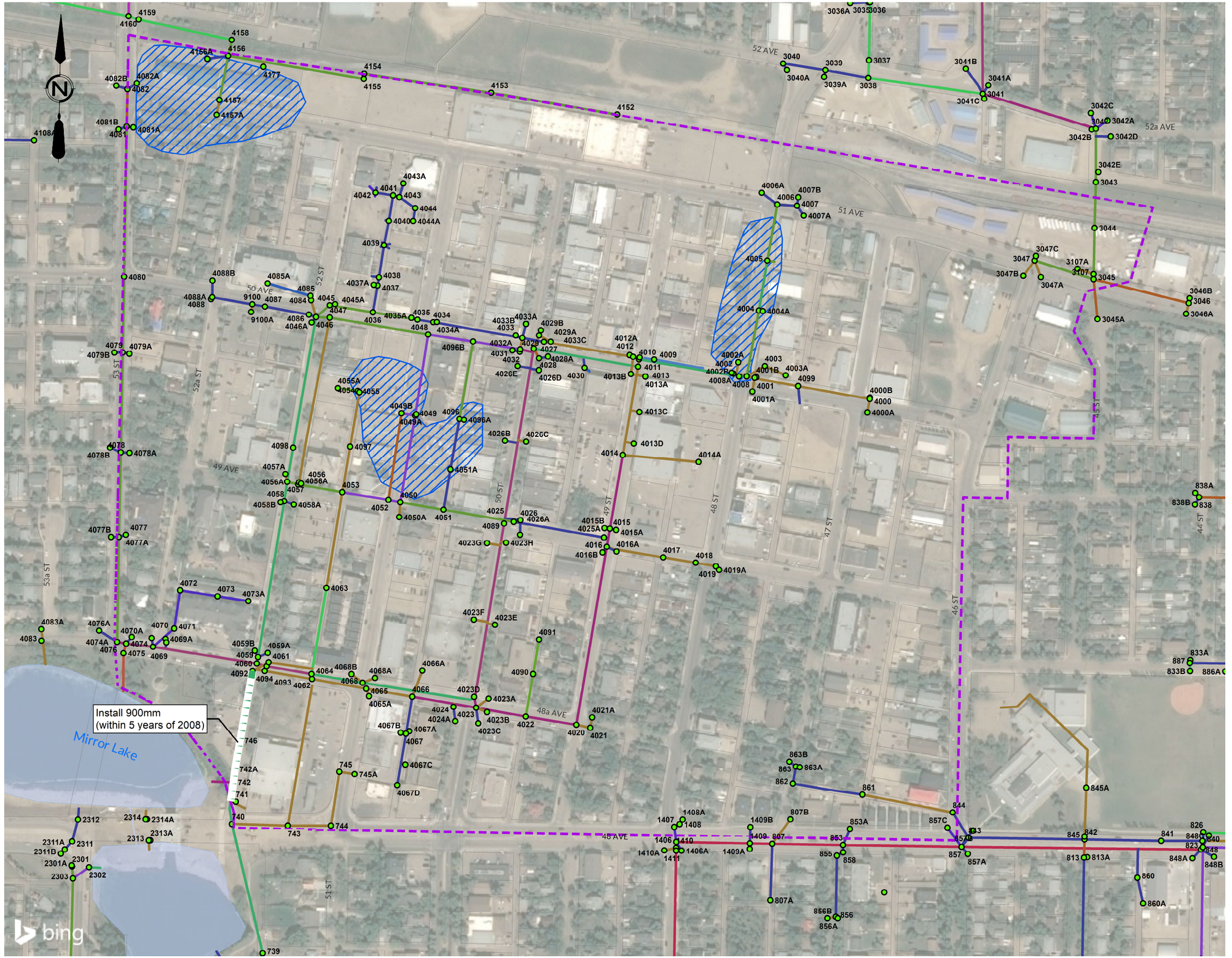
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

EXISTING STORM

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APPROVED	
DATE	2020DEC07
REV	
DESCRIPTION	ISSUED FOR DRAFT

IF NOT 25 mm ADJUST SCALES 25 mm

SCALE (S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Legend

- Storm Manholes
- Project Boundary
- Water Body
- Trapped Low

Storm Line (diameters mm)

- Unknown
- 100
- 150
- 200
- 250
- 300
- 375
- 400
- 450
- 525
- 600
- 675
- 750
- 850
- 900
- 1050
- 1500
- Proposed 900

Associated Engineering

CANADA BEST MANAGED COMPANIES Platinum member

CITY OF Camrose

FIGURE 5-2

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

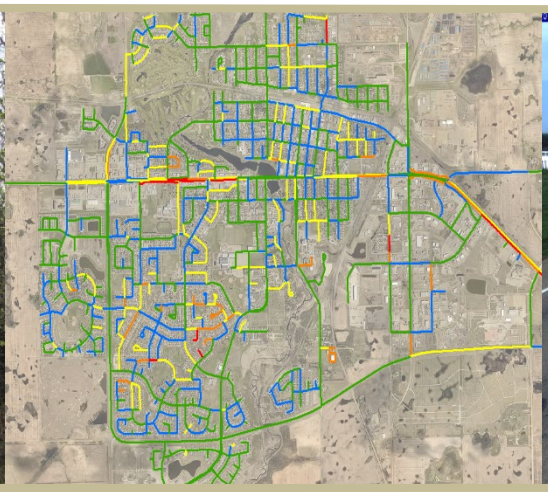
PROPOSED STORM

AE PROJECT No.	2020-3737
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DATE	2021JUL08
REV	
DESCRIPTION	ISSUED FOR DRAFT

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APPENDIX C - TETRA TECH PAVEMENT CONDITION ASSESSMENT REPORT - ROADWAY

Pavement Condition Assessment Report- Roadway


PRESENTED TO
City of Camrose

DECEMBER 18, 2019
ISSUED FOR USE
FILE: 704-TRN.PAVE03186-01

Tetra Tech Canada Inc.
Suite 1000 – 10th Floor, 885 Dunsmuir Street
Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

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APPENDIX SECTIONS

APPENDICES

Appendix A Tetra Tech's Limitations on the Use of this Document
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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of City of Camrose and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than City of Camrose, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix A or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the City of Camrose (City) to carry out a condition assessment of paved roads (except paved back alleyways) throughout the City, report the current condition status of paved roadways, and provide a multi-year rehabilitation plan with maintenance/rehabilitation/replacement.

This report documents the methodology followed to collect and analyze the pavement data, and reports the existing network pavement condition, and determines the funding required to maintain the paved road network at current service levels.

All data and results have been linked to an ESRI based project GIS and are herewith transmitted to the City via portable data storage device for upload to the City's GIS.

We are also provided an Asphalt Trails condition assessment report, under separate cover, as part of this assignment.

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.

Tetra Tech used a standardized methodology (PolylineM) for linear referencing of the pavement sections in a Geographic Information System (GIS). These special 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. Tetra Tech had developed the routes layer for the City in 2015. The route file was updated in 2019 by reviewing the roadway shapefile provided by the City in 2019 (Figure 1).

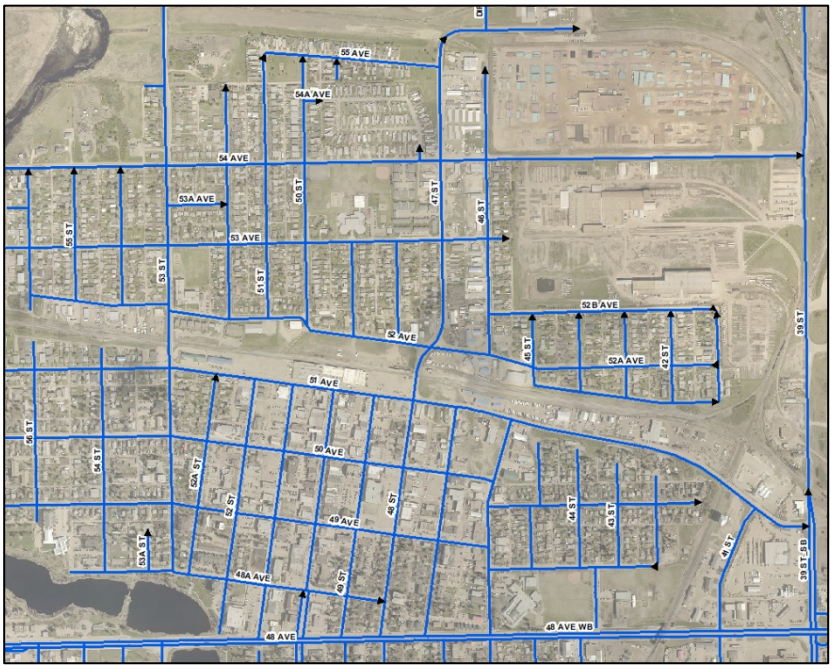


Figure 1: Example of Camrose Routes in GIS

Tetra Tech also developed a complete list of roads for data collection, a “Master List”, 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 City’s network ensuring to match the historical directionality where possible as well as to set up a unique raw “file name” necessary for processing of distress data. 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 along with any relevant field notes during the course of the data collection program (Figure 2).

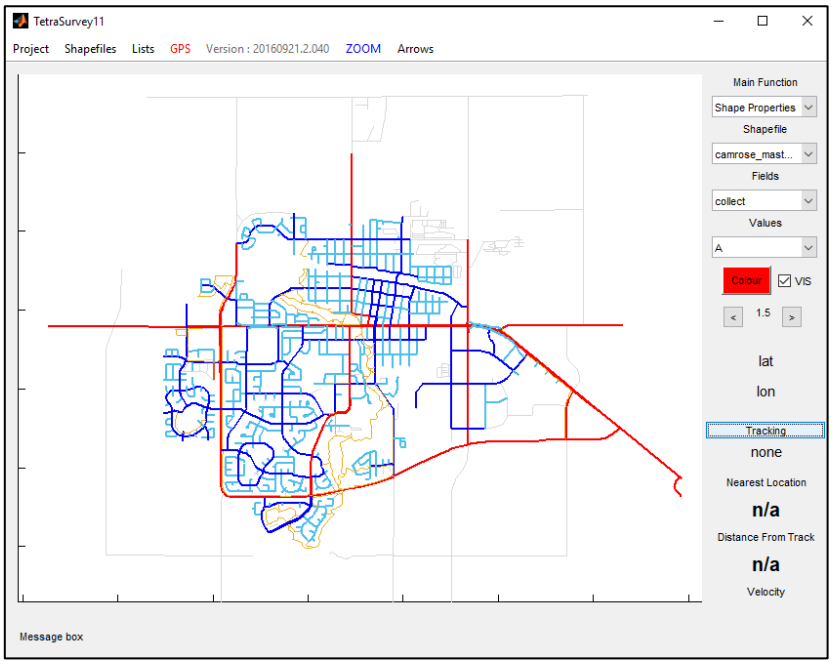


Figure 2: TT Surveyor Application used for Field Quality Control

3.0 PAVEMENT DATA COLLECTION

3.1 Pavement Surface Condition Evaluation

Georeferenced pavement condition assessments were conducted with the 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 in August 2019 on 153.8 lane-km of the City’s paved road network as shown in Table 1. All distressed runs were completed during daylight hours with dry pavement. A few segments were not collected mostly due to being gravel roads (1.5 km in total).

Table 1: Extent of Paved Road Data Collection

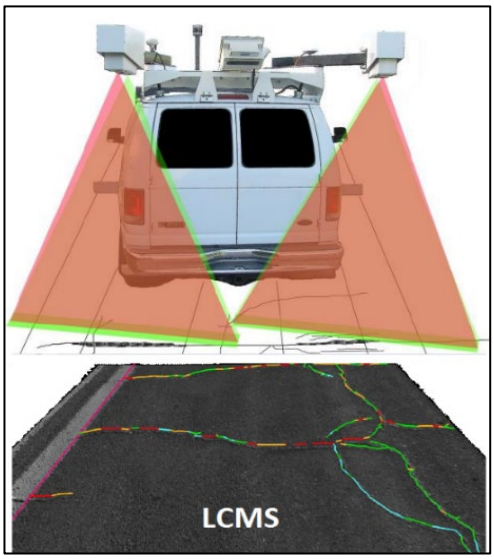
Road Class	Paved Roads	
	Centerline-km	Survey Lane-km
ART - Arterial	38.5	38.5
COL - Collector	45.7	45.7
LOC - Local	68.0	69.6*
Network	**152.1**	**153.8**
* There was one local segment (AUGUSTANA S) which was collected in two direction due to divided road		

3.1.1 Paved Road Distress Survey

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).

Tetra Tech collected network level distress data on all paved roads 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:



Representation of the LCMS

- Alligator Cracking
- Transverse Cracking
- Weathering
- Ravelling
- Longitudinal Cracking
- Rutting
- Potholes

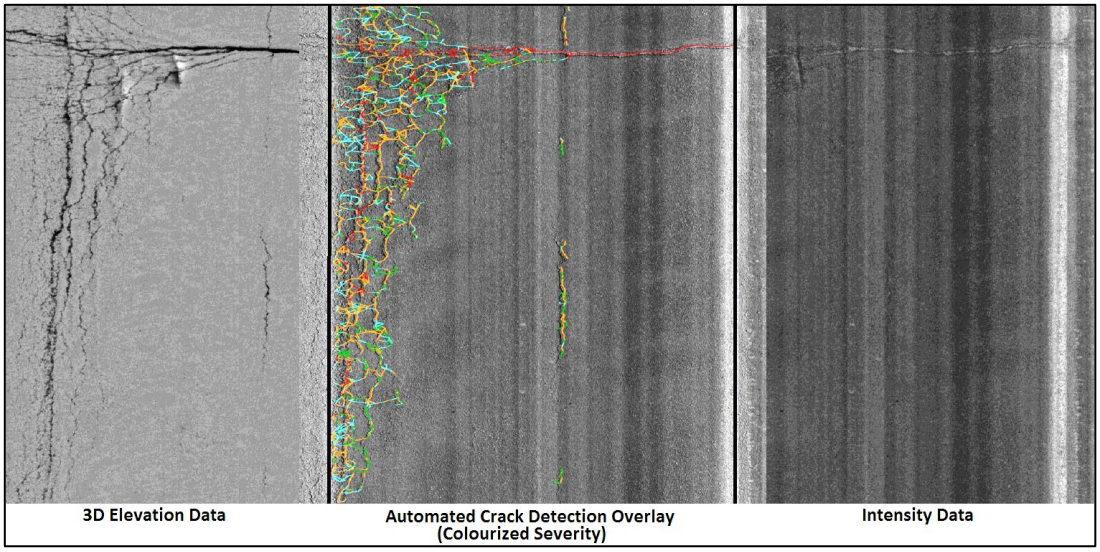


Figure 3: Automated Distress Detection using LCMS

3.1.2 Right-of-Way 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. Figure 4 shows an example of PSP-7000 digital image log.

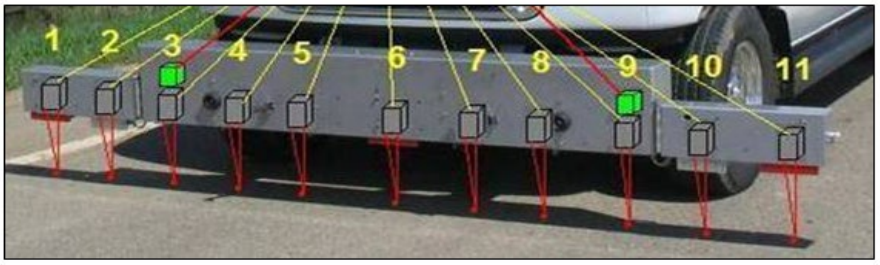


Figure 4: Example of PSP-7000 Digital Image Log

The direct linking of the ROW images into the project GIS is used by Tetra Tech 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.

3.1.3 Pavement Roughness Survey

The PSP-7000 vehicle's longitudinal profile and IRI 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. Tetra Tech collected the roughness data expressed in the International Roughness Index (IRI) using a high precision laser sensor array and two wheelpath 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"* (October 2001, which Tetra Tech assisted in developing). Exceptions to these guidelines specific to this work include a minimum start-up length reduction to 50 m in recognition of urban roadway environments.



Close-up view of PSP bumper showing laser/accelerometer (green) positions

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/hr for valid IRI measurements. The data was provided at a maximum interval of 50 m.

3.2 Incorporation of the City's Existing Data

The City's 2015 pavement condition data, timing of completed resurfacing projects in the past four years (2016 to 2019) and inventory data (road width and curb existence) were incorporated into an update of the City's existing PMS database. Inventory data was updated where missing or where new roads had been constructed since 2015.

Figure 5 shows the area of completed resurfacing projects since 2015. The figure indicates that the paving area fluctuates from 41,000 m^2 to 89,000 m^2 with average of 64,000 m^2 per year. Note that the pavement areas shown in Figure 5, were based on the tendered quantities in each year not necessarily the amount actually paved in that year. The City has advised, for example, that a portion of the 2018 pavement area was carried forward and completed in 2019.

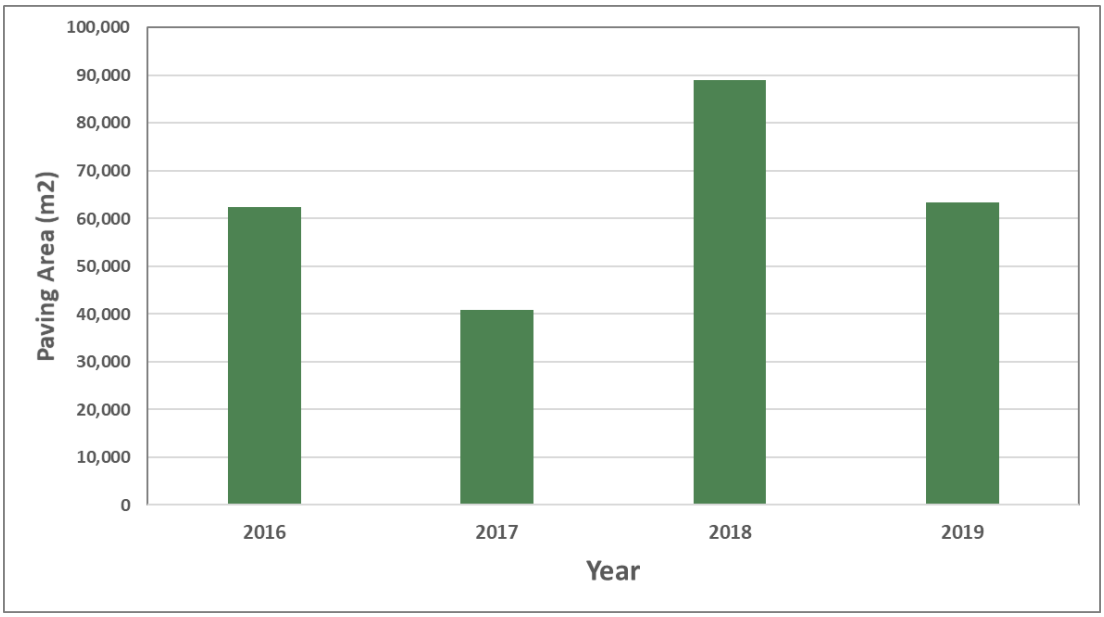


Figure 5: Completed Resurfacing Projects (2016-2019)

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. Selecting the appropriate pavement condition index depends upon the purpose that the index is intended to achieve. The following indices were used in this project:

- Pavement damaged surface area indices (such as Percent Cracking and Raveling) to select treatment.
- Pavement surface ruts (Rut); excessive rutting can pose a safety concern in wet weather on higher traffic speed roadways.
- Pavement Roughness (IRI) to identify riding comfort.
- Composite Indices (such as PCI and PAVI) for reporting.

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

Ravelling 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.

In 2015, Tetra Tech collected FWD strength data on a number of Arterial and Collector roads as selected by the City. A Modified Structural Number (SNP – inch or mm) can be calculated for each FWD test based on the pavement deflection and asphalt temperature. The SNP is used in conjunction with traffic data to determine additional asphalt thickness requirements. In addition, the SNP is a pavement structural input which is used in the cracking prediction models. The prediction models are further discussed in Section 6.1.

4.2 Pavement Rutting

The pavement surface ruts (RUT) 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.

4.3 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.

4.4 Composite Indices

Pavement Condition Index (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-D6433-11.

Although the PCI was intended to represent the overall condition of a pavement surface, Tetra Tech has found that it places too much emphasis on rut depth and does not directly consider roughness at all. Tetra Tech therefore developed a Pavement Asset Value Index (PAVI) that is directly related to the costs of restoring a pavement to as-new condition from its current state. The PAVI is expressed as a percentage of the pavement assets' remaining value.

A square meter of pavement is given a nominal value of 100 to represent the as-new value of:

- The excavation and subgrade preparation
- The sub-base supply, placement and compaction
- The granular base, supply, placement and compaction
- The cost of the in-place wearing surface

The cost to reconstruct the pavement varies by the thickness of the existing pavement but for simplicity is assumed to be \$75/m^2 for the Arterial pavements, \$65/m^2 for the Collector pavements and \$55/m^2 for the Local road pavements. These values, while not necessarily representative of the costs in Camrose, are typical in Western Canada. The cost of a mill and inlay is typically \$25/m^2, Patching costs \$10/m^2 etc.

The value of the pavement structure is reduced by cracks, raveling, weathering, ride quality and structural adequacy. Therefore, the repair cost is defined as follows for this project:

Repair Cost ($) =

Additional asphalt required for strengthening (where FWD results were available from 2015)

+ ACA *(50 mm Mill and fill Cost) + AFCW *(Reconstruction Cost)

+ WRH *(Micro surfacing Cost) + RVH *(Patching Cost)

+ {Segment Area* 50 mm Mill and fill Cost; IF (IRI> 3.5 mm/m or RUT>12)}

The PAVI is derived by following formula:

PAVI = 100 – Repair Cost /Asset Value

If an Arterial road has 100% of its surface area suffering from severe alligator cracking, it would require a full depth mill and replacement therefore $75 of its value is considered to be lost. It would have a PAVI of 100 – 75 = 25. Similarly distressed Collector and Local roads would have PAVI values of 35 and 45 respectively. If in addition ACP strengthening is required, the PAVI could fall to near zero for Arterial roadways. A PAVI of 100 represents an as-new pavement while a PAVI of 0 indicates a pavement structure with no remaining value; needing complete reconstruction including additional strengthening.

The PAVI has several important advantages over other overall pavement performance indices in that it represents the cost to restore the pavement to as new condition and can be used to directly assess the asset's nominal current value. If the pavement layer thicknesses are known (which they are not in Camrose), the actual asset value can be calculated. In either case the PAVI informs the pavement manager directly regarding how much restorative work is required. A PAVI of 75 indicates restorative work equivalent to a mill and inlay is required while a PAVI of greater than 75 might be considered for preservation and maintenance type treatments.

Moreover, by definition, local roads have a relatively higher PAVI than Arterials and Collectors so they are given less importance when using PAVI as a priority ranking tool. This is an improvement over the PCI which is independent of original construction value.

5.0 DATABASE OF PAVEMENT CURRENT CONDITIONS

The road condition indices of unit samples and roadside inventory data 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 2019 Paved Road Condition

As described in Section 4.0, damaged surface area indices, Rut, IRI, and composite indices 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 Table provides a breakdown of the average pavement condition based on Individual Indices such as pavement percent cracking, raveling, RUT and IRI in 2019 for each roadway classification.

Table 2: Average 2019 Pavement Condition based on Individual Indices

Road Class	Fatigue Crack (AFCA %)	Thermal Crack (TCA %)	Total Cracking (ACA %)	RUT (mm)	IRI (mm/m)
Arterial	5.5	5.8	11.3	5.5	2.4
Collector	4.2	10.2	14.4	3.0	3.7
Local	5.5	12.8	18.3	2.8	5.0
Network	**5.1**	**10.3**	**15.3**	**3.6**	**3.9**

Arterial roads had the lowest IRI (smoother), compared with the other road classifications in 2019. However, the average Rut of Arterial is higher than others, likely due to heavier traffic loading. Most of the analysis segments with moderate severity ruts where located on 48 Ave in both directions (Figure 6). As ruts can inhibit the ability to remove ice and snow, we considered high priority to fix moderate to high severity Rut for arterial roads in the analysis and treatment trigger .



Figure 6: Moderate Severity Rut-pavement segment located on 48 Ave WB (east side of 73 Street)

A breakdown of the average 2019 pavement condition, based on composite Indices for each roadway classification, is provided in Table .

Table 3: Average 2019 Pavement Condition based on Composite Indices

Road Class	PCI	PAVI
ART	65	86
COL	70	82
LOC	67	84
Network	**67**	**84**

Pavement condition represented by ACA, PCI, and IRI can be classified into five categories as good, satisfactory, fair, poor or very poor. Table 4 provides the range of values used for each condition description.

Table 4: Index Ranges for Condition Description

Rating	PCI[1] (%)	Cracking Index (ACA[3] %)	IRI (mm/m)[2]		Colour Code
			ART	COL/LOC	
Good	85-100	0-3	< 2.28	< 2.86	
Satisfactory	70 - 85	3 - 7	2.28– 3.59	2.86 – 4.49	
Fair	55 - 70	7- 15	3.59 -4.54	4.49 -5.69	
Poor	40 - 55	15 - 30	4.54 – 6.25	5.69 – 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 ART and 40 km/h for COL/LOC.
3. The ACA defined based on treatment requirements: Good - no maintenance required; Satisfactory - light maintenance only; Fair - heavy maintenance or light rehabilitation, Poor - heavy maintenance and rehabilitation and Very Poor – reconstruction.

The Rut distress greatly effects the ASTM calculation of PCI. At highway speeds, rutting could lead to dangerous hydroplaning. In low speed urban environments, rutting is not as dangerous but the ATSTM PCI standard does not take this into account. In addition, surveys along local roads are typically along the centre of the road, adjusting as required to avoid oncoming traffic and parked vehicles on either side and the rut measurement will be affected by pavement crown. For this reason, Tetra Tech remove Rut from the PCI calculation for local roads (but not Major roads). Because the Rut distress has such a significant effect on the PCI causes the average PCI of arterial roads be lower than local roads. Had the Rut distress, been omitted from the PCI calculations for arterial roads, the average PCI of arterial roads would have been 72 (versus 65) compared with the 67 for local roads.

The distribution of pavement cracking 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 City currently has 29% of its pavements in backlog (poor or very poor condition) with PCI< 55.

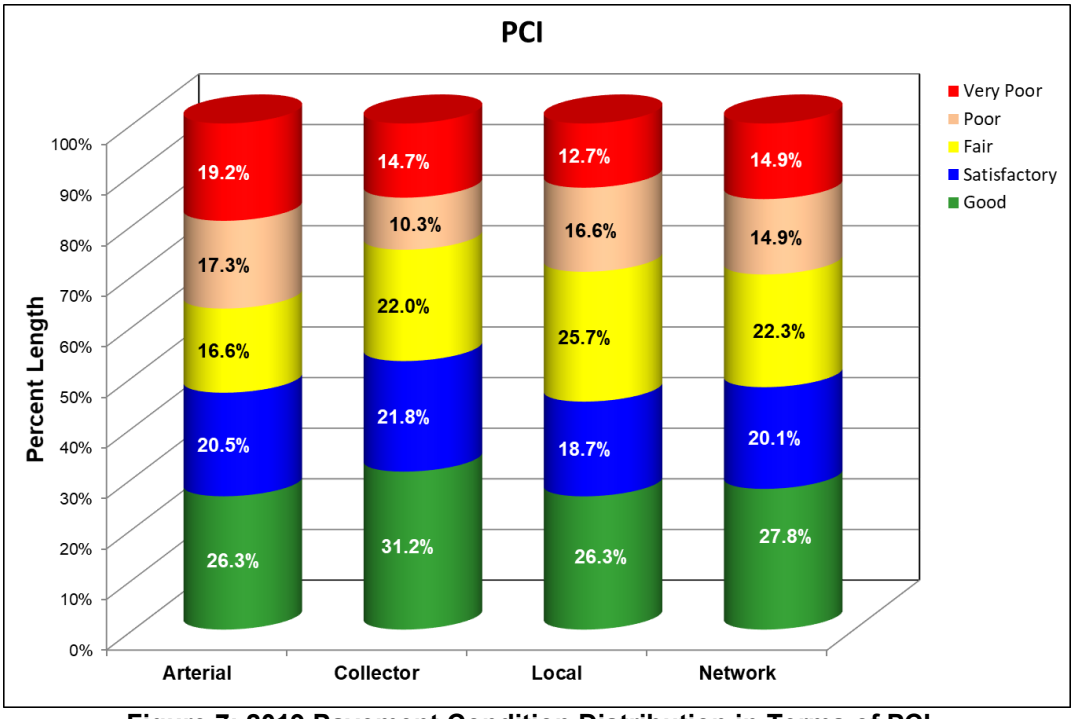


Figure 7: 2019 Pavement Condition Distribution in Terms of PCI

The distribution of ACA values for the network and for each roadway classification is shown in Figure 8. Based on crack index, local roads had worse condition compared with the other road classifications in 2019. About 52% of local roads had significant cracking (ACA>15%). Even though there is significantly less cracking on Arterial roads versus local roads, the PCI is higher due to the inclusion of the rutting distress on arterial roads as explained earlier.

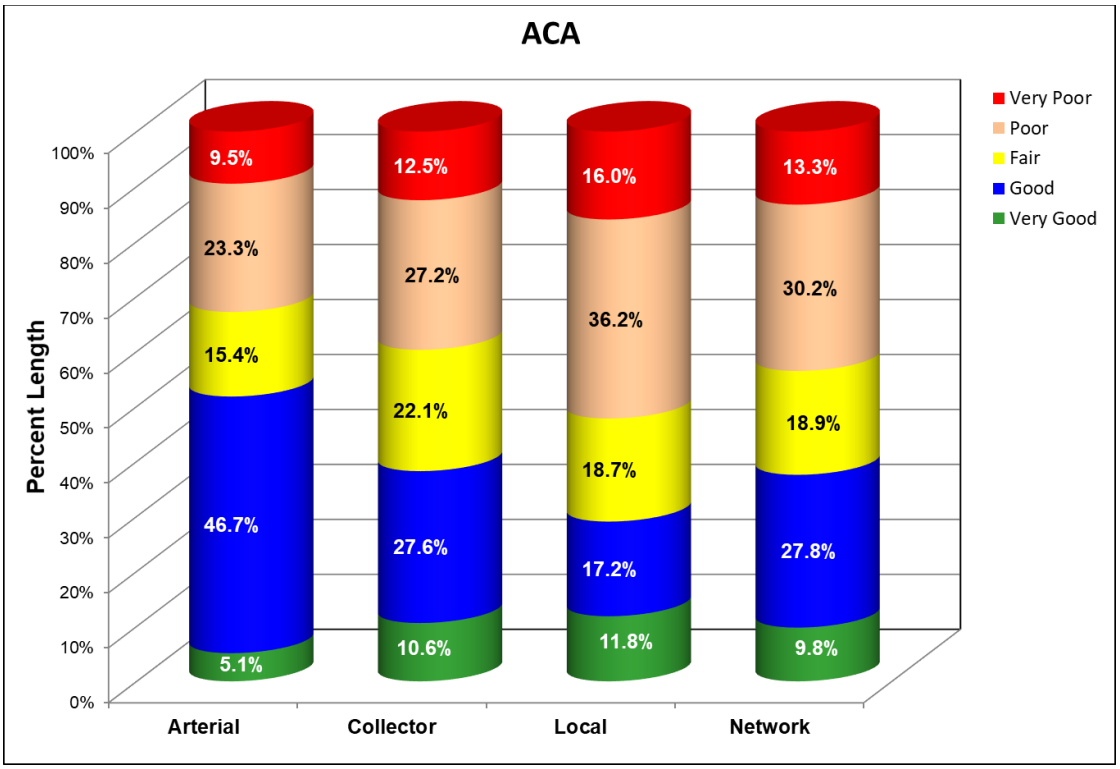


Figure 8: 2019 Pavement Condition Distribution in Terms of ACA

GIS maps displaying the 2019 PCI and ACA are presented in Appendix B.

Drivers' perception of roadway roughness varies depending on travel speed with smoother roads (lower IRI) desired for higher speeds. The IRI categories in Table 4 are based on normal travel speeds of 50 km/h for Arterial and 40 km/h for Collector /Local roads.

The distribution of IRI values for the network and for each roadway classification is shown on Figure 9. The figure indicates that 30% of the network overall, based on IRI, was in poor or very poor condition in 2019.

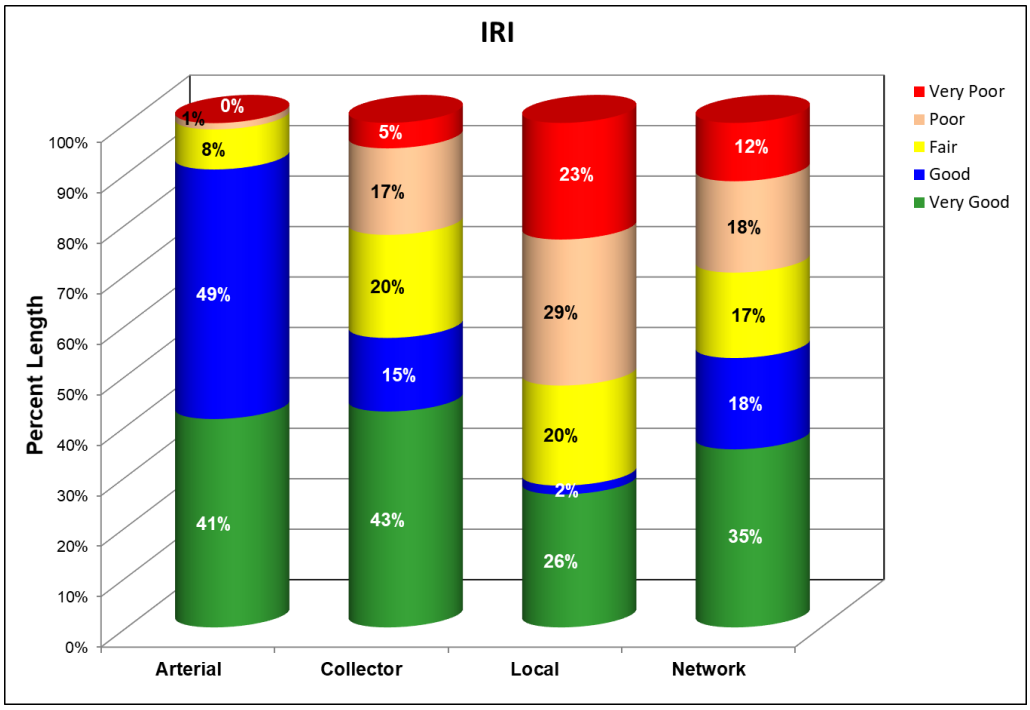


Figure 9: 2019 Pavement Condition Distribution in Terms of IRI

Detailed tabular data of 2019 pavement condition indices are provided in Appendix B.

5.2 Historical Pavement Condition Comparison

Table 5 shows a comparison between 2015 and 2019 pavement condition for arterial and collector roads (major roads) based on IRI, PCI and percent cracking (ACA).

Table 5: Historical Pavement Condition Comparison for Major Roads

Pavement Condition Index	Year	
	2015	2019
IRI (mm/m)	3.4	3.1
PCI	62	67
ACA (%)	17	13

As shown in Table 5, road roughness of major roads has improved from 3.6 mm/m to 3.1 mm/m on average. The IRI is a repeatable index for major roads, as survey speeds greater than 25 km/hr is required for valid IRI. Other indicators also imply a condition improvement since 2015, as PCI has increased from 62 to 67 and cracking has decreased from17% to 13%.

Figure 10 shows PCI condition distribution for local roads in 2015 and 2019. The figure indicates that the backlog of roads (poor and very poor condition) has increased significantly since 2015. Figure 11 shows an example of local road segment with PCI=55 (fair condition threshold) in 2015 has dropped to PCI=43 (poor condition) in 2019.

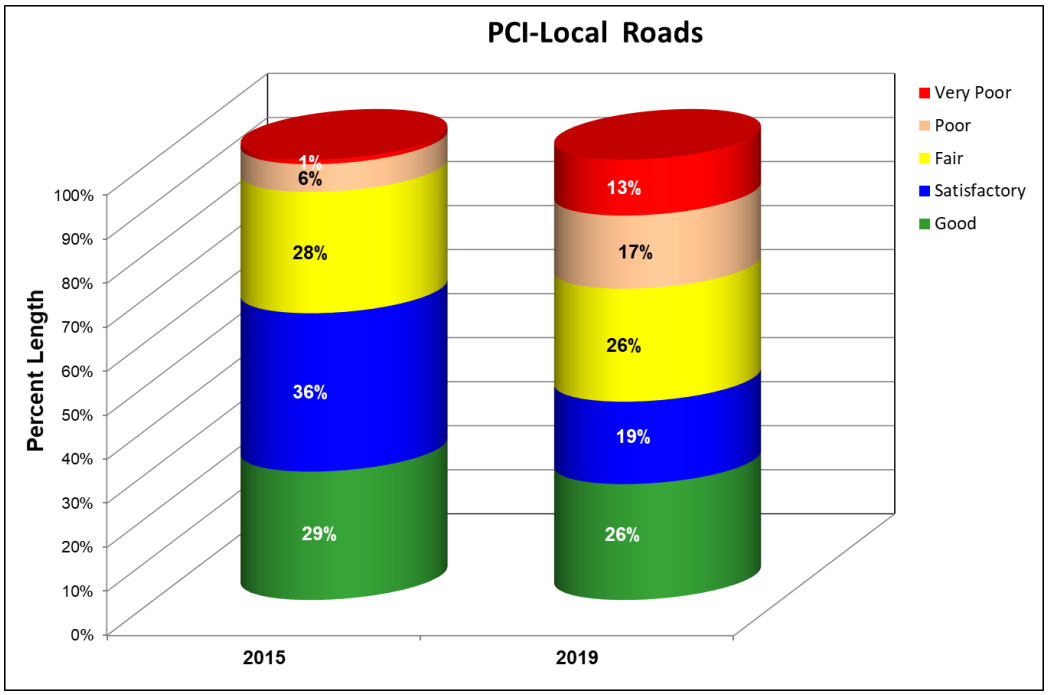


Figure 10: PCI Condition Distribution of Local roads in 2015 and 2019



Figure 11: Example of local road segment deteriorated Since 2015

In summary, the average PCI of the entire road network has not changed since 2015 (around PCI=68). The major roads have improved, as the City had major rehab works on arterial roads, whereas local roads has been deteriorating.

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 the past 20 years. These models can predict the propagation of individual distresses such as cracking, rutting, and roughness. Figure 12 illustrates the progression of these models from required inputs through to predicted condition (J. B. Odoki, 2003).

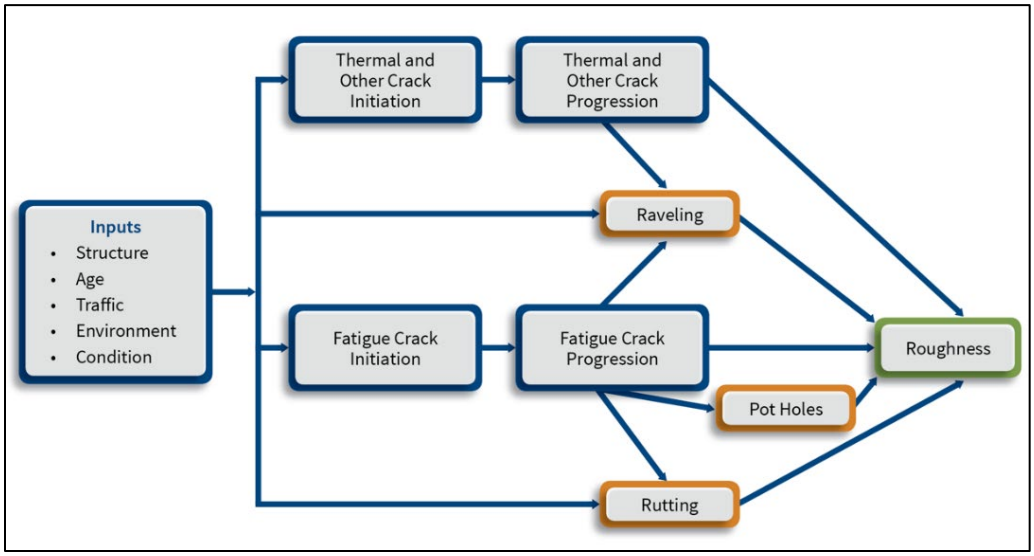


Figure 12: Predicting Pavement Performance

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

6.2 Rehabilitation and Maintenance Strategies

Tetra Tech used a number of maintenance and rehabilitation treatments which were established in 2015 study. The treatments and their unit costs are shown in Table 6. Typically, crack sealing and surface patching are considered maintenance treatments and the other treatments are considered rehabilitation treatments.

Table 6: Treatments and Unit Costs used in the Analysis

Treatment	Unit Cost	
Crack Sealing	$4.5/L-m	
Shallow Patch	$14/m²	
Deep Patch Repair	Local Road	$55/m²
	Collector	$65/m²
		$75/m²
Overlay 50 mm (OL50)	$22.5/m² +(Crack Area Patching Cost)	
Mill and Fill 50 mm (MF50)	$30/m² +(Crack Area Patching Cost)	
Full Depth Mill (FDM)	Local Road (Mill 50 , 75 mm inlay)	$55/m²
	Collector (Mill 100 , 100 mm inlay)	$65/m²
	Arterial (Mill 150 , 150 mm inlay)	$75/m²
Reclaim (RCLM)	Local Road (75mm Asphalt, 150 mm Granular)	$55/m²
	Collector (125mm Asphalt, 250 mm Granular)	$65/m²
	Arterial (200 mm Asphalt, 300 mm Granular)	$75/m²
Reconstruction (RCON)	Local Road (75mm Asphalt, 150 mm Granular)	$55/m²
	Collector (125mm Asphalt, 250 mm Granular)	$135/m²
	Arterial (200 mm Asphalt, 300 mm Granular)	$180/m²

* Crack Area Patching Cost = $40/m^2 * AFCL + $90/m^2 * AFCW;

** Crack Area Patching Cost = $90/m^2 * AFCW, where:

AFCL= Narrow fatigue crack (%); AFCW= Wide fatigue cracking (%).

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 sections 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” were developed so that only feasible strategies are explored. The triggers (shown in Table 7) limit the number of strategies to those that can feasibly be applied.

Table 7: Maintenance and Rehabilitation Triggers

Treatment	Curb Existence	Trigger Criteria	Variable
Crack Sealing	-	AFCL >1% Or TCL > 1%	AFCL: Narrow fatigue crack (%) AFCW: Wide fatigue cracking (%) AFCA: All fatigue cracking (%) TCL: Narrow thermal cracking (%) TCW: Wide thermal cracking (%) ACA: All Cracking Area (%) RVH: High Severity Raveling (%) RUT: Average Rut depth (mm)
Patching	-	AFCW + TCW > 1%	
Overlay (50 mm)	No	(AFCA >8% Or RVH> 10% OR ACA>25 or RUT> 10 mm for Arterial) And AFCA< 25% And ACA<45%	
Mill and Fill (50 mm)	Yes		
Full Depth Mill	-	(AFCA >25% And AFCA <40 %) OR (ACA >45% And ACA <60 %)	
Reclamation	No	AFCA>40% Or ACA>60%	
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, 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 individual 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 heavy 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). 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 13 illustrates three example strategies:

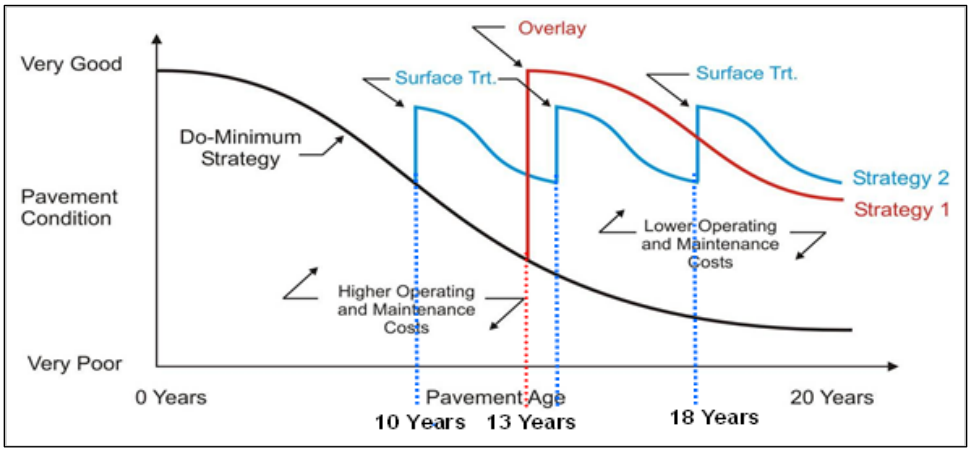


Figure 13: Life Cycle Cost Analysis Example

- The Do-Minimum strategy (base case strategy);
- Strategy 1 – Comprises a single overlay; and
- Strategy 2 – Comprises three thin surface 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 three 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, overlay, mill/inlay, full depth surface replacement, reconstruction and road reclamation 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:

LCC_{pv}	Present Value of all Life Cycle Costs
CC	Initial construction costs of the pavement structure
$(R+M)C_{pv}$	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.

6.3.1 Method to Measure Benefit

One method to derive the benefit is to multiply the area under the pavement performance curve and the length of the pavement section. 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 14 shows an example of calculating the benefit for a strategy with one overlay, early in the 20-year analysis period.

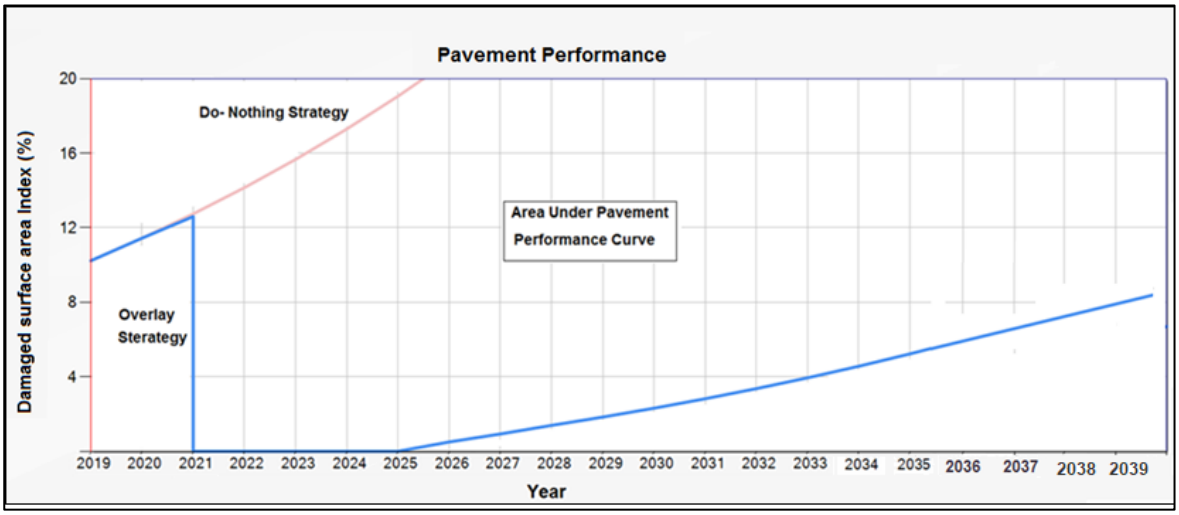


Figure 14: Example of calculating the benefit for an Overlay Strategy

Up to this step, all things being equal, a local road with the same amount of distress 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 was also considered based on road classification, as described in Table 8.

In summary, the benefit was defined combining both condition and traffic, as shown in the following formula:

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

Table 8: User Priority Factor for each Roadway Classification

Road Class	User Priority Factor
Arterial	6
Collector	3
Local	1

6.4 Budget Scenarios for Paved Road Network

It is understood that the City intends to have an annual capital budget of $2,000,000 to rehabilitate the asphalt on paved roads. This budget does not include concrete curb and gutter, monolithic sidewalk, or landscaping which is often completed at the same time as paving.

In order to assist the City with its decision-making process, four funding levels were used as alternative budget constraints over next 20 years for the road network. The budget levels used are given in Table 9.

Table 9: Budget Scenarios used in the 2019 Analysis

Budget Scenario	Average Annual Capital Budget
1 (current funding)	$2,000,000
2	$2,100,000
3	$2,300,000
4	$2,500,000
5	Unconstrained Budget

7.0 ANALYSIS RESULTS

7.1 Needs Assessment (Unconstrained Budget Analysis)

An unconstrained budget is sometimes called a needs-based budget which 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. An unconstrained budget scenario was analyzed to identify the rehabilitation needs and earliest intervention timing over the next 20 years. Figure 15 summarizes the rehabilitation costs based on the unconstrained budget scenario. Under this theoretical scenario, the City would require around $22.7 million in the first year for rehabilitation of the paved road network. In addition, over a 20-year period the City would require $54.5 million in the 20-year period (or $2.75 million per year) for pavement rehabilitation to remove all backlog roads.

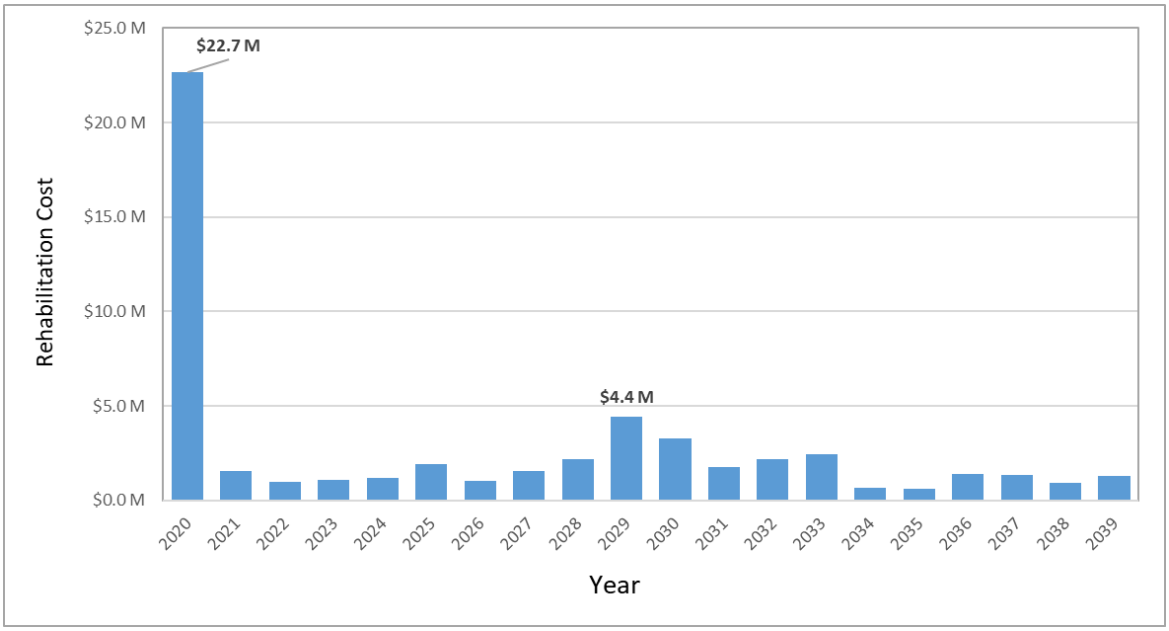


Figure 15: Rehabilitation Needs based on Unconstrained Budget Scenario

7.2 Constrained Budget Analysis

A road is said to be in backlog where there was not enough money to construct the most cost-effective rehabilitation. In other words, the road segments in poor to very poor condition, are defined as “backlog roads”. In order to evaluate the consequence of various budget scenarios, the backlog cost is used. The Backlog Cost is the cost that would need to be applied in a single year to eliminate the backlog. If the Backlog Cost is growing over time, the network is getting worse (i.e. more expensive to repair).

The effect of various funding levels in terms of Backlog Cost is also shown in Figure 16. The figure shows that the Backlog Cost is projected to increase from $19.4 M in 2019 to $23.1 M in 2039 with the City’s current budget ($2 million per year). Note that the current budget could sustain or even slightly reduce Backlog Cost in a mid-term by 2027, but it is not enough to mange the backlog roads for longer period.

To keep Backlog Cost around $19.5 M for next 20 years, a funding level of approximately $2.1 million per year on average is required. Figure 16 also indicates that the City would be able to reduce backlog costs with higher budgets.

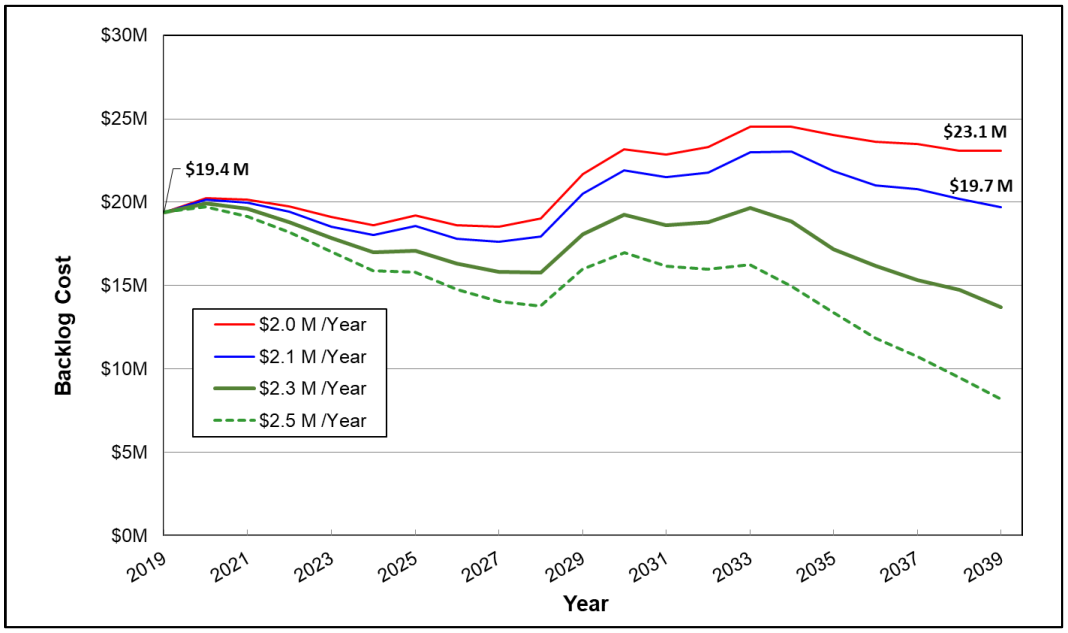


Figure 16: Future Backlog Projection based on Various Budget Scenarios

Figure 17 shows the average PCI value of the road network for different budget scenarios over a 20-year period. At the current budget of $2 million per year, the average condition continues to deteriorate while at budgets of over $2.1 million per year, the average condition stabilizes in the long-term.

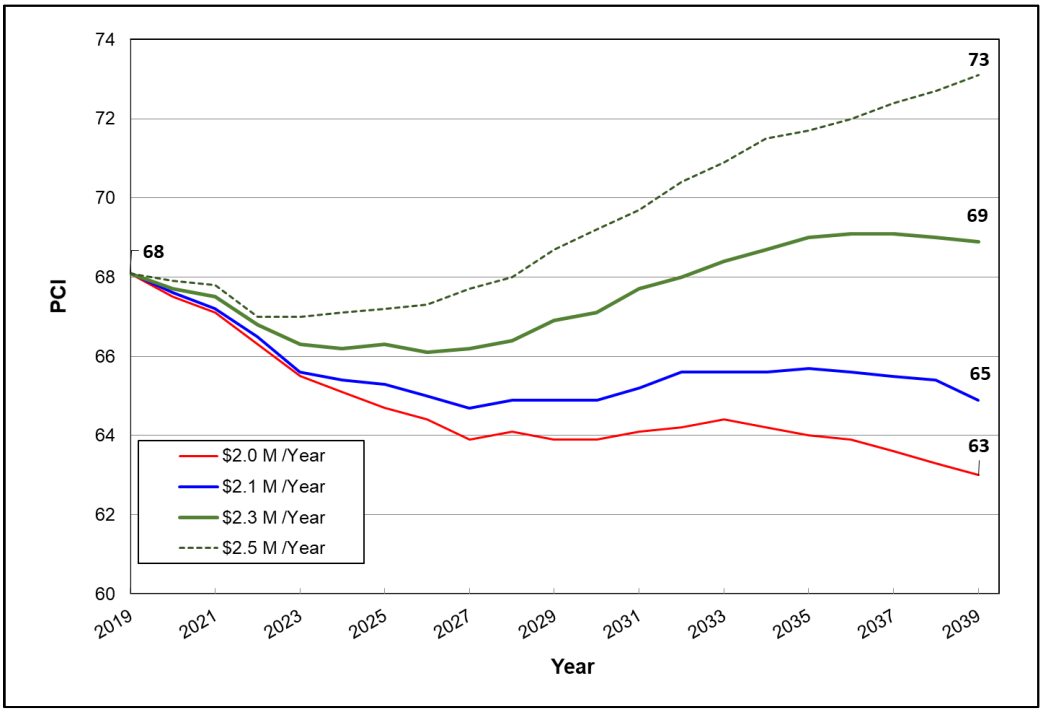


Figure 17: Predicted PCI for Different Budget Scenarios

7.3 Multi-Year Rehabilitation Program

The multi-year paving plan is provided based on the City's current capital budget of $2 million per year on average. Figure 18 shows shown a summary of the ten-year paving program based on treatment type and paving area. The unit cost per square meter of the treatment varies from $22.5 (Overlay 50 mm) to $180 (Reconstruction). The total annual pavement rehabilitation area varies from 38,000 m^2 to 62,000 m^2 (51,000 m^2 on average).

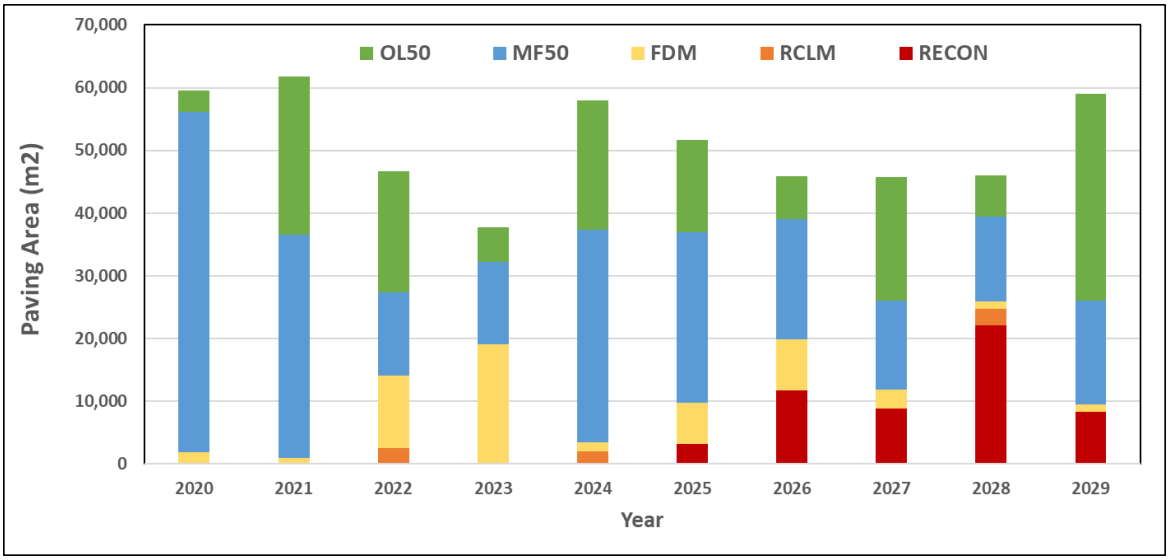


Figure 18: A Summary of Next Ten-Year Paving Program Based on the City's current budget

As described in Section 3.2, the historical annual area of paving (2013-2016) fluctuated between 41,000 m^2 and 89,000 m^2 with average of 64,000 m^2 per year.

A multi-year paving plan (map + spreadsheet) based upon $2 million / year for the paved road network is provided in Appendix C. This program includes only the rehabilitation treatments (not routine maintenance) chosen by the analysis. The rehabilitation program 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.

For the needs-based scenario (unconstraint budget), the City would require $54.5 million over a 20-year period remove all backlog roads. The constrained budgets investigated were an annual budget of $2 million (City's current budget), $2.1 million, $2.3 million, and $2.5 million for the road network rehabilitation. The Budget of $2.1 million per year for the asphalt paving was found to be necessary to sustain the condition and backlog cost of the road network over the next twenty years.

The pavement rehabilitation plan is developed at a network-level. At the time of implementation, project-level assessments and designs should be completed. The City should consider updating the plan with new data in four years. This will provide an opportunity to update deterioration model calibration, include new or rehabilitated

pavements in the plan. This timeframe is consistent with past City practice and other municipalities in western Canada.

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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10.0 REFERENCES

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APPENDIX A

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LIMITATIONS ON USE OF THIS DOCUMENT

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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.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless so stipulated in the Design Report, TETRA TECH was not retained to investigate, address or consider, and has not investigated, 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.

APPENDIX B

2019 PAVEMENT CONDITION

Map 1 - Pavement Condition Index (PCI)

Map 2 – Pavement Cracking (ACA)

2019 Pavement Condition Indices Spreadsheet

76000 78000 80000 82000

5878000 5876000 5874000

RGE RD 203 HWY 833 WILLIAM ST. RGE RD 201 RGE RD 200 RGE RD 204 RGE RD 205 RGE RD 202

68 ST. 53 ST. 59 ST. 57 ST. 46 ST. 49 ST. 47 ST. 58 ST. 39 ST. 71 ST. 73 ST. 66 ST. 68 ST. 53 ST. 47 ST. 41 ST. 36 ST. 38 ST. 57 ST. 52 ST. 48 ST. 45 ST. 54 ST. 69 ST. 75 ST. 65 ST. 55 ST. 43 ST. 41 ST. 39 ST. 38 ST. 76 ST. 63 ST. 50 ST. 68 ST.

56 AVE. 54 AVE. 52B AVE. 51 AVE. 49 AVE. 48B AVE. 48 AVE. 47 AVE. 46 AVE. 44B AVE. 45 AVE. 44 AVE. 43 AVE. 42A AVE. 39 AVE. 36 AVE. 35 AVE. 28 AVE.

Dirt Road TWP RD 471 Highway 13 HIGHWAY 26 HIGHWAY 13 CAMROSE DR. EXHIBITION DR. GRAVEL PIT RD. TWP RD 464

N W E S

LEGEND

PCI

- < 40
- 40 - 55
- 55 - 70
- 70 - 85
- 85 - 100
- Other Road - No Collection



NOTES
Base data source:
Imagery from ESRI Basemaps via City of Camrose, 2015.

STATUS
ISSUED FOR USE

CITY OF CAMROSE PAVEMENT CONDITION ASSESSMENT

2019 PCI for Paved Roadways

PROJECTION 3TM 114		**DATUM** NAD83		**CLIENT** City of Camrose
Scale: 1:28,000 0.4 0.2 0 0.4 Kilometres				TETRA TECH
FILE NO. PAVE03186-01_Roads_FigB1_PCI.mxd				
OFFICE Tt-VANC	**DWN** YL	**CKD** KR	**APVD** KR	**REV** 1
DATE December 17, 2019	**PROJECT NO.** TRN.PAVE03186-01			**Figure B1**

\\tt.localeba\Projects\VAN\74330\PAVE03186-01\GIS\Maps\PAVE03186-01_Roads_FigB1_PCI.mxd modified 2019-12-17 by york.law

76000 78000 80000 82000

5878000 5876000 5874000

HWY 833 | WILLIAM ST. | RGE RD 203 | RGE RD 201 | RGE RD 200 | RGE RD 204 | RGE RD 205 | RGE RD 202

68 ST. | 53 ST. | 59 ST. | 57 ST. | 46 ST. | 49 ST. | 47 ST. | 58 ST. | 71 ST. | 66 ST. | 73 ST. | 48 ST. | 45 ST. | 39 ST. | 41 ST. | 69 ST. | 75 ST. | 65 ST. | 63 ST. | 55 ST. | 54 ST. | 52 ST. | 50 ST. | 43 ST. | 38 ST. | 37 ST. | 36 ST.

56 AVE. | 54 AVE. | 52B AVE. | 51 AVE. | 49 AVE. | 48B AVE. | 48 AVE. | 47 AVE. | 46 AVE. | 44B AVE. | 45 AVE. | 44 AVE. | 43 AVE. | 42A AVE. | 39 AVE. | 36 AVE. | 35 AVE. | 28 AVE.

Dirt Road | TWP RD 471 | Highway 13 | HIGHWAY 26 | HIGHWAY 13 | CAMROSE DR. | EXHIBITION DR. | GRAVEL PIT RD.

TWP RD 464

N W E S

LEGEND

ACA

- 0 - 3
- 3 - 7
- 7 - 15
- 15 - 30
- 30 - 100
- Other Road - No Collection



NOTES
Base data source:
Imagery from ESRI Basemaps via
City of Camrose, 2015.

STATUS
ISSUED FOR USE

CITY OF CAMROSE
PAVEMENT CONDITION ASSESSMENT

2019 ACA for Paved Roadways

PROJECTION	DATUM	CLIENT
3TM 114	NAD83	City of Camrose

Scale: 1:28,000
0.4 0.2 0 0.4
Kilometres

TETRA TECH

FILE NO. PAVE03186-01_Roads_FigB2_ACA.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	YL	KR	KR	1

DATE December 17, 2019
PROJECT NO. TRN.PAVE03186-01

Figure B2

\\tt.localeba\Projects\VAN\74330\PAVE03186-01\GIS\Maps\PAVE03186-01_Roads_FigB2_ACA.mxd modified 2019-12-17 by york.law

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0010-010	100 EDGEWOOD CL	0	91	West End	100 EDGEWOOD CL_1	91	LOC	1.0	5.4	6.4	0.0	2	4.25	88.5	93.6
Ana-0010-020	100 EDGEWOOD CL	91	186	100 EDGEWOOD CL_1	EDGEWOOD DR	95	LOC	2.7	9.1	11.9	0.0	3	2.58	77.1	88.1
Ana-0020-010	100 EDGEWOOD CL_1	0	62	South End	100 EDGEWOOD CL	62	LOC	6.4	15.2	21.6	0.0	2		67.7	78.4
Ana-0030-010	100 PARKRIDGE CL	0	67	PARKRIDGE DR	Northeast End	67	LOC	1.4	2.5	3.8	0.0	2		86.4	96.2
Ana-0040-010	200 EDGEWOOD CL	0	158	EDGEWOOD DR	Northeast End	158	LOC	1.9	10.7	12.6	0.0	2	4.04	79.1	87.4
Ana-0050-010	200 PARKRIDGE CL	0	56	PARKRIDGE DR_1	Northeast End	56	LOC	2.5	12.2	14.7	0.5	4	5.82	75.6	85.3
Ana-0060-010	23 AVE	0	172	56 ST	57 ST	172	LOC	0.3	0.0	0.3	0.0	2	2.75	93.9	99.5
Ana-0070-010	23A AVE CL	1	63	56 ST	Southeast End	62	LOC	0.0	0.0	0.0	0.0	2	4.87	100	100.0
Ana-0080-010	24 AVE CL	137	213	West End	57 ST	76	LOC	0.0	0.0	0.0	0.0	1		100	100.0
Ana-0080-020	24 AVE CL	214	302	NO NAME	56 ST	88	LOC	0.0	0.0	0.0	0.0	2	2.99	100	100.0
Ana-0090-010	25 AVE	0	145	VALLEYVIEW DR		145	LOC	0.3	0.0	0.3	0.0	3	3.59	93.9	99.5
Ana-0090-020	25 AVE	145	261		56 ST	116	LOC	2.8	4.6	7.3	0.0	1	2.91	82.1	92.6
Ana-0100-010	25 AVE_WB	0	64	25 AVE	VALLEYVIEW DR	64	LOC	0.2	0.0	0.2	0.0	3	3.36	91.3	99.7
Ana-0110-010	26 AVE	0	92	63 ST	62 ST	92	LOC	0.3	1.7	2.0	0.3	3	2.80	87.7	98.0
Ana-0120-010	26 AVE CL	0	58	Northwest End	56 ST	58	LOC	0.0	0.0	0.0	0.0	2		100	100.0
Ana-0130-010	27 AVE	0	44	West End	63 ST	44	LOC	0.0	0.8	0.8	0.8	2		92.3	99.2
Ana-0140-010	27 AVE CL	0	61	Northwest End	56 ST	61	LOC	0.0	0.0	0.0	0.0	1		100	100.0
Ana-0150-010	28 AVE	0	75	63 ST	East End	75	LOC	0.0	0.0	0.0	0.0	2	3.43	100	100.0
Ana-0150-020	28 AVE	76	171	62 ST	61 ST CL	95	COL	0.0	0.0	0.0	0.6	2	3.07	94.1	99.9
Ana-0150-030	28 AVE	171	349	61 ST CL	60 ST CL	178	COL	0.1	0.0	0.1	0.3	2	3.88	92.3	75.0
Ana-0150-040	28 AVE	349	598	60 ST CL	59 ST CL	249	COL	0.5	1.6	2.2	0.0	2	2.53	93.9	97.8
Ana-0150-050	28 AVE	598	770	59 ST CL	VALLEYVIEW DR	172	COL	0.8	0.9	1.7	0.1	3	3.30	88.8	98.0
Ana-0150-070	28 AVE	770	860	VALLEYVIEW DR	57 ST	90	LOC	0.5	0.4	0.9	0.0	3	3.73	90.8	98.9
Ana-0150-080	28 AVE	860	968	57 ST	56 ST	108	LOC	0.6	1.0	1.6	0.0	2	3.46	87.9	98.1
Ana-0150-090	28 AVE	968	1079	56 ST	55 ST	111	LOC	0.9	3.1	4.0	0.0	2	3.80	90.1	96.0
Ana-0160-010	28A AVE CL	0	50	57 ST	East End	50	LOC	8.9	15.4	24.3	0.0	2	6.34	64.4	75.7
Ana-0160-020	28A AVE CL	51	127	West End	55 ST	76	LOC	0.0	0.4	0.4	0.0	1	7.21	99.8	99.6
Ana-0170-010	30 AVE	0	154	67 ST	30 AVE_1	154	LOC	7.2	25.2	32.5	0.0	2	4.03	62.8	75.0
Ana-0170-020	30 AVE	154	319	30 AVE_1	63 ST	165	LOC	4.0	15.3	19.3	0.1	2	4.14	74.3	80.7
Ana-0170-030	30 AVE	319	366	63 ST	East End	47	LOC	1.6	10.6	12.3	0.4	2	4.63	80.7	87.7
Ana-0170-040	30 AVE	367	486	62A ST	62 ST CL	119	LOC	4.5	26.4	30.9	0.0	2	3.41	66.1	75.0
Ana-0170-050	30 AVE	486	577	62 ST CL	61A ST	91	LOC	3.6	25.4	29.0	0.0	2	4.69	68.4	75.0
Ana-0180-010	30 AVE_1	0	30	30 AVE	North End	30	LOC	1.3	6.7	8.1	0.0	2		82.9	91.9
Ana-0190-010	300 EDGEWOOD CL	0	56	Southwest End	400 EDGEWOOD CL / EDGEWOOD DR	56	LOC	8.5	24.1	32.6	0.0	2		61.6	75.0
Ana-0200-010	300 PARKRIDGE CL	0	93	Southwest End	PARKRIDGE DR	93	LOC	7.4	34.7	42.0	0.3	3		58.1	75.0
Ana-0210-010	31 AVE	0	89	67 ST	66 ST CL	89	LOC	3.9	13.2	17.1	0.0	2	4.15	75.7	82.9
Ana-0210-020	31 AVE	89	176	66 ST CL	ELLIOTT DR	87	LOC	1.3	10.1	11.3	0.0	1	2.72	81.6	88.7
Ana-0220-010	32 AVE	0	170	67 ST	ELLIOTT DR	170	LOC	6.3	15.9	22.2	0.0	1	4.07	68.8	77.8
Ana-0220-020	32 AVE	170	261	ELLIOTT DR	64 ST	91	LOC	0.9	8.8	9.7	0.0	2	4.18	85.4	90.3
Ana-0220-030	32 AVE	262	479	ELLIOTT DR	61A ST	217	LOC	4.0	12.6	16.6	0.0	1	2.63	72.1	83.2
Ana-0230-010	33 AVE	0	86	67 ST	East End	86	LOC	0.3	6.9	7.3	0.3	2	2.62	88.9	92.7
Ana-0230-020	33 AVE	87	156	West End	52 ST	69	LOC	4.5	19.0	23.6	0.0	3	6.67	62.2	75.8
Ana-0240-010	33A AVE	0	183	52B ST	52 ST	183	LOC	5.6	12.6	18.2	0.0	2	5.24	69.2	81.6
Ana-0250-010	34 AVE	1	89	67 ST	East End	88	LOC	19.8	54.0	73.8	1.4	5	8.78	35.2	73.4
Ana-0250-020	34 AVE	90	160	Northwest End	ERICKSON DR	70	LOC	6.4	24.2	30.5	1.7	6		55.3	74.3
Ana-0250-030	34 AVE	161	252	52 ST	51 ST / 51 ST CL	91	COL	3.4	4.1	7.5	0.0	1	2.82	73.8	92.2
Ana-0250-040	34 AVE	252	342	51 ST / 51 ST CL	50B ST CL / NO NAME	90	COL	6.1	6.1	12.2	0.0	1	2.20	73.0	87.5
Ana-0250-050	34 AVE	342	411	50B ST CL / NO NAME	34 AVE_EB	69	COL	5.2	15.2	20.3	0.0	2	1.85	73.2	79.4
Ana-0250-060	34 AVE	411	492	34 AVE_EB	50 ST	81	COL	1.5	12.8	14.3	0.4	4	4.51	78.3	74.7
Ana-0260-010	34 AVE_EB	0	80	34 AVE	50 ST	80	COL	5.5	9.6	15.1	0.0	3	1.59	72.3	84.9
Ana-0270-010	35 AVE	0	174	67 ST	ELLIOTT DR	174	LOC	16.8	54.2	71.0	0.2	3	5.74	43.5	74.0
Ana-0270-020	35 AVE	174	307	ELLIOTT DR	64 ST	133	LOC	10.6	37.9	48.5	0.0	2	6.47	60.4	75.0
Ana-0270-030	35 AVE	308	377	Northwest End	ERICKSON DR	69	LOC	7.0	25.1	32.1	0.0	2		62.9	75.0
Ana-0270-040	35 AVE	378	607	61A ST	57 ST	229	LOC	4.2	11.3	15.5	0.1	2	3.41	77.2	84.5
Ana-0270-050	35 AVE	608	768	52A ST	52 ST	160	LOC	0.9	6.6	7.5	0.0	2	2.62	86.8	92.5
Ana-0280-010	36 AVE	0	207	ERICKSON DR	58 ST	207	LOC	9.3	18.9	28.2	2.9	3	7.27	42.3	72.2
Ana-0280-020	36 AVE	207	297	58 ST	57 ST	90	LOC	6.2	27.1	33.3	0.3	2	5.75	49.2	73.4
Ana-0280-030	36 AVE	298	418	Southwest End	52A ST	120	LOC	3.4	6.7	10.2	0.0	1	3.94	78.3	89.8
Ana-0280-040	36 AVE	418	626	52A ST	52 ST	208	LOC	2.5	3.6	6.1	0.0	1	3.71	83.7	93.9
Ana-0280-050	36 AVE	626	718	52 ST	51 ST	92	LOC	0.3	5.2	5.5	0.0	1	3.69	90.7	94.5
Ana-0290-010	36 ST	0	258	37 ST	47 AVE	258	COL	0.0	0.0	0.0	0.0	1	1.50	100	100.0
Ana-0290-020	36 ST	258	500	47 AVE	NO NAME / S 48TH AVE SERVICE RD	242	COL	0.8	0.7	1.5	0.0	1	2.05	94.7	98.5
Ana-0290-030	36 ST	500	574	NO NAME / S 48TH AVE SERVICE RD	48 AVE	74	COL	2.9	1.7	4.6	0.0	3	3.59	75.4	73.3
Ana-0300-010	37 AVE	0	131	West End	ERICKSON DR	131	LOC	5.2	17.2	22.4	2.8	6	11.44	49.2	76.1
Ana-0310-010	37 AVE CL	0	61	NO NAME	58 ST	61	LOC	9.4	10.8	20.2	3.8	4	4.11	44.8	75.9
Ana-0320-010	37 ST	989	1293	47 AVE	S 48TH AVE SERVICE RD	304	LOC	0.0	0.5	0.5	0.0	1	1.98	99.5	99.5
Ana-0330-010	37A AVE	0	168	76 ST	75 ST	168	LOC	0.1	0.2	0.3	0.0	2	9.35	96.8	99.7
Ana-0330-020	37A AVE	169	261	West End	69 ST	92	LOC	7.1	18.5	25.6	0.2	2		61.1	74.9
Ana-0330-030	37A AVE	261	348	69 ST	68A ST	87	LOC	2.5	10.1	12.6	0.1	3	5.02	78.7	87.4
Ana-0340-010	38 AVE	0	93	75 ST / MARLER DR	72 ST CL	93	COL	0.0	0.1	0.1	0.0	3	9.43	100	75.0
Ana-0340-020	38 AVE	93	179	72 ST CL	71 ST CL	86	COL	0.2	0.8	1.0	0.0	3	7.42	88.1	74.9
Ana-0340-030	38 AVE	179	223	71 ST CL	70 ST	44	COL	0.0	1.6	1.6	0.0	2	7.40	97.6	75.0
Ana-0340-040	38 AVE	223	345	70 ST	69 ST / 69A ST CL	122	COL	2.0	6.4	8.4	0.0	2	7.72	86.1	74.5
Ana-0340-050	38 AVE	346	456	69 ST	68A ST	110	LOC	2.7	9.2	12.0	0.3	3	4.75	72.4	88.0
Ana-0340-060	38 AVE	458	554	67 ST_1	65 ST / 66 ST	96	LOC	11.5	19.7	31.2	1.1	5	9.51	41.8	72.5
Ana-0350-010	38 AVE CL	0	305	Southeast End	63 ST	305	LOC	9.6	40.6	50.2	0.9	5	7.40	41.2	73.7
Ana-0350-020	38 AVE CL	306	397	NO NAME	58 ST	91	LOC	31.8	31.9	63.6	3.8	4		15.8	63.5
Ana-0360-010	38 ST	0	366	37 ST / 42 AVE	43 AVE	366	LOC	4.1	16.1	20.3	0.0	2	2.56	69.3	79.6
Ana-0360-020	38 ST	366	634	43 AVE	44 AVE	268	LOC	19.1	9.1	28.1	1.5	4	3.37	53.0	74.1
Ana-0360-030	38 ST	635	1016	47 AVE	S 48TH AVE SERVICE RD	381	COL	3.7	17.7	21.4	0.1	3	2.61	69.4	78.3
Ana-0370-010	38A AVE	0	99	76 ST	75 ST	99	LOC	0.2	0.0	0.2	0.0	2	5.99	89.9	99.8
Ana-0380-010	39 AVE	0	75	76 ST	75 ST	75	LOC	3.3	4.0	7.3	0.0	1	4.67	69.4	92.6
Ana-0380-020	39 AVE	76	192	64 ST	63 ST	116	LOC	5.0	9.9	14.8	0.8	3	6.29	61.5	84.4
Ana-0380-030	39 AVE	192	290	63 ST	62 ST	98	LOC	5.7	10.9	16.6	5.5	7	8.65	45.8	81.4
Ana-0380-040	39 AVE	290	564	62 ST	MOUNT PLEASANT DR	274	LOC	5.0	8.8	13.8	2.2	4	7.82	57.0	84.9
Ana-0380-050	39 AVE	565	749	39 AVE CL / 58 ST	57 ST	184	LOC	7.4	16.9	24.3	4.1	5	8.27	39.7	73.1
Ana-0380-060	39 AVE	750	811	PARKVIEW DR	56A ST CL	61	LOC	6.9	9.4	16.4	4.9	2	6.54	41.5	81.1
Ana-0380-070	39 AVE	811	862	56A ST CL	56 ST CL	51	LOC	1.5	8.3	9.8	0.6	2	6.68	77.8	90.2
Ana-0380-080	39 AVE	862	972	56 ST CL	NO NAME	110	LOC	0.5	2.8	3.2	0.2	2	6.87	88.7	96.8
Ana-0380-090	39 AVE	972	1134	NO NAME	East End	162	LOC	0.9	2.7	3.5	0.0	2	5.52	90.6	96.5
Ana-0390-010	39 AVE CL	0	117	69 ST	East End	117	LOC	12.0	26.3	38.2	0.0	2	3.59	59.4	75.0
Ana-0390-020	39 AVE CL	118	245	Southwest End	39 AVE / 58 ST	127	LOC	21.4	21.7	43.1	6.2	4	4.91	29.9	65.9
Ana-0400-010	39 ST	0	219	39 ST (NEW SALEM RD) / CAMROSE DR / NO N	42 AVE	219	ART	19.3	16.5	35.8	0.9	12	4.03	22.0	66.7
Ana-0400-020	39 ST	219	854	42 AVE	44 AVE	635	ART	0.2	0.5	0.7	4.2	5	1.83	70.6	98.8
Ana-0400-030	39 ST	854	1320	44 AVE	47 AVE	466	ART	0.0	0.3	0.3	0.0	4	2.72	88.8	99.7
Ana-0400-040	39 ST	1320	1562	47 AVE	North End	242	ART	0.1	0.3	0.4	0.3	3	2.94	97.7	99.6
Ana-0400-050	39 ST	1563	1652	39 ST_SB	S 48TH AVE SERVICE RD	89	ART	1.2	2.2	3.4	0.8	4	4.10	72.2	74.9
Ana-0400-060	39 ST	1652	1673	S 48TH AVE SERVICE RD	North End	21	ART	0.0	2.0	2.0	0.0	4	7.01	65.9	75.0
Ana-0400-070	39 ST	1674	2035	48 AVE WB	North End	361	ART	1.8	4.5	6.2	1.7	3	3.19	76.6	93.1
Ana-0400-080	39 ST	2036	2496	39 ST_SB	NO NAME	460	ART	0.0	0.0	0.0	0.0	2	1.78	100	95.5
Ana-0400-090	39 ST	2496	2710	NO NAME	NO NAME	214	ART	0.0	1.0	1.0	0.5	3	2.45	91.4	85.8
Ana-0400-100	39 ST	2710	2886	NO NAME	54 AVE	176	ART	0.5	0.9	1.3	0.9	4	1.70	87.1	86.1
Ana-0410-010	39 ST_SB	0	106	39 ST	North End	106	ART	1.7	2.5	4.3	2.9	6	4.83	60.7	74.3
Ana-0410-020	39 ST_SB	107	369	48 AVE WB	51 AVE	262	ART	6.6	8.1	14.7	1.7	6	3.49	43.5	82.8
Ana-0410-030	39 ST_SB	369	464	51 AVE	39 ST	95	ART	0.4	0.3	0.7	0.0	2	3.24	86.4	99.2
Ana-0420-010	40 AVE	0	79	76 ST	75 ST	79	LOC	2.5	5.5	8.1	0.0	2	4.28	83.8	91.9

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0430-010	40 AVE CL	0	121	69 ST	East End	121	LOC	3.4	15.6	19.0	0.0	2	5.57	69.6	80.6
Ana-0440-010	400 EDGEWOOD CL	0	55	300 EDGEWOOD CL / EDGEWOOD DR	Northeast End	55	LOC	8.6	10.6	19.2	0.0	2		69.2	80.8
Ana-0450-010	400 PARKRIDGE CL	0	43	PARKRIDGE DR	Southeast End	43	LOC	2.6	4.2	6.8	0.0	2		79.4	93.2
Ana-0460-010	41 AVE	0	117	West End	75 ST	117	COL	3.6	14.9	18.5	0.0	1	3.43	72.4	81.5
Ana-0460-020	41 AVE	117	255	75 ST	MARLER DR	138	COL	3.3	22.4	25.7	0.0	2	3.39	69.5	75.0
Ana-0460-030	41 AVE	256	351	42 AVE	63 ST	95	LOC	2.0	13.5	15.5	0.0	5	6.55	80.0	84.5
Ana-0460-040	41 AVE	352	443	60 ST	59 ST	91	LOC	10.0	14.9	24.9	1.9	7	9.16	42.4	72.8
Ana-0460-050	41 AVE	444	702	Northeast End	42 AVE	258	LOC	16.8	44.9	61.7	4.9	5	5.94	29.0	71.8
Ana-0470-010	41 ST	168	802	42 AVE	44 AVE	634	COL	0.3	1.2	1.5	0.0	2	2.90	95.5	98.5
Ana-0470-020	41 ST	802	916	44 AVE	NO NAME	114	COL	14.8	26.1	40.9	6.3	4	4.45	37.3	71.7
Ana-0470-030	41 ST	916	1077	NO NAME	NO NAME	161	COL	30.5	21.4	51.9	27.4	6	4.32	14.9	61.4
Ana-0470-040	41 ST	1077	1267	NO NAME	47 AVE	190	COL	13.1	14.4	27.6	6.5	5	5.07	33.2	71.0
Ana-0470-050	41 ST	1267	1613	47 AVE	48 AVE	346	COL	6.2	8.1	14.3	5.0	5	4.65	66.1	73.2
Ana-0470-060	41 ST	1614	1948	48 AVE WB	51 AVE	334	COL	2.6	19.5	22.1	17.9	4	4.97	51.8	75.0
Ana-0470-070	41 ST	1949	2053	52 AVE	52A AVE	104	LOC	0.3	0.6	0.9	0.0	2	8.04	95.7	99.1
Ana-0470-080	41 ST	2053	2180	52A AVE	52B AVE	127	LOC	1.5	4.1	5.6	0.0	4	8.95	79.6	94.0
Ana-0480-010	42 AVE	0	56	Southwest End	75 ST	56	LOC	1.7	16.7	18.4	0.0	2		75.1	81.6
Ana-0480-020	42 AVE	57	134	72 ST	71 ST	77	LOC	15.8	55.8	71.6	0.0	1	6.89	52.3	75.0
Ana-0480-030	42 AVE	135	257	Northwest End	69 ST	122	LOC	2.7	11.1	13.8	0.0	2	4.55	84.1	86.2
Ana-0480-040	42 AVE	257	346	69 ST	East End	89	LOC	0.9	1.1	2.1	0.0	2	2.91	90.5	97.9
Ana-0480-050	42 AVE	347	447	West End	67 ST	100	LOC	6.1	21.9	28.0	25.2	5	6.06	38.0	74.1
Ana-0480-060	42 AVE	447	539	67 ST	66 ST	92	LOC	4.5	13.8	18.2	0.8	2	3.67	64.0	81.2
Ana-0480-070	42 AVE	540	610	41 AVE	63 ST	70	LOC	5.9	32.1	38.1	0.4	3	6.59	59.3	75.0
Ana-0480-080	42 AVE	610	774	63 ST	62 ST	164	LOC	4.7	13.9	18.7	0.7	3	5.48	66.1	80.6
Ana-0480-090	42 AVE	774	883	62 ST	MOUNT PLEASANT DR	109	LOC	1.6	4.5	6.1	1.0	4	6.21	74.5	93.2
Ana-0480-100	42 AVE	883	989	MOUNT PLEASANT DR	60 ST / 60 ST CL	106	LOC	8.8	27.6	36.4	5.1	6	6.81	30.3	71.7
Ana-0480-110	42 AVE	989	1129	60 ST / 60 ST CL	59 ST CL	140	LOC	15.7	22.0	37.8	1.5	5	5.65	28.6	69.9
Ana-0480-120	42 AVE	1129	1230	59 ST CL	58 ST CL	101	LOC	11.9	11.8	23.7	0.7	5	6.58	40.6	71.9
Ana-0480-130	42 AVE	1230	1347	58 ST CL	41 AVE	117	LOC	17.4	16.8	34.2	3.1	3	5.06	28.3	67.1
Ana-0480-140	42 AVE	1347	1447	41 AVE	MARLER DR	100	LOC	10.2	14.0	24.2	4.1	4	6.19	37.1	71.1
Ana-0480-150	42 AVE	1448	1679	41 ST	39 ST	231	COL	1.1	6.3	7.4	0.4	2	3.81	79.0	74.6
Ana-0480-160	42 AVE	1679	1924	39 ST	37 ST / 38 ST	245	COL	4.8	10.7	15.4	0.6	4	3.24	59.5	83.2
Ana-0490-010	42 AVE CL	0	112	Southwest End	73 ST	112	LOC	0.5	2.5	3.0	0.0	3	3.06	92.0	97.0
Ana-0500-010	42 ST	0	149	49 AVE	50 AVE	149	LOC	5.0	28.1	33.1	5.5	3	3.96	48.7	74.1
Ana-0500-020	42 ST	149	220	50 AVE	NO NAME	71	LOC	7.6	20.1	27.7	0.9	3	5.64	57.1	74.3
Ana-0500-030	42 ST	221	315	52 AVE	52A AVE	94	LOC	0.4	1.6	2.0	0.0	2	6.89	93.5	98.0
Ana-0500-040	42 ST	315	457	52A AVE	52B AVE	142	LOC	1.6	2.3	3.9	0.0	1	10.05	86.0	96.1
Ana-0510-010	42A AVE	0	83	69 ST	East End	83	LOC	0.9	17.6	18.6	0.0	2	5.58	74.9	81.3
Ana-0520-010	43 AVE	0	85	75 ST	74 ST	85	COL	5.4	18.0	23.5	0.0	2	4.74	66.9	73.6
Ana-0520-020	43 AVE	85	183	74 ST	73 ST	98	COL	1.2	6.1	7.3	0.0	2	3.45	87.1	92.7
Ana-0520-030	43 AVE	183	276	73 ST	72 ST	93	COL	2.6	7.4	10.0	0.0	1	6.56	78.9	74.4
Ana-0520-040	43 AVE	276	381	72 ST	71 ST	105	COL	2.8	9.6	12.3	0.0	1	4.82	76.8	74.3
Ana-0520-050	43 AVE	381	500	71 ST	69 ST / 70 ST	119	COL	10.9	14.2	25.1	0.0	1	4.17	65.7	72.3
Ana-0520-060	43 AVE	501	595	67 ST	66 ST	94	LOC	4.4	17.6	22.0	0.0	2	2.96	67.3	78.0
Ana-0520-070	43 AVE	596	688	66 ST	65 ST	92	LOC	0.7	5.4	6.1	0.7	2	4.45	80.6	93.9
Ana-0520-080	43 AVE	688	789	65 ST	64 ST CL	101	COL	20.5	19.6	40.1	1.4	2	5.21	40.6	69.3
Ana-0520-090	43 AVE	789	883	64 ST CL	63 ST	94	COL	3.7	4.6	8.3	0.3	4	3.83	64.5	74.1
Ana-0520-100	43 AVE	883	960	63 ST	63 ST	77	COL	0.9	3.7	4.7	0.0	3	4.07	87.6	74.8
Ana-0520-110	43 AVE	960	1088	63 ST	62 ST	128	COL	1.4	4.4	5.8	0.0	2	3.48	84.9	94.2
Ana-0520-120	43 AVE	1088	1196	62 ST	MOUNT PLEASANT DR	108	COL	6.7	7.5	14.2	0.4	2	3.69	52.6	72.0
Ana-0520-130	43 AVE	1196	1448	MOUNT PLEASANT DR	59 ST	252	COL	3.6	6.6	10.3	0.4	1	4.06	71.4	73.9
Ana-0520-140	43 AVE	1448	1925	59 ST	MARLER DR	477	COL	1.6	2.5	4.1	0.1	2	3.34	84.6	95.5
Ana-0520-150	43 AVE	1926	2018	55 ST	East End	92	LOC	7.8	17.1	25.0	0.3	2		45.3	72.8
Ana-0520-160	43 AVE	2019	2278	53 ST	52 ST	259	LOC	10.8	16.0	26.8	3.1	6	5.80	41.6	71.1
Ana-0520-170	43 AVE	2279	2440	38 ST		161	LOC	6.5	14.9	21.4	0.0	2	2.47	64.6	78.1
Ana-0530-010	43 ST	0	379	South End	44 AVE	379	COL	1.8	2.4	4.2	0.0	3	5.33	89.1	74.5
Ana-0530-030	43 ST	535	694	49 AVE	50 AVE	159	LOC	12.3	22.3	34.5	2.0	4	6.23	43.2	72.1
Ana-0530-040	43 ST	694	799	50 AVE	North End	105	LOC	5.2	17.5	22.7	0.2	2	3.56	58.8	76.6
Ana-0530-050	43 ST	800	880	52 AVE	52A AVE	80	LOC	0.8	2.4	3.2	0.1	2		90.0	96.7
Ana-0530-060	43 ST	880	1021	52A AVE	52B AVE	141	LOC	0.6	1.2	1.8	0.1	2	6.83	93.2	98.0
Ana-0540-010	43A AVE CL	0	101	West End	63 ST	101	LOC	8.4	20.7	29.1	13.5	7	7.72	31.7	72.3
Ana-0550-010	44 AVE	0	42	West End	75 ST	42	LOC	0.0	0.0	0.0	0.0	1	5.25	100	100.0
Ana-0550-020	44 AVE	42	132	75 ST	74 ST	90	LOC	0.3	0.2	0.5	0.0	1	3.52	95.5	99.5
Ana-0550-030	44 AVE	132	229	74 ST	44 AVE CL / 73 ST	97	LOC	0.0	0.6	0.6	0.0	1	2.76	99.2	99.4
Ana-0550-040	44 AVE	230	317	67 ST	66A ST	87	LOC	0.4	0.0	0.4	0.0	1	5.18	91.8	99.3
Ana-0550-050	44 AVE	317	427	66A ST	66 ST	110	LOC	1.7	3.5	5.2	0.3	2	4.76	83.8	94.7
Ana-0550-060	44 AVE	428	676	MOUNT PLEASANT DR	59 ST	248	LOC	9.7	33.7	43.3	10.5	4	7.98	27.0	71.1
Ana-0550-070	44 AVE	779	836		ARENA PARKING LOT ACCESS RD	57	LOC	1.8	4.7	6.5	0.1	2	3.16	77.3	92.8
Ana-0550-080	44 AVE	836	987	ARENA PARKING LOT ACCESS RD	55 ST	151	LOC	10.6	19.9	30.6	0.7	3	2.82	34.1	71.6
Ana-0550-090	44 AVE	987	1193	55 ST	53 ST	206	COL	11.4	18.2	29.6	0.7	3	4.30	42.4	70.8
Ana-0550-100	44 AVE	1193	1306	53 ST	52A ST	113	COL	4.5	14.4	18.9	0.0	3	4.27	69.7	73.7
Ana-0550-110	44 AVE	1306	1403	52A ST	52 ST	97	COL	5.1	8.3	13.4	2.2	6	3.67	54.2	72.7
Ana-0550-120	44 AVE	1403	1556	52 ST	50 ST	153	COL	4.0	5.5	9.5	1.0	2	4.55	67.7	73.4
Ana-0550-130	44 AVE	1557	1961	43 ST	41 ST	404	COL	2.9	3.6	6.5	0.0	2	3.81	74.2	73.9
Ana-0550-140	44 AVE	1961	2195	41 ST	39 ST	234	COL	5.3	11.1	16.3	2.4	3	2.97	51.6	81.3
Ana-0550-150	44 AVE	2195	2441	39 ST	38 ST	246	COL	5.5	28.3	33.8	4.4	3	3.27	42.8	74.1
Ana-0550-160	44 AVE	2441	2550	38 ST	37 ST	109	COL	0.3	1.6	1.9	0.1	1	3.02	93.5	98.0
Ana-0550-170	44 AVE	2550	2650	37 ST	37 ST	100	COL	0.0	0.0	0.0	0.0	1	0.91	100	100.0
Ana-0560-010	44 AVE CL	0	91	44 AVE / 73 ST	East End	91	LOC	0.0	0.2	0.2	0.3	3	5.10	96.8	99.8
Ana-0570-010	44 ST	0	198	47 AVE	48 AVE	198	COL	4.3	9.8	14.0	2.0	3	3.77	57.5	73.5
Ana-0570-020	44 ST	199	358	49 AVE	50 AVE	159	LOC	10.0	16.6	26.7	1.4	2	2.40	47.9	72.8
Ana-0570-030	44 ST	358	500	50 AVE	NO NAME	142	LOC	5.7	18.5	24.1	0.8	2	4.67	58.8	75.4
Ana-0570-040	44 ST	501	562	52 AVE	52A AVE	61	LOC	0.0	0.7	0.7	0.2	3		98.4	99.3
Ana-0570-050	44 ST	562	704	52A AVE	52B AVE	142	LOC	1.0	2.3	3.3	0.2	2	8.15	86.0	96.5
Ana-0580-010	44A AVE	0	140	Southwest End	63 ST	140	LOC	7.0	19.2	26.2	1.3	6	8.74	61.6	75.0
Ana-0580-020	44A AVE	141	220	53 ST	52A ST	79	LOC	6.6	11.1	17.7	0.0	2	2.03	67.7	82.3
Ana-0590-010	44A AVE CL	0	88	73 ST	East End	88	LOC	0.0	1.5	1.5	0.0	3	5.00	97.9	98.5
Ana-0600-010	44B AVE	0	90	75 ST	74 ST	90	LOC	0.0	0.0	0.0	0.0	2	3.43	100	100.0
Ana-0600-020	44B AVE	90	227	74 ST	73 ST	137	LOC	0.0	0.3	0.3	0.0	2	3.07	99.7	99.7
Ana-0600-030	44B AVE	228	348	67 ST	66 ST	120	LOC	0.0	0.0	0.0	0.0	2	3.33	100	100.0
Ana-0600-040	44B AVE	348	438	66 ST	66 ST	90	LOC	0.0	0.1	0.1	0.0	2	3.74	100	99.9
Ana-0600-050	44B AVE	440	634	65 ST	63 ST	194	LOC	4.9	13.9	18.7	1.1	2	5.15	62.6	80.2
Ana-0600-060	44B AVE	634	841	63 ST	62 ST	207	LOC	5.3	13.0	18.3	1.0	2	5.67	58.5	80.4
Ana-0610-010	45 AVE	0	44	West End	75 ST	44	COL	0.0	0.0	0.0	0.0	2	3.95	100	75.0
Ana-0610-020	45 AVE	44	128	75 ST	74 ST	84	COL	0.0	0.0	0.0	0.3	3	2.96	97.9	99.9
Ana-0610-030	45 AVE	128	211	74 ST	73A ST	83	COL	0.0	0.0	0.0	0.4	2	3.22	97.1	99.9
Ana-0610-040	45 AVE	211	324	73A ST	73 ST	113	COL	1.3	5.0	6.4	0.1	4	2.80	91.2	93.5
Ana-0610-050	45 AVE	324	368	73 ST	NO NAME	44	COL	6.3	20.8	27.1	0.4	3	8.31	63.4	73.1
Ana-0610-060	45 AVE	368	431	NO NAME	BLANK_1	63	COL	0.1	0.4	0.6	0.2	2	4.31	91.1	75.0
Ana-0610-070	45 AVE	431	530	BLANK_1	NO NAME	99	COL	0.1	0.2	0.3	0.1	2	3.50	90.4	74.9
Ana-0610-080	45 AVE	530	631	NO NAME	NO NAME	101	COL	0.1	0.2	0.2	0.2	2	3.78	93.9	75.0
Ana-0610-090	45 AVE	631	729	NO NAME	69 ST	98	COL	0.1	0.5	0.6	0.1	2	3.98	92.9	75.0
Ana-0610-100	45 AVE	729	807	69 ST	68 ST SB	78	COL	1.3	3.3	4.6	0.0	5	5.55	63.6	74.2
Ana-0610-110	45 AVE	807	924	68 ST SB	67 ST	117	COL	4.7	7.7	12.4	0.2	4	5.46	63.5	73.6
Ana-0610-120	45 AVE	924	1020	67 ST	66 ST CL	96	COL	3.4	6.0	9.4	0.3	2	3.05	71.0	89.7
Ana-0610-130	45 AVE	1020	1069	66 ST CL	66 ST	49	COL	9.9	22.3	32.2	1.5	3	4.68	31.7	69.4
Ana-0610-140	45 AVE	1069	1198	66 ST	65 ST	129	COL	7.4	26.7	34.1	0.9	2	5.98	45.5	72.0

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0610-150	45 AVE	1198	1608	65 ST	62 ST	410	COL	2.1	6.1	8.2	0.1	1	2.18	81.7	91.7
Ana-0610-160	45 AVE	1608	1648	62 ST	COMP RD	40	COL	1.7	3.9	5.6	0.0	2	4.09	83.2	74.6
Ana-0610-170	45 AVE	1648	1711	COMP RD	61 ST	63	COL	4.3	9.6	14.0	0.3	1	2.59	73.0	86.0
Ana-0610-180	45 AVE	1711	1799	61 ST	MOUNT PLEASANT DR	88	COL	11.5	14.5	26.0	1.1	2	3.15	54.8	74.4
Ana-0610-190	45 AVE	1800	1947	ARENA PARKING LOT ACCESS RD	55 ST	147	LOC	0.0	0.7	0.7	0.0	1	3.39	99.1	99.3
Ana-0610-200	45 AVE	1947	2045	55 ST	54 ST	98	LOC	0.0	2.0	2.0	0.0	2	1.91	95.9	98.0
Ana-0610-210	45 AVE	2045	2151	54 ST	53 ST	106	LOC	3.2	0.9	4.1	0.0	2	2.13	64.8	94.1
Ana-0610-220	45 AVE	2152	2261	53 ST	52A ST	109	LOC	5.4	19.6	25.1	0.8	2		58.9	74.6
Ana-0620-010	45 ST	0	197	46 AVE	47 AVE	197	LOC	0.8	3.1	3.9	0.0	1	7.54	86.4	95.9
Ana-0620-020	45 ST	197	395	47 AVE	48 AVE	198	LOC	3.0	11.3	14.3	0.5	2	6.12	71.8	85.4
Ana-0620-030	45 ST	396	555	49 AVE	50 AVE	159	LOC	5.3	18.7	24.0	1.9	3	5.68	56.6	75.5
Ana-0620-040	45 ST	556	715	50 AVE	NO NAME	159	LOC	7.9	17.0	24.9	0.4	5	6.19	56.7	74.3
Ana-0620-060	45 ST	762	900	52 AVE / 52A AVE	52B AVE	138	LOC	0.4	0.9	1.3	0.0	2	7.07	92.0	98.5
Ana-0630-010	45A AVE	0	88	West End	65 ST	88	LOC	7.4	21.4	28.7	0.7	5		62.3	75.0
Ana-0630-020	45A AVE	89	187	53 ST	52A ST	98	LOC	4.6	15.8	20.4	0.6	3	4.71	57.9	78.7
Ana-0640-010	46 AVE	0	84	75 ST	74 ST	84	LOC	0.0	2.8	2.8	0.0	2	4.72	96.5	97.2
Ana-0640-020	46 AVE	84	166	74 ST	73A ST	82	LOC	0.0	6.2	6.2	0.0	1	6.80	91.9	93.8
Ana-0640-030	46 AVE	167	333	73 ST	71 ST CL	166	LOC	1.5	2.7	4.3	0.0	3	7.44	89.2	95.7
Ana-0640-040	46 AVE	333	550	71 ST CL	69 ST	217	LOC	2.4	4.0	6.4	0.1	2	8.11	85.9	93.6
Ana-0640-050	46 AVE	551	725	West End	65 ST	174	LOC	4.0	9.5	13.5	0.5	4	7.93	65.4	86.0
Ana-0640-060	46 AVE	726	841	57 ST	56 ST	115	LOC	0.0	3.1	3.1	0.0	2	3.42	94.4	96.9
Ana-0640-070	46 AVE	841	1055	56 ST	54 ST	214	LOC	0.3	1.3	1.6	0.1	2	2.76	90.7	98.2
Ana-0640-080	46 AVE	1055	1160	54 ST	53 ST	105	LOC	0.9	3.7	4.6	0.0	1	3.04	83.4	95.2
Ana-0640-090	46 AVE	1161	1204	52 ST	East End	43	LOC	2.3	6.0	8.3	0.0	2		75.9	91.3
Ana-0640-100	46 AVE	1205	1320	50 ST	49 ST / AUGUSTANA S	115	LOC	11.5	23.3	34.8	3.0	4	6.75	34.5	71.9
Ana-0640-110	46 AVE	1320	1420	49 ST / AUGUSTANA S	48 ST	100	LOC	11.2	37.0	48.2	4.8	4	3.59	30.1	73.2
Ana-0640-120	46 AVE	1420	1463	48 ST	48 ST	43	LOC	12.0	31.7	43.7	11.1	4	3.69	24.4	71.5
Ana-0640-130	46 AVE	1463	1574	48 ST	47 ST	111	LOC	8.7	38.0	46.7	1.7	3	4.21	41.4	74.0
Ana-0640-140	46 AVE	1574	1692	47 ST	46 ST	118	LOC	7.0	29.5	36.6	2.5	3	2.56	35.6	73.2
Ana-0640-150	46 AVE	1692	1809	46 ST	45 ST	117	LOC	0.4	2.5	3.0	0.4	2	3.01	93.4	96.8
Ana-0650-010	46 ST	0	165	South End	46 AVE	165	LOC	3.1	35.8	38.9	3.2	3	6.54	49.7	73.9
Ana-0650-020	46 ST	165	368	46 AVE	47 AVE	203	LOC	1.0	15.3	16.4	16.1	4	5.60	63.3	83.6
Ana-0650-030	46 ST	368	567	47 AVE	48 AVE	199	COL	0.9	16.0	16.9	12.8	4	5.53	62.5	75.0
Ana-0650-040	46 ST	568	735	48 AVE WB	49 AVE	167	COL	0.0	0.7	0.7	0.0	2	4.19	99.2	75.0
Ana-0650-050	46 ST	735	790	49 AVE	49 AVE	55	COL	0.0	1.2	1.2	0.0	1	3.69	98.6	75.0
Ana-0650-060	46 ST	790	895	49 AVE	50 AVE	105	COL	5.9	9.5	15.3	8.1	3	5.32	58.3	74.1
Ana-0650-070	46 ST	895	961	50 AVE	50 AVE	66	COL	9.2	16.1	25.3	17.2	5	5.74	34.0	73.7
Ana-0650-080	46 ST	961	1125	50 AVE	51 AVE	164	COL	8.3	8.2	16.4	77.9	7	5.30	25.6	66.0
Ana-0650-090	46 ST	1131	1235	52 AVE	52B AVE	104	LOC	0.0	0.7	0.7	0.0	3	3.62	99.4	99.3
Ana-0650-100	46 ST	1235	1426	52B AVE	53 AVE	191	LOC	0.5	3.4	3.9	0.0	4	4.17	91.2	96.1
Ana-0650-110	46 ST	1426	1629	53 AVE	54 AVE	203	LOC	0.2	1.4	1.6	0.1	2	5.37	92.5	98.4
Ana-0660-010	47 AVE	0	106	61 ST	MONTJOY AVE	106	LOC	5.3	15.6	20.8	0.8	5	5.65	64.7	79.1
Ana-0660-020	47 AVE	106	279	MONTJOY AVE	MOUNT PLEASANT DR	173	LOC	4.3	17.2	21.5	0.3	2	4.64	63.7	78.1
Ana-0660-030	47 AVE	280	389	MOUNT PLEASANT DR	MONTCLARE AVE	109	COL	0.7	3.8	4.5	0.9	1	2.85	82.5	95.3
Ana-0660-040	47 AVE	389	515	MONTCLARE AVE	57 ST	126	COL	2.6	5.8	8.4	0.4	1	2.74	77.6	91.0
Ana-0660-050	47 AVE	515	633	57 ST	56 ST	118	COL	2.6	7.0	9.6	1.2	1	2.44	69.9	89.6
Ana-0660-060	47 AVE	633	751	56 ST	55 ST	118	COL	1.6	7.9	9.5	0.0	1	2.31	83.0	90.5
Ana-0660-070	47 AVE	751	850	55 ST	54 ST	99	COL	4.1	13.9	18.0	0.0	1	4.18	68.5	73.9
Ana-0660-080	47 AVE	850	950	54 ST	53 ST	100	COL	2.8	8.9	11.6	0.0	1	3.27	72.0	88.0
Ana-0660-090	47 AVE	950	1038	53 ST	52 ST	88	COL	6.8	5.2	12.0	0.7	1	2.83	52.5	85.5
Ana-0660-100	47 AVE	1038	1094	52 ST	51A ST	56	COL	5.6	13.3	18.9	1.3	2	2.95	52.6	79.8
Ana-0660-110	47 AVE	1094	1138	51A ST	TRAIL 169	44	COL	5.1	8.9	13.9	1.5	3	6.47	51.3	73.2
Ana-0660-120	47 AVE	1138	1197	TRAIL 169	51 ST	59	COL	2.4	3.2	5.7	0.2	2	3.34	85.5	93.9
Ana-0660-130	47 AVE	1197	1293	51 ST	50 ST_SB	96	COL	5.2	7.4	12.6	1.2	2	3.51	57.8	73.3
Ana-0660-140	47 AVE	1293	1417	50 ST_SB	49 ST	124	COL	2.4	5.9	8.3	0.1	2	3.09	76.1	91.3
Ana-0660-150	47 AVE	1417	1517	49 ST	48 ST	100	COL	0.7	3.3	4.0	0.0	2	2.76	92.2	96.0
Ana-0660-160	47 AVE	1517	1670	48 ST	47 ST	153	COL	0.5	3.2	3.6	0.0	2	3.64	91.5	74.9
Ana-0660-170	47 AVE	1670	1788	47 ST	46 ST	118	COL	6.4	13.5	20.0	0.9	2	3.25	57.8	79.1
Ana-0660-180	47 AVE	1788	1904	46 ST	45 ST	116	COL	4.1	12.5	16.6	0.7	1	3.07	66.3	82.8
Ana-0660-190	47 AVE	1904	2015	45 ST	44 ST	111	COL	4.5	12.5	17.0	0.0	1	3.88	71.9	73.9
Ana-0660-200	47 AVE	2017	2250	41 ST	39 ST	233	COL	0.1	1.5	1.6	0.1	2	2.60	93.0	98.3
Ana-0660-210	47 AVE	2250	2614	39 ST	38 ST	364	COL	2.4	4.5	6.9	0.2	2	2.42	81.1	93.1
Ana-0660-220	47 AVE	2614	2777	38 ST	Southeast End	163	COL	0.2	1.1	1.3	0.2	2	2.08	93.7	98.5
Ana-0660-230	47 AVE	2778	2979	37 ST	36 ST	201	COL	0.0	0.4	0.4	0.0	1	1.83	99.7	99.6
Ana-0670-010	47 ST	0	150	South End	46 AVE	150	LOC	2.2	5.0	7.3	0.0	1	4.53	77.4	92.4
Ana-0670-020	47 ST	150	353	46 AVE	47 AVE	203	LOC	1.1	4.4	5.5	0.3	2	5.81	87.7	94.4
Ana-0670-030	47 ST	353	552	47 AVE	48 AVE	199	LOC	4.5	8.3	12.8	0.1	2	4.35	67.0	86.4
Ana-0670-040	47 ST	553	799	48 AVE WB	49 AVE	246	LOC	11.5	12.3	23.8	1.1	3	7.25	41.0	72.1
Ana-0670-050	47 ST	799	972	49 AVE	50 AVE	173	LOC	0.2	0.4	0.6	0.0	3	3.14	97.4	99.3
Ana-0670-060	47 ST	1145	1426	48 ST / 52 AVE	53 AVE	281	COL	4.3	7.6	11.8	0.4	3	3.56	66.3	73.7
Ana-0670-070	47 ST	1426	1491	53 AVE	NO NAME	65	COL	2.4	5.8	8.2	0.0	3	2.83	79.2	91.7
Ana-0670-080	47 ST	1491	1628	NO NAME	54 AVE	137	COL	5.9	8.0	13.9	0.9	4	2.91	60.2	84.2
Ana-0670-090	47 ST	1628	1868	54 AVE	55 AVE	240	COL	30.3	54.9	85.2	4.2	4	3.82	16.6	59.3
Ana-0670-100	47 ST	1868	1891	55 AVE		23	COL	9.4	13.3	22.8	0.0	3	3.51	46.7	71.5
Ana-0680-010	47A AVE	0	274	61 ST	MOUNT PLEASANT DR	274	LOC	2.1	8.1	10.2	0.1	2	3.44	79.3	89.8
Ana-0680-020	47A AVE	275	641	MOUNT PLEASANT DR	56 ST	366	LOC	9.2	12.9	22.1	0.4	2	3.87	54.7	76.3
Ana-0690-010	48 AVE	0	914	West End	RGE RD 204 / RGE RD 205	914	ART	0.0	1.0	1.0	0.0	2	0.85	98.2	99.0
Ana-0690-020	48 AVE	914	1955	RGE RD 204 / RGE RD 205	73 ST	1041	ART	0.5	0.9	1.5	0.0	3	1.16	94.1	98.5
Ana-0690-030	48 AVE	1955	2420	73 ST	68 ST SB	465	ART	10.2	20.0	30.2	0.9	9	2.39	30.9	72.1
Ana-0690-040	48 AVE	2420	2801	68 ST SB	65 ST	381	ART	7.2	26.3	33.5	0.1	12	3.20	37.8	74.8
Ana-0690-050	48 AVE	2801	3244	65 ST	COMP RD	443	ART	13.5	10.2	23.6	2.1	11	2.55	26.2	71.3
Ana-0690-060	48 AVE	3244	3287	COMP RD	S 48TH AVE SERVICE RD	43	ART	31.9	26.2	58.0	9.6	9	4.37	3.3	61.3
Ana-0690-070	48 AVE	3287	3359	S 48TH AVE SERVICE RD	GRAND PARK CRES	72	ART	36.7	15.5	52.3	3.8	8	2.91	9.9	53.1
Ana-0690-080	48 AVE	3359	3557	GRAND PARK CRES	S 48TH AVE SERVICE RD	198	ART	29.0	15.9	44.9	2.2	12	4.29	6.8	57.3
Ana-0690-090	48 AVE	3557	3587	S 48TH AVE SERVICE RD	MOUNT PLEASANT DR	30	ART	0.0	2.9	2.9	0.0	9	5.25	58.6	75.0
Ana-0690-100	48 AVE	3587	3673	MOUNT PLEASANT DR	58 ST	86	ART	7.9	7.0	14.9	0.5	9	4.94	44.1	71.8
Ana-0690-110	48 AVE	3673	3915	58 ST	S 48TH AVE SERVICE RD	242	ART	15.3	10.6	25.9	1.1	11	3.09	23.9	71.2
Ana-0690-120	48 AVE	3915	4058	S 48TH AVE SERVICE RD	55 ST	143	ART	8.8	10.5	19.3	2.4	9	3.59	29.5	70.9
Ana-0690-130	48 AVE	4058	4157	55 ST	54 ST	99	ART	0.7	2.3	3.0	2.7	9	3.17	44.6	96.5
Ana-0690-140	48 AVE	4157	4257	54 ST	53 ST	100	ART	1.0	0.7	1.7	0.7	11	3.85	46.6	74.4
Ana-0690-150	48 AVE	4257	4599	53 ST	50 ST_SB	342	ART	0.1	1.1	1.2	0.2	4	3.67	89.8	75.0
Ana-0690-160	48 AVE	4599	4723	50 ST_SB	49 ST	124	ART	1.0	3.7	4.7	0.0	5	3.08	83.2	95.1
Ana-0690-170	48 AVE	4723	4822	49 ST	48 ST	99	ART	4.9	11.2	16.1	0.1	7	3.29	48.3	82.7
Ana-0690-180	48 AVE	4822	5325	48 ST	44 ST	503	ART	7.6	20.0	27.6	1.6	10	2.80	30.8	71.8
Ana-0690-220	48 AVE	5325	5680	44 ST	41 ST	355	ART	17.9	25.2	43.1	2.1	11	3.31	26.7	71.3
Ana-0690-230	48 AVE	5680	5909	41 ST		229	ART	5.5	4.7	10.2	0.8	20	2.95	28.7	71.8
Ana-0690-235	48 AVE	5909	6363		S 48TH AVE SERVICE RD	454	ART	0.8	2.9	3.7	4.3	7	2.40	50.9	96.0
Ana-0690-240	48 AVE	6363	6874	S 48TH AVE SERVICE RD	36 ST	511	ART	23.1	2.1	25.2	0.8	5	2.15	53.4	74.9
Ana-0690-250	48 AVE	6874	6973	36 ST	NO NAME	99	ART	26.9	6.1	32.9	0.0	4	2.10	52.4	74.7
Ana-0690-260	48 AVE	6973	7069	NO NAME	EAST END 1	96	ART	27.6	2.9	30.5	0.0	5	2.14	49.0	74.7
Ana-0690-270	48 AVE	7069	7260	EAST END 1	EAST END 2	191	ART	27.0	1.3	28.3	0.0	5	2.05	51.5	74.8
Ana-0690-280	48 AVE	7260	7451	EAST END 2	EAST END 3	191	ART	26.6	0.2	26.8	0.0	4	2.34	55.5	75.0
Ana-0690-290	48 AVE	7451	7710	EAST END 3	EXHIBITION DR / HIGHWAY 13	259	ART	24.6	1.5	26.1	0.0	4	2.18	52.0	74.7
Ana-0700-010	48 AVE WB	1	464	73 ST	68 ST SB	463	ART	9.8	8.1	18.0	0.3	15	2.29	30.4	71.6
Ana-0700-020	48 AVE WB	464	696	68 ST SB	66 ST	232	ART	5.5	8.3	13.8	0.3	14	3.56	37.1	72.8
Ana-0700-030	48 AVE WB	696	1170	66 ST	GRAND DR	474	ART	7.6	6.9	14.5	1.5	10	3.98	34.4	71.4
Ana-0700-040	48 AVE WB	1170	1289	GRAND DR	COMP RD	119	ART	52.2	19.8	72.0	12.5	14	3.64	8.3	41.4

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0700-050	48 AVE WB	1289	1404	COMP RD	GRAND PARK CRES	115	ART	43.4	14.0	57.4	10.3	12	3.60	5.0	47.0
Ana-0700-060	48 AVE WB	1404	1632	GRAND PARK CRES	MOUNT PLEASANT DR	228	ART	21.9	15.2	37.1	3.4	13	3.52	11.5	63.4
Ana-0700-070	48 AVE WB	1632	1718	MOUNT PLEASANT DR	58 ST	86	ART	9.2	12.3	21.5	2.7	10	4.50	25.4	71.8
Ana-0700-080	48 AVE WB	1718	1985	58 ST	56 ST	267	ART	9.8	5.9	15.7	1.5	12	2.70	28.3	81.1
Ana-0700-090	48 AVE WB	1985	2302	56 ST	53 ST	317	ART	0.9	1.4	2.3	0.1	9	2.47	51.6	97.1
Ana-0700-100	48 AVE WB	2302	2546	53 ST	51 ST	244	ART	0.1	0.4	0.5	0.0	2	2.59	96.6	99.4
Ana-0700-110	48 AVE WB	2546	2644	51 ST	50 ST_SB	98	ART	0.0	0.7	0.7	0.0	4	4.61	99.4	75.0
Ana-0700-120	48 AVE WB	2644	2858	50 ST_SB	48 ST	214	ART	9.7	16.2	25.9	1.7	9	3.60	40.3	71.9
Ana-0700-140	48 AVE WB	2858	2971	48 ST	47 ST	113	ART	6.3	8.4	14.7	1.3	10	4.39	49.2	73.2
Ana-0700-150	48 AVE WB	2971	3138	47 ST	46 ST	167	ART	13.3	11.8	25.1	2.0	10	3.97	27.5	69.8
Ana-0700-160	48 AVE WB	3138	3725	46 ST	41 ST	587	ART	7.6	6.0	13.6	3.3	11	3.42	30.2	84.2
Ana-0700-170	48 AVE WB	3725	3957	41 ST	39 ST_SB	232	ART	1.2	1.9	3.1	0.6	24	3.63	22.5	74.4
Ana-0700-180	48 AVE WB	3957	4419	39 ST_SB	HIGHWAY 26	462	ART	0.4	2.2	2.6	2.3	6	2.36	70.9	97.3
Ana-0700-190	48 AVE WB	4419	5759	HIGHWAY 26	RGE RD 201	1340	ART	8.1	11.8	19.9	0.0	3	2.23	66.3	80.1
Ana-0700-200	48 AVE WB	5759	6258	RGE RD 201	HIGHWAY 13	499	ART	12.0	11.0	23.0	1.4	4	1.92	42.1	73.1
Ana-0710-010	48 ST	0	187	South End	46 AVE	187	LOC	12.6	29.2	41.8	0.8	5	4.73	45.4	74.2
Ana-0710-020	48 ST	188	391	46 AVE	47 AVE	203	LOC	11.7	27.6	39.3	2.0	2	5.53	38.1	72.5
Ana-0710-030	48 ST	391	590	47 AVE	48 AVE	199	COL	4.6	35.1	39.7	0.6	2	4.52	52.1	73.3
Ana-0710-040	48 ST	591	682	48 AVE WB	48A AVE	91	COL	0.0	0.5	0.5	0.0	2	3.14	99.6	99.5
Ana-0710-050	48 ST	682	854	48A AVE	49 AVE	172	COL	0.0	0.5	0.5	0.0	1	1.56	99.2	99.5
Ana-0710-060	48 ST	854	1027	49 AVE	50 AVE	173	COL	0.1	5.2	5.3	0.8	3	2.91	85.2	94.7
Ana-0710-070	48 ST	1027	1199	50 AVE	51 AVE	172	COL	3.5	7.5	11.0	0.8	4	3.02	53.4	86.9
Ana-0710-080	48 ST	1199	1348	51 AVE	47 ST / 52 AVE	149	COL	5.2	16.0	21.1	4.0	4	4.09	38.4	72.6
Ana-0710-090	48 ST	1349	1607	52 AVE	53 AVE	258	LOC	4.1	10.7	14.8	1.5	2	5.69	70.6	85.0
Ana-0710-100	48 ST	1608	1647	54 AVE	NO NAME	39	LOC	4.7	5.6	10.2	0.9	4		54.8	88.2
Ana-0720-010	48A AVE	0	43	West End	64 ST	43	LOC	5.8	12.3	18.2	21.8	9		32.1	79.4
Ana-0720-020	48A AVE	43	268	64 ST	GRAND DR / GRANDVIEW CRES	225	LOC	9.0	10.5	19.5	2.4	5	8.26	54.8	76.7
Ana-0720-030	48A AVE	269	465	60 ST	58 ST	196	LOC	8.7	17.6	26.3	4.2	2	3.24	42.6	73.0
Ana-0720-040	48A AVE	466	556	West End	54 ST	90	LOC	3.8	15.0	18.8	2.5	2	3.04	66.6	81.2
Ana-0720-050	48A AVE	556	667	54 ST	53A ST	111	LOC	2.0	17.3	19.3	6.8	2	2.92	63.6	80.7
Ana-0720-060	48A AVE	667	728	53A ST	53 ST	61	LOC	4.0	17.8	21.8	2.7	2	4.39	65.8	78.0
Ana-0720-070	48A AVE	729	769	53 ST	52A ST	40	ART	12.8	9.8	22.6	2.8	3	3.85	35.0	68.3
Ana-0720-080	48A AVE	769	869	52A ST	52 ST	100	ART	17.5	15.9	33.4	3.3	3	3.62	34.4	69.1
Ana-0720-090	48A AVE	869	968	52 ST	51 ST	99	ART	12.5	14.1	26.6	2.6	3	2.94	40.0	72.2
Ana-0720-100	48A AVE	968	1072	51 ST	50 ST	104	COL	11.6	24.9	36.5	0.5	3	3.42	37.9	72.0
Ana-0720-110	48A AVE	1072	1177	50 ST	49 ST	105	LOC	0.6	1.4	1.9	0.3	2	3.29	86.3	97.9
Ana-0720-120	48A AVE	1177	1276	49 ST	48 ST	99	LOC	6.7	12.3	18.9	0.6	2	2.39	50.8	78.1
Ana-0730-010	48B AVE	0	225	64 ST	GRAND DR / GRANDVIEW CRES	225	LOC	4.8	9.8	14.7	0.8	6	8.30	62.7	83.6
Ana-0730-020	48B AVE	226	373	GRAND PARK CRES	60 ST	147	LOC	1.4	2.0	3.4	0.0	2		86.6	96.5
Ana-0730-030	48B AVE	373	574	60 ST	58 ST	201	LOC	10.3	14.6	24.9	3.0	2	4.78	43.4	72.5
Ana-0730-040	48B AVE	574	744	58 ST	East End	170	LOC	0.2	4.0	4.1	0.0	2	3.72	93.9	95.9
Ana-0740-010	49 AVE	0	248	66 ST	64 ST	248	LOC	1.9	5.5	7.3	2.0	3	7.18	69.9	92.2
Ana-0740-020	49 AVE	249	479	64 ST	GRAND DR	230	LOC	7.5	21.6	29.1	2.8	4	8.72	35.3	71.7
Ana-0740-030	49 AVE	480	576	58 ST	57 ST	96	LOC	2.0	9.1	11.1	1.6	2	1.96	76.2	88.9
Ana-0740-040	49 AVE	576	749	57 ST	56 ST	173	LOC	6.9	18.3	25.3	3.5	2	3.59	55.9	74.6
Ana-0740-050	49 AVE	749	921	56 ST	54 ST	172	LOC	7.0	23.1	30.2	3.9	2	4.73	54.6	74.8
Ana-0740-060	49 AVE	921	1094	54 ST	53 ST	173	LOC	7.4	21.4	28.8	12.1	3	5.58	47.3	74.9
Ana-0740-070	49 AVE	1094	1161	53 ST	52A ST	67	LOC	0.4	2.7	3.1	0.0	2	5.23	87.6	96.7
Ana-0740-080	49 AVE	1161	1260	52A ST	52 ST	99	LOC	0.0	2.2	2.2	0.0	2	4.60	96.7	97.8
Ana-0740-090	49 AVE	1260	1360	52 ST	51 ST	100	LOC	1.4	3.7	5.1	0.3	3	2.91	82.2	94.7
Ana-0740-100	49 AVE	1360	1464	51 ST	50 ST	104	COL	4.1	8.2	12.3	0.7	3		58.4	86.0
Ana-0740-110	49 AVE	1464	1569	50 ST	49 ST	105	COL	4.8	11.5	16.3	0.9	3	2.37	61.2	82.6
Ana-0740-120	49 AVE	1569	1668	49 ST	48 ST	99	COL	3.5	20.5	24.0	0.9	2	3.70	62.4	73.9
Ana-0740-130	49 AVE	1668	1780	48 ST	47 ST	112	LOC	4.9	8.6	13.5	0.0	3	4.30	69.3	86.1
Ana-0740-140	49 AVE	1780	1910	47 ST	46 ST	130	LOC	1.8	8.2	10.0	0.0	2	3.23	79.8	90.0
Ana-0740-150	49 AVE	1911	2019	46 ST	45 ST	108	LOC	0.3	19.8	20.1	19.7	5	5.39	59.1	79.9
Ana-0740-160	49 AVE	2019	2143	45 ST	44 ST	124	LOC	4.1	19.1	23.3	11.9	4	2.00	48.3	76.7
Ana-0740-170	49 AVE	2143	2183	44 ST	43 ST	40	LOC	1.5	23.5	25.1	22.1	2	4.45	54.3	75.0
Ana-0740-180	49 AVE	2183	2242	43 ST	43 ST	59	LOC	18.2	36.0	54.2	15.1	3	5.96	33.3	70.0
Ana-0740-190	49 AVE	2242	2346	43 ST	42 ST	104	LOC	14.9	30.9	45.8	14.1	4	4.41	36.0	70.3
Ana-0750-010	49 ST	290	492	46 AVE	47 AVE	202	LOC	10.7	38.8	49.5	3.5	4	5.57	34.8	72.9
Ana-0750-020	49 ST	492	691	47 AVE	48 AVE	199	LOC	5.2	39.5	44.7	6.8	4	5.82	46.9	74.3
Ana-0750-030	49 ST	692	798	48 AVE WB	48A AVE	106	LOC	3.3	3.9	7.2	0.9	2	3.43	62.8	91.5
Ana-0750-040	49 ST	798	971	48A AVE	49 AVE	173	LOC	6.3	8.5	14.9	0.3	2	3.21	58.5	84.0
Ana-0750-050	49 ST	971	1143	49 AVE	50 AVE	172	LOC	6.9	13.7	20.6	2.8	5	5.39	47.5	77.5
Ana-0750-060	49 ST	1143	1315	50 AVE	51 AVE	172	LOC	4.6	10.0	14.7	5.5	4	5.13	48.8	83.8
Ana-0750-070	49 ST	1316	1556	52 AVE	53 AVE	240	LOC	6.1	15.1	21.3	0.2	3	4.79	63.6	78.7
Ana-0750-080	49 ST	1557	1613	South End	55 AVE	56	LOC	2.9	3.8	6.7	0.0	2		66.0	92.3
Ana-0760-010	49A AVE	0	135	71 ST	69 ST	135	LOC	0.0	2.6	2.6	0.0	2	4.54	96.5	97.4
Ana-0770-010	50 AVE	0	124	71 ST	70 ST	124	COL	0.1	0.4	0.5	0.0	1	2.09	95.9	99.5
Ana-0770-020	50 AVE	124	191	70 ST	69 ST	67	COL	0.1	0.8	0.9	0.0	1	2.27	92.4	99.0
Ana-0770-030	50 AVE	191	336	69 ST	NO NAME	145	COL	0.0	0.8	0.8	0.2	1	1.95	97.1	99.2
Ana-0770-040	50 AVE	336	423	NO NAME	68 ST SB	87	COL	0.0	0.2	0.2	0.0	2	1.64	99.3	99.8
Ana-0770-050	50 AVE	423	560	68 ST SB	66 ST	137	COL	5.0	8.5	13.5	0.0	2	4.31	72.7	73.8
Ana-0770-060	50 AVE	560	615	66 ST	65A ST	55	LOC	3.4	14.9	18.3	1.0	4		56.9	80.7
Ana-0770-070	50 AVE	615	715	65A ST	65 ST	100	LOC	9.5	11.9	21.4	4.8	6		38.4	74.7
Ana-0770-080	50 AVE	715	805	65 ST	64 ST	90	LOC	2.4	5.9	8.3	1.7	6		67.2	90.8
Ana-0770-090	50 AVE	806	905	58 ST / GRAND DR	57 ST	99	COL	2.7	1.3	4.0	0.6	2	2.02	61.6	94.2
Ana-0770-100	50 AVE	905	1077	57 ST	56 ST	172	COL	3.1	3.2	6.3	0.7	2	2.25	69.1	92.1
Ana-0770-110	50 AVE	1077	1250	56 ST	54 ST	173	COL	1.0	3.0	4.0	0.5	2	2.28	84.9	95.8
Ana-0770-120	50 AVE	1250	1422	54 ST	53 ST	172	COL	2.1	2.9	5.0	0.2	1	2.44	74.3	94.3
Ana-0770-130	50 AVE	1422	1514	53 ST	52A ST	92	COL	1.2	1.1	2.3	0.2	3	3.45	78.0	97.0
Ana-0770-140	50 AVE	1514	1614	52A ST	52 ST	100	COL	0.6	0.1	0.7	0.0	3	2.37	90.0	98.9
Ana-0770-150	50 AVE	1614	1713	52 ST	51 ST	99	COL	1.3	1.9	3.2	0.4	2	2.96	90.0	96.1
Ana-0770-160	50 AVE	1713	1817	51 ST	50 ST	104	COL	6.9	12.7	19.6	4.6	6	3.85	35.3	72.2
Ana-0770-170	50 AVE	1817	1922	50 ST	49 ST	105	COL	12.6	14.3	26.9	6.1	6	3.98	27.3	71.0
Ana-0770-180	50 AVE	1922	2021	49 ST	48 ST	99	COL	7.0	10.2	17.2	5.0	3	3.86	53.2	72.7
Ana-0770-190	50 AVE	2021	2133	48 ST	47 ST	112	COL	0.0	0.3	0.3	0.0	2	3.06	99.4	99.7
Ana-0770-200	50 AVE	2133	2253	47 ST	46 ST	120	COL	4.0	5.9	10.0	5.0	4	3.83	61.9	73.7
Ana-0770-210	50 AVE	2254	2362	46 ST	45 ST	108	LOC	7.8	19.0	26.8	0.8	2	4.00	41.6	73.3
Ana-0770-220	50 AVE	2362	2486	45 ST	44 ST	124	LOC	8.2	26.3	34.4	0.4	2	4.25	55.8	74.4
Ana-0770-230	50 AVE	2486	2585	44 ST	43 ST	99	LOC	8.0	25.8	33.8	1.3	3	3.98	47.2	74.4
Ana-0770-240	50 AVE	2585	2684	43 ST	42 ST	99	LOC	4.6	18.0	22.6	0.6	1	3.86	61.2	76.9
Ana-0770-250	50 AVE	2684	2800	42 ST	East End	116	LOC	4.0	23.7	27.7	0.2	4	5.85	62.5	74.8
Ana-0780-010	50 ST	2738	2894	CAMROSE DR / NO NAME	34 AVE_EB	156	COL	0.2	0.9	1.1	0.5	2	3.37	91.8	98.8
Ana-0780-020	50 ST	2894	3272	34 AVE_EB	WT BUILDING RD ACCESS	378	COL	0.2	0.5	0.7	0.0	3	2.42	96.8	99.3
Ana-0780-030	50 ST	3272	3533	WT BUILDING RD ACCESS	49 ST	261	COL	0.4	1.8	2.2	0.2	3	1.84	79.8	97.8
Ana-0780-040	50 ST	3533	3925	49 ST	AUGUSTANA DORMES	392	COL	0.1	0.5	0.7	0.1	4	2.10	84.9	99.2
Ana-0780-050	50 ST	3925	4110	AUGUSTANA DORMES	44 AVE	185	COL	0.1	1.2	1.3	0.0	3	2.25	98.5	98.7
Ana-0780-060	50 ST	4110	4524	44 AVE	46 AVE	414	COL	0.0	0.8	0.8	0.0	4	2.24	98.8	99.2
Ana-0780-070	50 ST	4525	4728	46 AVE	47 AVE	203	COL	0.0	0.5	0.5	0.2	4	2.78	97.7	99.5
Ana-0780-080	50 ST	4728	4927	47 AVE	48 AVE	199	COL	0.0	2.4	2.4	0.0	3	3.16	92.8	97.6
Ana-0780-090	50 ST	4928	5049	48 AVE WB	48A AVE	121	COL	0.7	0.5	1.2	0.0	3	5.09	89.1	74.6
Ana-0780-100	50 ST	5050	5222	48A AVE	49 AVE	172	COL	0.1	3.8	3.9	0.0	4	3.38	94.3	96.1
Ana-0780-110	50 ST	5222	5394	49 AVE	50 AVE	172	COL	0.1	7.8	7.9	0.0	4	1.92	89.7	92.1
Ana-0780-120	50 ST	5394	5566	50 AVE	51 AVE	172	COL	0.0	6.0	6.0	0.2	2	3.98	90.7	75.0
Ana-0780-130	50 ST	5568	5780	52 AVE	53 AVE	212	LOC	4.9	11.7	16.6	0.4	2	7.41	69.4	82.4

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0780-140	50 ST	5780	5984	53 AVE	54 AVE	204	LOC	0.8	2.1	2.9	0.4	2	3.24	89.9	96.9
Ana-0780-150	50 ST	5984	6141	54 AVE	54A AVE	157	LOC	1.2	1.4	2.6	0.7	1	4.75	88.8	96.9
Ana-0780-160	50 ST	6141	6257	54A AVE	55 AVE	116	LOC	0.0	0.0	0.0	0.0	1	3.10	100	100.0
Ana-0790-010	50 ST_SB	0	203	South End	47 AVE	203	COL	0.0	0.2	0.2	0.0	3	2.94	99.7	99.8
Ana-0790-020	50 ST_SB	203	402	47 AVE	48 AVE	199	COL	7.7	6.6	14.4	0.7	5	3.05	40.7	82.8
Ana-0790-030	50 ST_SB	403	527	48 AVE WB	48A AVE	124	COL	3.9	8.4	12.4	2.3	3	3.61	49.9	73.7
Ana-0800-010	500 PARKRIDGE CL	0	53	Southwest End	PARKRIDGE DR	53	LOC	1.3	9.9	11.2	0.0	2		80.4	88.8
Ana-0810-010	50A AVE	0	94	65A ST	65 ST	94	LOC	7.2	13.9	21.0	0.9	7		55.2	78.2
Ana-0810-020	50A AVE	95	158	57 ST	East End	63	LOC	5.3	15.2	20.5	3.4	2		60.5	79.5
Ana-0820-010	50A ST CL	0	67	34 AVE / NO NAME	North End	67	LOC	4.9	15.5	20.4	0.0	1		70.2	79.6
Ana-0830-010	50B ST CL	0	84	34 AVE / NO NAME	North End	84	LOC	2.5	17.9	20.4	0.0	2		71.6	79.6
Ana-0840-020	51 AVE	124	223	58 ST	57 ST	99	LOC	4.6	15.9	20.4	11.4	3	3.52	44.1	79.0
Ana-0840-030	51 AVE	223	396	57 ST	56 ST	173	LOC	2.4	12.2	14.6	2.1	2	4.27	71.6	85.4
Ana-0840-040	51 AVE	396	568	56 ST	54 ST	172	LOC	1.3	12.4	13.7	0.4	2	6.46	78.9	86.3
Ana-0840-050	51 AVE	568	741	54 ST	53 ST	173	LOC	2.6	9.4	12.0	0.7	2	3.48	74.8	87.8
Ana-0840-060	51 AVE	741	860	53 ST	52A ST	119	COL	4.4	10.9	15.3	1.6	5	4.65	58.8	73.6
Ana-0840-070	51 AVE	860	960	52A ST	52 ST	100	COL	7.1	15.6	22.6	4.2	8	10.35	23.9	71.3
Ana-0840-080	51 AVE	960	1059	52 ST	51 ST	99	COL	6.4	11.5	17.9	4.2	8	4.61	30.5	72.2
Ana-0840-090	51 AVE	1059	1164	51 ST	50 ST	105	COL	11.2	10.3	21.5	8.3	6	4.86	23.4	70.9
Ana-0840-100	51 AVE	1164	1268	50 ST	49 ST	104	COL	10.3	8.8	19.1	8.6	5	5.24	19.9	71.1
Ana-0840-110	51 AVE	1268	1367	49 ST	48 ST	99	COL	7.6	7.7	15.3	6.4	9	5.25	28.9	72.1
Ana-0840-120	51 AVE	1367	1479	48 ST	47 ST	112	COL	3.5	4.5	7.9	0.7	6	2.76	54.7	90.7
Ana-0840-130	51 AVE	1479	1623	47 ST	46 ST	144	COL	4.6	7.1	11.7	0.4	3	2.55	68.0	87.7
Ana-0840-140	51 AVE	1623	2299	46 ST	41 ST	676	COL	6.6	5.0	11.7	2.6	8	3.95	36.7	71.9
Ana-0840-150	51 AVE	2299	2449	41 ST	39 ST_SB	150	COL	1.2	2.5	3.7	0.6	10	5.46	52.5	74.7
Ana-0850-010	51 ST	0	212	34 AVE / 51 ST CL	36 AVE	212	LOC	7.3	16.7	24.1	0.0	2	7.04	64.4	75.7
Ana-0850-020	51 ST	213	391	47 AVE	North End	178	LOC	8.0	11.1	19.1	1.7	2	5.16	61.2	77.7
Ana-0850-030	51 ST	392	531	48 AVE WB	48A AVE	139	ART	7.3	38.2	45.5	1.4	7	3.38	20.7	71.5
Ana-0850-040	51 ST	531	703	48A AVE	49 AVE	172	COL	6.0	20.2	26.2	1.8	6	3.13	38.8	72.9
Ana-0850-050	51 ST	703	876	49 AVE	50 AVE	173	COL	7.3	22.9	30.1	2.7	5	5.71	36.2	72.0
Ana-0850-060	51 ST	876	1047	50 AVE	51 AVE	171	COL	7.0	10.1	17.1	1.0	4	3.55	52.8	72.8
Ana-0850-070	51 ST	1048	1240	52 AVE	53 AVE	192	LOC	8.2	16.3	24.5	0.2	2	5.70	64.4	75.4
Ana-0850-080	51 ST	1240	1442	53 AVE	54 AVE	202	LOC	9.7	17.8	27.5	0.7	2	4.23	57.9	74.3
Ana-0850-090	51 ST	1442	1724	54 AVE	55 AVE	282	LOC	6.2	11.7	17.9	1.0	4	7.77	55.1	80.9
Ana-0860-010	51 ST CL	0	142	South End	34 AVE / 51 ST	142	LOC	1.6	18.4	20.0	0.0	1	3.30	75.5	80.0
Ana-0870-010	51A ST	0	217	South End	47 AVE	217	LOC	4.5	8.1	12.6	0.0	7	5.64	60.3	85.6
Ana-0880-010	52 AVE	0	118	56 ST	55 ST	118	COL	0.0	0.6	0.6	0.0	4	2.91	97.1	99.4
Ana-0880-020	52 AVE	118	237	55 ST	54 ST	119	COL	0.1	0.9	1.0	0.2	2	2.53	91.6	99.0
Ana-0880-030	52 AVE	237	354	54 ST	53 ST	117	COL	0.0	1.1	1.1	0.2	2	2.68	96.3	98.9
Ana-0880-040	52 AVE	355	512	53 ST	52 ST	157	COL	1.8	12.8	14.6	0.2	3	2.65	77.4	85.4
Ana-0880-050	52 AVE	512	610	52 ST	51 ST	98	COL	2.4	12.7	15.1	0.0	2	2.92	76.3	84.9
Ana-0880-060	52 AVE	610	720	51 ST	50 ST	110	COL	5.0	14.2	19.3	0.3	3	2.27	68.7	80.7
Ana-0880-070	52 AVE	721	845	50 ST	49 ST	124	COL	5.6	10.8	16.4	0.0	1	3.83	71.8	73.3
Ana-0880-080	52 AVE	845	961	49 ST	48 ST	116	COL	0.4	3.6	4.0	0.2	2	2.36	90.0	96.0
Ana-0880-090	52 AVE	961	1045	48 ST	47 ST / 48 ST	84	COL	3.4	3.6	7.0	1.4	3	3.85	70.9	73.5
Ana-0880-100	52 AVE	1045	1196	47 ST / 48 ST	46 ST	151	COL	4.0	5.1	9.2	1.0	2	4.75	65.1	73.3
Ana-0880-110	52 AVE	1196	1312	46 ST	45 ST / 52A AVE	116	COL	0.2	1.1	1.4	0.0	3	4.07	95.9	74.9
Ana-0890-010	52 ST	0	84	33 AVE	33A AVE	84	LOC	3.9	20.8	24.7	0.0	3	7.51	69.2	75.3
Ana-0890-020	52 ST	84	169	33A AVE	34 AVE	85	LOC	1.7	20.9	22.6	0.0	2	6.18	75.3	77.2
Ana-0890-030	52 ST	169	260	34 AVE	35 AVE	91	LOC	1.4	35.2	36.6	0.0	1	4.59	67.1	74.6
Ana-0890-040	52 ST	260	364	35 AVE	36 AVE	104	LOC	5.4	25.2	30.6	0.0	2	5.44	60.2	74.5
Ana-0890-050	52 ST	365	599	North End	43 AVE	234	LOC	7.7	20.7	28.5	1.6	3	4.63	57.5	74.1
Ana-0890-060	52 ST	599	739	43 AVE	44 AVE	140	LOC	6.0	42.8	48.8	27.5	3	3.53	26.4	73.0
Ana-0890-070	52 ST	740	894	44 AVE	52A ST	154	LOC	2.9	10.3	13.2	0.0	1	2.71	74.5	86.5
Ana-0890-080	52 ST	894	1161	52A ST	46 AVE	267	LOC	7.4	42.7	50.1	0.1	2	3.04	57.7	74.7
Ana-0890-090	52 ST	1161	1383	46 AVE	47 AVE	222	LOC	9.0	22.4	31.4	0.1	2	2.73	57.2	74.0
Ana-0890-100	52 ST	1384	1524	South End	48A AVE	140	LOC	6.5	8.2	14.7	4.6	3	5.12	51.6	82.9
Ana-0890-110	52 ST	1524	1696	48A AVE	49 AVE	172	LOC	10.0	22.5	32.5	11.5	2	3.50	39.6	73.6
Ana-0890-120	52 ST	1696	1868	49 AVE	50 AVE	172	LOC	3.6	13.2	16.7	4.2	2	4.04	60.1	83.2
Ana-0890-130	52 ST	1868	2040	50 AVE	51 AVE	172	LOC	7.5	17.0	24.5	11.6	5	6.70	38.0	72.6
Ana-0890-140	52 ST	2041	2231	52 AVE	53 AVE	190	LOC	5.7	14.4	20.0	0.8	2	5.49	55.2	78.8
Ana-0890-150	52 ST	2231	2334	53 AVE	53A AVE	103	LOC	1.0	2.6	3.6	0.2	2	3.78	83.1	96.1
Ana-0890-160	52 ST	2334	2434	53A AVE	54 AVE	100	LOC	1.4	5.0	6.4	0.4	2	6.58	76.4	93.3
Ana-0890-170	52 ST	2434	2639	54 AVE	North End	205	LOC	7.4	23.5	30.9	1.3	5	8.55	38.7	72.5
Ana-0900-010	52A AVE	0	118	45 ST / 52 AVE	44 ST	118	LOC	0.0	0.7	0.7	0.0	1	4.99	99.1	99.3
Ana-0900-020	52A AVE	118	236	44 ST	43 ST	118	LOC	0.0	0.7	0.7	0.0	2	3.62	99.2	99.3
Ana-0900-030	52A AVE	236	353	43 ST	42 ST	117	LOC	0.0	0.9	0.9	0.0	2	2.43	98.7	99.1
Ana-0900-040	52A AVE	353	476	42 ST	41 ST	123	LOC	0.0	0.4	0.4	0.2	2	3.79	96.7	99.6
Ana-0910-010	52A ST	0	79	35 AVE	36 AVE	79	LOC	5.1	11.9	17.0	0.4	1		70.9	83.0
Ana-0910-020	52A ST	80	192	44 AVE	44A AVE	112	LOC	7.5	13.6	21.2	0.7	2	3.91	54.7	77.2
Ana-0910-030	52A ST	193	288	52 ST	45 AVE	95	LOC	12.7	9.4	22.1	2.4	2		34.1	73.5
Ana-0910-040	52A ST	288	348	45 AVE	45A AVE	60	LOC	10.4	14.0	24.4	3.3	2	6.90	49.3	72.7
Ana-0910-050	52A ST	349	521	48A AVE	49 AVE	172	LOC	9.8	17.3	27.1	2.1	2	3.69	50.3	74.4
Ana-0910-060	52A ST	521	693	49 AVE	50 AVE	172	LOC	3.9	9.4	13.3	0.2	1	5.47	69.2	86.3
Ana-0910-070	52A ST	693	865	50 AVE	51 AVE	172	LOC	11.1	16.3	27.4	0.8	3	4.60	52.8	73.7
Ana-0920-010	52B AVE	0	112	46 ST	45 ST	112	LOC	3.7	4.1	7.8	0.3	2	2.66	66.9	90.9
Ana-0920-020	52B AVE	112	230	45 ST	44 ST	118	LOC	3.2	6.6	9.7	0.0	2	2.76	72.5	89.8
Ana-0920-030	52B AVE	230	347	44 ST	43 ST	117	LOC	2.9	3.2	6.1	0.0	3	2.97	78.4	93.2
Ana-0920-040	52B AVE	347	465	43 ST	42 ST	118	LOC	0.9	1.0	1.9	0.0	4	2.68	89.6	98.0
Ana-0920-050	52B AVE	465	582	42 ST	41 ST	117	LOC	1.1	1.6	2.7	0.0	3	3.48	87.5	97.3
Ana-0930-010	52B ST	0	151	33A AVE	36 AVE	151	LOC	5.7	12.3	17.9	0.2	2	3.12	70.6	82.1
Ana-0940-010	53 AVE	0	243	67 ST	66 ST	243	LOC	8.3	12.3	20.7	0.2	2	3.41	68.9	79.3
Ana-0940-020	53 AVE	244	421	64 ST	62 ST	177	LOC	8.6	21.0	29.6	0.2	3	5.93	57.1	74.6
Ana-0940-030	53 AVE	422	478	West End	58 ST	56	LOC	6.6	17.7	24.3	2.8	2	5.37	39.8	72.9
Ana-0940-040	53 AVE	478	583	58 ST	57 ST	105	LOC	10.8	16.5	27.3	1.1	2	4.28	38.6	70.1
Ana-0940-050	53 AVE	583	701	57 ST	56 ST	118	LOC	3.5	23.9	27.3	1.9	2	3.11	52.3	74.1
Ana-0940-060	53 AVE	701	818	56 ST	55 ST	117	LOC	1.4	5.7	7.0	0.1	2	3.25	81.7	92.9
Ana-0940-070	53 AVE	818	936	55 ST	54 ST	118	LOC	1.3	2.7	4.0	0.0	1	2.52	89.1	96.0
Ana-0940-080	53 AVE	936	1054	54 ST	53 ST	118	LOC	1.7	3.3	5.1	0.0	2	2.23	80.4	94.6
Ana-0940-090	53 AVE	1054	1208	53 ST	52 ST	154	LOC	4.5	11.3	15.8	18.6	3	4.38	51.3	83.0
Ana-0940-100	53 AVE	1208	1307	52 ST	51 ST	99	LOC	7.7	24.5	32.1	24.3	4	4.71	37.5	73.8
Ana-0940-110	53 AVE	1307	1407	51 ST	50 ST	100	LOC	9.8	17.7	27.5	28.7	5	5.57	29.6	71.8
Ana-0940-120	53 AVE	1407	1525	50 ST	49 ST	118	LOC	11.4	20.7	32.1	29.0	5	4.43	29.8	71.1
Ana-0940-130	53 AVE	1525	1640	49 ST	48 ST	115	LOC	10.0	18.7	28.8	28.8	5	4.07	28.8	71.2
Ana-0940-140	53 AVE	1640	1755	48 ST	47 ST	115	LOC	13.1	23.6	36.7	23.9	4	5.47	26.6	71.1
Ana-0940-150	53 AVE	1755	1872	47 ST	46 ST	117	LOC	1.4	3.5	4.9	1.8	2	5.96	88.2	94.6
Ana-0950-010	53 ST	1	330	PARKVIEW DR	43 AVE	329	ART	0.0	0.4	0.4	0.6	2	2.15	93.6	99.6
Ana-0950-020	53 ST	331	534	43 AVE	44 AVE	203	ART	0.0	2.6	2.6	0.0	3	2.59	92.9	82.4
Ana-0950-030	53 ST	534	644	44 AVE	44A AVE	110	ART	3.1	3.9	7.1	1.2	5	3.33	59.2	76.0
Ana-0950-040	53 ST	644	811	44A AVE	45A AVE	167	ART	0.8	0.3	1.1	0.4	14	3.14	45.8	74.5
Ana-0950-050	53 ST	811	950	45A AVE	46 AVE	139	ART	0.4	0.7	1.1	1.0	4	2.23	77.4	83.6
Ana-0950-060	53 ST	950	1153	46 AVE	47 AVE	203	ART	0.1	2.4	2.5	2.9	3	3.43	76.0	85.4
Ana-0950-070	53 ST	1153	1361	47 AVE	48 AVE WB	208	ART	0.1	15.9	16.0	5.5	6	3.66	58.2	68.1
Ana-0950-080	53 ST	1362	1538	48A AVE	49 AVE	176	ART	0.3	0.5	0.8	0.0	2	1.70	96.2	99.1
Ana-0950-090	53 ST	1538	1710	49 AVE	50 AVE	172	ART	1.0	1.0	2.0	0.0	3	2.15	89.4	97.8
Ana-0950-100	53 ST	1710	1883	50 AVE	51 AVE	173	ART	0.0	0.4	0.4	0.0	2	2.57	99.5	99.6
Ana-0950-110	53 ST	1883	2029	51 AVE	52 AVE	146	ART	0.0	0.4	0.4	0.0	2	2.68	99.4	92.3

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-0950-120	53 ST	2029	2196	52 AVE	53 AVE	167	ART	0.0	0.5	0.5	0.0	2	2.00	99.7	99.5
Ana-0950-130	53 ST	2196	2298	53 AVE	53A AVE	102	ART	0.0	0.2	0.2	0.0	2	1.99	99.7	96.3
Ana-0950-140	53 ST	2298	2399	53A AVE	54 AVE	101	ART	0.0	0.4	0.4	0.0	2	2.55	99.6	99.6
Ana-0950-150	53 ST	2399	2603	54 AVE	55 AVE	204	ART	0.0	0.2	0.2	0.0	2	2.11	99.8	99.8
Ana-0950-160	53 ST	2603	3606	55 AVE	HWY 833	1003	ART	0.1	0.2	0.4	0.1	5	1.88	85.0	99.6
Ana-0960-010	53 ST_SB	0	321	NO NAME	North End	321	ART	0.3	0.4	0.7	1.8	2	1.87	86.8	86.9
Ana-0970-020	53A AVE	56	210	53 ST	52 ST	154	LOC	0.4	1.8	2.2	0.2	4	3.68	92.9	97.8
Ana-0980-010	53A ST	0	107	48A AVE	North End	107	LOC	3.3	8.9	12.2	12.1	2	2.42	50.6	87.0
Ana-0990-010	54 AVE	0	76	68 ST	67 ST	76	COL	8.7	7.1	15.8	1.1	3	3.35	41.8	79.2
Ana-0990-020	54 AVE	76	213	67 ST	66 ST	137	COL	8.7	13.1	21.7	0.9	3	3.15	39.3	75.5
Ana-0990-030	54 AVE	213	308	66 ST	65 ST	95	COL	7.9	10.0	17.9	1.0	4	5.12	36.6	71.5
Ana-0990-040	54 AVE	308	390	65 ST	64 ST	82	COL	3.1	6.5	9.6	0.0	3	3.07	67.9	89.9
Ana-0990-050	54 AVE	390	468	64 ST	63 ST	78	COL	6.4	7.5	13.9	0.7	3	2.86	47.9	83.3
Ana-0990-060	54 AVE	468	691	63 ST	62 ST	223	COL	7.9	9.9	17.8	3.3	5	4.46	39.6	71.6
Ana-0990-070	54 AVE	691	788	62 ST	61 ST CL	97	COL	0.3	0.6	0.9	0.1	2	1.90	94.9	98.9
Ana-0990-080	54 AVE	788	1009	61 ST CL	60 ST	221	COL	0.0	0.2	0.2	0.0	2	2.04	99.9	99.8
Ana-0990-090	54 AVE	1009	1176	60 ST	58 ST	167	COL	0.0	0.3	0.3	0.0	2	2.23	99.7	99.7
Ana-0990-100	54 AVE	1176	1475	58 ST	56 ST	299	COL	0.0	0.0	0.0	0.1	1	2.09	98.3	100.0
Ana-0990-110	54 AVE	1475	1592	56 ST	55 ST	117	COL	0.0	0.0	0.0	0.0	2	2.31	100	100.0
Ana-0990-120	54 AVE	1592	1710	55 ST	54 ST	118	COL	0.0	0.0	0.0	0.0	2	1.81	99.1	99.9
Ana-0990-130	54 AVE	1710	1827	54 ST	53 ST	117	COL	1.1	0.5	1.6	0.1	3	2.42	85.7	97.7
Ana-0990-140	54 AVE	1827	1982	53 ST	52 ST	155	COL	13.7	9.7	23.4	7.0	11	4.74	19.0	58.6
Ana-0990-150	54 AVE	1982	2080	52 ST	51 ST	98	COL	12.8	11.6	24.4	6.2	10	4.75	21.4	65.7
Ana-0990-160	54 AVE	2080	2180	51 ST	50 ST	100	COL	15.2	11.9	27.1	7.2	9	4.12	17.0	62.3
Ana-0990-170	54 AVE	2180	2433	50 ST	NO NAME	253	COL	6.9	11.4	18.3	18.5	8	6.67	29.0	72.6
Ana-0990-180	54 AVE	2433	2476	NO NAME	48 ST	43	COL	2.0	4.5	6.6	19.4	7	5.46	47.0	74.7
Ana-0990-190	54 AVE	2476	2528	48 ST	47 ST	52	COL	1.5	7.4	8.9	19.4	8	4.80	46.3	70.1
Ana-0990-200	54 AVE	2528	2645	47 ST	46 ST	117	COL	2.3	7.0	9.3	3.9	4	3.71	53.7	74.7
Ana-1000-010	54 ST	0	271	45 AVE	46 AVE	271	LOC	0.0	0.9	0.9	0.3	2	2.36	92.3	99.1
Ana-1000-020	54 ST	272	469	47 AVE	48 AVE	197	LOC	1.1	4.2	5.3	0.0	1	6.78	87.3	94.7
Ana-1000-030	54 ST	470	642	48A AVE	49 AVE	172	LOC	6.3	19.9	26.2	9.8	2	3.88	41.9	73.4
Ana-1000-040	54 ST	642	815	49 AVE	50 AVE	173	LOC	5.5	15.2	20.8	4.0	3	4.98	54.3	77.8
Ana-1000-050	54 ST	815	987	50 AVE	51 AVE	172	LOC	2.7	8.6	11.3	1.4	3	5.18	67.5	88.3
Ana-1000-070	54 ST	1040	1190	52 AVE	53 AVE	150	LOC	0.4	3.3	3.8	0.7	2	8.84	89.7	96.2
Ana-1000-080	54 ST	1190	1392	53 AVE	54 AVE	202	LOC	0.6	6.0	6.6	0.0	1	10.87	87.9	93.4
Ana-1010-010	54A AVE	0	103	62 ST	61 ST CL	103	LOC	1.9	10.3	12.2	0.3	3	4.48	75.9	87.8
Ana-1010-020	54A AVE	103	240	61 ST CL	60 ST	137	LOC	2.1	7.4	9.5	0.2	2	3.55	78.8	90.5
Ana-1010-030	54A AVE	241	307	59 ST	58 ST	66	LOC	2.8	4.2	7.0	0.0	3	7.52	74.6	92.5
Ana-1010-040	54A AVE	308	355	50 ST	NO NAME	47	LOC	0.0	0.0	0.0	0.0	2	3.72	100	100.0
Ana-1020-010	54B AVE	0	65	59 ST	58 ST	65	LOC	0.5	0.2	0.7	0.0	2	11.80	94.1	99.3
Ana-1030-010	55 AVE	0	50	South End	66 ST	50	LOC	1.1	16.7	17.8	0.0	2	3.79	76.1	82.2
Ana-1030-020	55 AVE	50	180	66 ST	65 ST	130	LOC	2.2	8.8	11.0	0.0	2	3.75	81.6	89.0
Ana-1030-030	55 AVE	181	298	64 ST	63 ST	117	LOC	8.2	15.0	23.2	0.0	2	4.57	64.4	76.7
Ana-1030-040	55 AVE	299	464	55 AVE CL / 60 ST	58 ST	165	LOC	0.8	1.9	2.8	0.0	2	3.79	88.4	97.0
Ana-1030-060	55 AVE	516	613	51 ST	50 ST	97	LOC	3.1	11.8	15.0	0.9	3	5.99	60.8	84.2
Ana-1030-070	55 AVE	613	700	50 ST	49 ST	87	LOC	6.1	12.9	19.0	1.8	4	6.13	47.8	78.7
Ana-1030-080	55 AVE	700	962	49 ST	47 ST	262	LOC	10.7	18.0	28.6	3.1	4	6.41	41.0	71.0
Ana-1040-010	55 AVE CL	0	56	NO NAME	55 AVE / 60 ST	56	LOC	1.5	10.3	11.8	1.0	2	3.78	74.3	88.2
Ana-1050-010	55 ST	0	85	28 AVE	28A AVE CL	85	LOC	0.0	0.0	0.0	0.3	2	5.77	94.6	99.9
Ana-1050-020	55 ST	86	343	PARKVIEW DR	43 AVE	257	COL	6.3	9.0	15.3	0.5	3	3.79	57.3	73.0
Ana-1050-030	55 ST	343	494	43 AVE	44 AVE	151	COL	2.0	4.8	6.9	0.9	3	2.37	76.9	92.9
Ana-1050-040	55 ST	495	627	South End	45 AVE	132	LOC	2.1	2.0	4.1	0.0	2	3.31	77.6	94.9
Ana-1050-050	55 ST	628	836	47 AVE	North End	208	LOC	3.1	6.4	9.6	0.1	1	4.96	76.4	90.2
Ana-1050-060	55 ST	837	974	52 AVE	53 AVE	137	LOC	1.1	10.7	11.8	0.0	3	5.29	81.9	88.2
Ana-1050-070	55 ST	974	1176	53 AVE	54 AVE	202	LOC	0.3	2.2	2.5	0.1	3	4.13	93.0	97.5
Ana-1060-010	56 ST	0	59	23 AVE	23A AVE CL	59	LOC	0.9	0.0	0.9	0.0	2	3.88	82.5	98.6
Ana-1060-020	56 ST	59	152	23A AVE CL	24 AVE CL	93	LOC	0.6	0.0	0.6	0.0	1	3.11	88.7	99.0
Ana-1060-030	56 ST	152	244	24 AVE CL	25 AVE	92	LOC	0.8	0.8	1.6	0.0	1	3.41	91.9	98.4
Ana-1060-040	56 ST	244	333	25 AVE	26 AVE CL	89	LOC	2.3	2.3	4.6	0.0	2	2.45	85.5	95.4
Ana-1060-050	56 ST	333	439	26 AVE CL	27 AVE CL	106	LOC	0.8	1.6	2.4	0.0	1	2.77	92.1	97.6
Ana-1060-060	56 ST	439	570	27 AVE CL	28 AVE	131	LOC	0.0	0.0	0.0	0.0	2	3.73	100	100.0
Ana-1060-070	56 ST	571	774	46 AVE	47 AVE	203	LOC	0.7	2.3	3.0	0.1	1	3.77	90.2	97.0
Ana-1060-080	56 ST	774	913	47 AVE	47A AVE	139	LOC	0.0	1.3	1.3	0.0	2	2.99	98.0	98.7
Ana-1060-090	56 ST	913	982	47A AVE	48 AVE WB	69	LOC	0.9	3.5	4.4	0.0	2	2.33	85.1	95.6
Ana-1060-100	56 ST	983	1026	South End	49 AVE	43	LOC	0.0	0.4	0.4	0.0	2	2.68	99.4	99.6
Ana-1060-110	56 ST	1026	1199	49 AVE	50 AVE	173	LOC	5.9	18.3	24.2	0.2	1	3.41	65.6	75.8
Ana-1060-120	56 ST	1199	1371	50 AVE	51 AVE	172	LOC	4.0	11.0	15.0	0.6	2	8.34	71.4	85.0
Ana-1060-140	56 ST	1444	1485	South End	52 AVE	41	LOC	0.0	0.0	0.0	0.0	1	4.40	100	100.0
Ana-1060-150	56 ST	1485	1605	52 AVE	53 AVE	120	LOC	0.8	2.3	3.0	0.0	1	5.49	88.4	97.0
Ana-1060-160	56 ST	1605	1707	53 AVE	53A AVE	102	LOC	2.0	6.4	8.4	0.3	3	5.42	80.7	91.5
Ana-1060-170	56 ST	1707	1807	53A AVE	54 AVE	100	LOC	2.4	7.6	10.1	0.0	2	2.61	77.1	89.9
Ana-1070-010	56 ST CL	0	80	South End	39 AVE	80	LOC	3.3	11.2	14.5	2.2	3		64.4	84.9
Ana-1080-010	56A ST CL	1	117	39 AVE	Northeast End	116	LOC	9.5	24.1	33.6	5.9	4	8.30	40.8	73.2
Ana-1090-010	57 ST	0	44	23 AVE	24 AVE CL	44	LOC	0.0	0.0	0.0	0.0	1	3.27	100	100.0
Ana-1090-020	57 ST	44	185	24 AVE CL	25 AVE	141	LOC	0.4	0.0	0.4	0.0	2	3.76	92.6	99.4
Ana-1090-030	57 ST	185	419	25 AVE	28 AVE	234	LOC	0.5	0.9	1.4	0.0	1	2.90	89.8	98.4
Ana-1090-040	57 ST	419	506	28 AVE	28A AVE CL	87	LOC	3.3	8.5	11.8	0.0	2	3.63	73.7	88.0
Ana-1090-050	57 ST	507	666	ENEVOLD DR	35 AVE	159	LOC	6.8	16.3	23.1	0.7	3	4.50	66.8	76.9
Ana-1090-060	57 ST	666	749	35 AVE	36 AVE	83	LOC	5.8	19.3	25.1	0.6	2	4.29	65.6	75.0
Ana-1090-070	57 ST	750	847	39 AVE	MARLER DR	97	LOC	3.7	10.4	14.1	6.0	6	9.81	54.8	84.5
Ana-1090-080	57 ST	848	1048	46 AVE	47 AVE	200	LOC	1.6	4.8	6.3	0.4	1	3.27	83.0	93.7
Ana-1090-090	57 ST	1049	1090	South End	49 AVE	41	LOC	7.2	15.5	22.7	0.6	2		63.1	77.3
Ana-1090-100	57 ST	1090	1263	49 AVE	50 AVE	173	LOC	6.5	16.1	22.6	0.8	1	3.74	62.6	77.1
Ana-1090-110	57 ST	1263	1349	50 AVE	50A AVE	86	LOC	7.8	22.2	29.9	0.7	2	4.43	62.2	75.0
Ana-1090-120	57 ST	1349	1435	50A AVE	51 AVE	86	LOC	5.9	15.9	21.7	1.5	2	4.84	64.9	78.3
Ana-1090-130	57 ST	1435	1534	51 AVE	North End	99	LOC	2.1	10.0	12.1	0.7	2	3.84	78.6	87.9
Ana-1090-140	57 ST	1535	1668	South End	53 AVE	133	LOC	0.0	0.6	0.6	0.0	2	2.97	99.4	99.4
Ana-1100-010	58 ST	0	72	36 AVE	37 AVE CL	72	LOC	0.1	0.2	0.3	0.0	1	4.10	95.5	99.7
Ana-1100-020	58 ST	72	154	37 AVE CL	MOUNT PLEASANT DR	82	LOC	0.1	0.7	0.8	0.0	1	3.52	91.7	99.2
Ana-1100-030	58 ST	154	251	MOUNT PLEASANT DR	38 AVE CL	97	LOC	0.3	1.7	2.0	0.0	1	2.45	95.3	98.0
Ana-1100-040	58 ST	251	472	38 AVE CL	39 AVE / 39 AVE CL	221	LOC	0.4	0.5	0.8	0.0	2	2.58	96.1	99.2
Ana-1100-050	58 ST	473	548	48 AVE	48A AVE	75	LOC	2.8	9.9	12.7	0.0	3	5.23	68.5	86.7
Ana-1100-060	58 ST	548	587	48A AVE	48B AVE	39	LOC	2.7	12.6	15.3	0.0	2	4.39	72.6	84.7
Ana-1100-070	58 ST	588	757	49 AVE	50 AVE / GRAND DR	169	LOC	1.7	7.9	9.6	3.9	2	3.76	67.9	90.3
Ana-1100-080	58 ST	757	929	50 AVE / GRAND DR	51 AVE	172	LOC	1.9	9.1	11.0	2.2	2	5.70	73.4	88.9
Ana-1100-090	58 ST	929	1030	51 AVE	North End	101	LOC	2.3	7.7	10.0	2.9	2	3.74	71.9	90.0
Ana-1100-110	58 ST	1118	1222	54 AVE	54A AVE	104	LOC	0.6	1.3	1.8	0.0	3	3.86	92.6	98.2
Ana-1100-120	58 ST	1222	1319	54A AVE	54B AVE	97	LOC	0.0	0.0	0.1	0.0	3	3.11	99.7	99.9
Ana-1100-130	58 ST	1319	1418	54B AVE	55 AVE	99	LOC	0.1	0.0	0.1	0.0	2	3.78	90.8	99.8
Ana-1110-010	58 ST CL	0	61	ENEVOLD DR	North End	61	LOC	0.5	4.3	4.8	0.5	3	5.54	89.1	95.2
Ana-1110-020	58 ST CL	62	224	42 AVE	Southeast End	162	LOC	9.7	14.1	23.9	1.8	4	13.34	42.3	72.8
Ana-1110-030	58 ST CL	225	436	53 AVE	Southwest End	211	LOC	1.0	3.8	4.8	0.1	3	7.30	85.9	95.0
Ana-1120-010	59 ST	46	142	MARLER DR	41 AVE	96	LOC	5.5	16.9	22.4	1.7	4	8.47	55.0	76.7
Ana-1120-020	59 ST	143	236	43 AVE	44 AVE	93	LOC	8.8	15.8	24.5	8.1	4	4.81	32.8	73.5
Ana-1120-030	59 ST	237	332	54A AVE	54B AVE	95	LOC	0.6	0.9	1.5	0.0	2	4.56	91.4	98.5
Ana-1130-010	59 ST CL	0	70	South End	28 AVE	70	LOC	0.0	7.6	7.6	0.0	2		90.7	92.4
Ana-1130-020	59 ST CL	71	131	ENEVOLD DR	North End	60	LOC	1.1	5.5	6.6	1.1	3	4.86	81.5	93.4

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-1130-030	59 ST CL	132	273	Southwest End	MARLER DR	141	LOC	52.7	61.9	100.0	8.8	4	8.21	7.5	57.8
Ana-1130-040	59 ST CL	274	422	42 AVE	North End	148	LOC	4.7	12.0	16.7	0.6	4	7.44	62.5	82.2
Ana-1140-010	60 ST	0	124	41 AVE	42 AVE	124	LOC	4.9	6.9	11.8	1.2	4	4.76	63.2	86.8
Ana-1140-020	60 ST	125	165	South End	48A AVE	40	LOC	7.8	34.3	42.1	2.8	3		33.1	73.5
Ana-1140-030	60 ST	165	255	48A AVE	48B AVE	90	LOC	3.6	14.3	17.9	3.0	2	4.04	63.8	81.9
Ana-1140-040	60 ST	256	472	South End	54 AVE	216	LOC	2.6	7.6	10.2	0.3	1	4.09	77.0	89.6
Ana-1140-050	60 ST	472	574	54 AVE	54A AVE	102	COL	0.3	6.7	7.0	0.0	2	4.47	87.6	74.9
Ana-1140-060	60 ST	574	772	54A AVE	55 AVE / 55 AVE CL	198	COL	3.5	18.8	22.3	0.3	3	2.32	65.7	77.7
Ana-1140-070	60 ST	772	789	55 AVE / 55 AVE CL		17	COL	0.0	1.5	1.5	0.0	3		97.9	98.5
Ana-1150-010	60 ST CL	0	45	South End	28 AVE	45	LOC	8.5	12.7	21.2	0.0	2		65.4	78.8
Ana-1150-020	60 ST CL	46	127	42 AVE	NO NAME	81	LOC	20.1	33.3	53.4	3.2	4	8.47	26.2	67.2
Ana-1160-010	600 PARKRIDGE CL	0	51	PARKRIDGE DR / PARKRIDGE DR_1	NO NAME	51	LOC	2.5	12.0	14.4	1.6	4	9.34	66.0	85.4
Ana-1170-010	61 ST	0	103	45 AVE	MONTJOY AVE	103	LOC	8.3	26.4	34.7	0.0	3	6.06	54.9	74.4
Ana-1170-020	61 ST	103	329	MONTJOY AVE	47 AVE	226	LOC	5.2	16.2	21.4	0.2	5	6.14	65.1	78.0
Ana-1170-030	61 ST	329	423	47 AVE	47A AVE	94	LOC	1.1	6.4	7.5	0.0	2	5.41	86.9	92.5
Ana-1180-010	61 ST CL	0	51	28 AVE	Northwest End	51	LOC	0.0	0.0	0.0	0.0	1	8.37	100	100.0
Ana-1180-020	61 ST CL	52	109	Southwest End	54 AVE	57	LOC	0.8	6.8	7.6	0.0	6		76.3	91.9
Ana-1180-030	61 ST CL	110	148	54A AVE	Northeast End	38	LOC	1.8	6.4	8.3	0.0	3		78.4	91.7
Ana-1190-010	61A ST	0	162	30 AVE	32 AVE	162	LOC	3.1	26.0	29.1	0.0	2	5.26	68.9	75.0
Ana-1190-020	61A ST	162	256	32 AVE	ENEVOLD DR	94	LOC	2.7	10.6	13.3	0.0	2	4.22	77.5	86.7
Ana-1190-030	61A ST	256	354	ENEVOLD DR	61A ST_1	98	LOC	1.7	24.1	25.7	0.2	4	7.81	74.6	75.0
Ana-1190-040	61A ST	354	427	61A ST_1	35 AVE	73	LOC	2.9	41.1	44.0	4.5	6	12.36	54.2	75.0
Ana-1200-010	61A ST_1	0	29	West End	61A ST	29	LOC	1.9	9.3	11.1	0.0	3		78.8	88.9
Ana-1210-010	62 ST	0	124	VALLEYVIEW DR	24 AVE	124	COL	0.1	0.0	0.1	0.0	2	4.62	91.7	74.9
Ana-1210-020	62 ST	124	272	24 AVE	26 AVE	148	COL	0.0	0.1	0.1	0.0	2	4.61	100	75.0
Ana-1210-030	62 ST	272	396	26 AVE	28 AVE	124	COL	0.0	0.0	0.0	0.0	2	2.39	100	100.0
Ana-1210-040	62 ST	396	532	28 AVE	CAMROSE DR	136	COL	0.0	0.5	0.5	0.0	3	3.29	98.6	99.5
Ana-1210-050	62 ST	533	765	ERICKSON DR	39 AVE	232	LOC	5.7	12.0	17.8	1.0	4	7.68	58.8	80.7
Ana-1210-060	62 ST	766	1048	East End	42 AVE	282	LOC	1.5	6.3	7.8	0.0	3	7.04	87.2	92.2
Ana-1210-070	62 ST	1049	1121	NO NAME	43 AVE	72	LOC	2.8	6.5	9.3	1.7	4	6.93	69.7	90.4
Ana-1210-080	62 ST	1122	1241	44B AVE	45 AVE	119	LOC	4.0	13.3	17.3	0.8	2	4.78	64.0	82.1
Ana-1210-090	62 ST	1242	1331	53 AVE	54 AVE	89	LOC	7.1	16.7	23.8	0.9	2	8.71	57.0	75.9
Ana-1210-100	62 ST	1331	1426	54 AVE	54A AVE	95	LOC	11.4	6.8	18.2	0.3	2	4.32	44.2	76.4
Ana-1210-110	62 ST	1426	1506	54A AVE	Northeast End	80	LOC	4.1	6.3	10.4	0.0	2	5.41	76.7	88.2
Ana-1220-010	62 ST CL	0	152	30 AVE	Northwest End	152	LOC	2.4	9.6	12.1	0.0	2	3.56	79.1	87.9
Ana-1230-010	62A ST	0	118	30 AVE	ELLIOTT DR	118	LOC	4.4	38.1	42.5	0.5	3	2.68	56.2	74.6
Ana-1230-020	62A ST	119	171	NO NAME	ENEVOLD DR	52	LOC	4.5	8.0	12.5	34.9	4	7.19	22.5	82.8
Ana-1240-010	63 ST	0	95	26 AVE	27 AVE	95	LOC	0.0	0.0	0.0	0.3	2	3.29	96.8	99.9
Ana-1240-020	63 ST	95	168	27 AVE	28 AVE	73	LOC	0.0	0.0	0.0	0.0	1	3.37	100	100.0
Ana-1240-030	63 ST	169	254	30 AVE	63 ST CL / ELLIOTT DR	85	LOC	4.2	20.3	24.5	0.0	2	2.51	71.1	75.5
Ana-1240-040	63 ST	255	350	63 ST CL / ERICKSON DR	38 AVE CL	95	LOC	4.8	9.7	14.5	1.6	9	9.55	48.4	83.4
Ana-1240-050	63 ST	350	532	38 AVE CL	39 AVE	182	LOC	7.4	11.6	19.0	2.1	7	5.18	42.9	77.9
Ana-1240-060	63 ST	532	633	39 AVE	MARLER DR	101	LOC	4.2	7.4	11.6	2.2	10	5.94	61.7	86.6
Ana-1240-070	63 ST	633	735	MARLER DR	41 AVE	102	LOC	6.5	7.6	14.1	1.3	4	8.07	58.6	83.1
Ana-1240-080	63 ST	735	799	41 AVE	42 AVE	64	LOC	15.3	10.0	25.2	0.4	5	7.11	35.5	67.6
Ana-1240-090	63 ST	800	880	NO NAME	43 AVE	80	LOC	4.7	13.5	18.2	0.5	6	6.59	65.5	80.9
Ana-1240-100	63 ST	881	976	43 AVE	43A AVE CL	95	LOC	1.0	4.9	5.9	0.4	2	4.08	82.9	94.1
Ana-1240-110	63 ST	976	1115	43A AVE CL	44A AVE	139	LOC	4.4	10.8	15.1	0.0	2	4.19	68.6	84.3
Ana-1240-120	63 ST	1115	1203	44A AVE	44B AVE	88	LOC	3.8	10.4	14.2	1.7	2	3.82	68.4	85.1
Ana-1240-130	63 ST	1204	1300	54 AVE	55 AVE	96	LOC	6.0	19.0	25.0	0.0	2	3.92	65.5	75.0
Ana-1250-010	63 ST CL	0	117	63 ST / ELLIOTT DR	North End	117	LOC	6.0	13.6	19.6	0.0	2	3.26	69.4	80.4
Ana-1250-020	63 ST CL	118	182	NO NAME	63 ST / ERICKSON DR	64	LOC	5.6	15.3	20.8	12.0	5		40.9	78.6
Ana-1260-010	64 ST	0	170	32 AVE	35 AVE	170	LOC	8.0	18.8	26.8	0.0	1	3.59	65.6	75.0
Ana-1260-020	64 ST	171	352	Northeast End	39 AVE	181	LOC	3.6	9.4	13.1	1.0	3	7.20	72.0	86.5
Ana-1260-030	64 ST	353	459	N 48 AVE SERVICE RD	48A AVE	106	LOC	12.7	10.7	23.4	2.3	3		39.7	72.5
Ana-1260-040	64 ST	459	553	48A AVE	48B AVE	94	LOC	4.7	18.7	23.4	4.4	6	9.53	50.5	75.7
Ana-1260-050	64 ST	553	594	48B AVE	49 AVE	41	LOC	7.9	25.2	33.1	1.8	5	9.08	35.0	72.7
Ana-1260-060	64 ST	594	648	49 AVE	49 AVE	54	LOC	5.3	21.1	26.4	2.1	6	10.45	40.3	73.3
Ana-1260-070	64 ST	648	695	49 AVE	50 AVE	47	LOC	6.7	18.0	24.7	0.9	6	8.61	37.6	72.4
Ana-1260-080	64 ST	696	787	53 AVE	54 AVE	91	LOC	1.7	24.0	25.6	0.3	5	4.47	68.9	75.0
Ana-1260-090	64 ST	787	884	54 AVE	55 AVE	97	LOC	1.6	9.3	10.9	0.6	2	4.28	77.1	89.1
Ana-1270-010	64 ST CL	0	65	ENEVOLD DR	North End	65	LOC	4.2	2.5	6.7	5.0	3		53.2	91.3
Ana-1270-020	64 ST CL	66	157	NO NAME	43 AVE	91	LOC	10.5	28.8	39.2	2.3	7	7.85	31.1	72.1
Ana-1280-010	65 ST	0	309	38 AVE / 66 ST	MARLER DR	309	COL	16.5	19.3	35.9	3.6	4	5.58	32.8	67.2
Ana-1280-020	65 ST	309	563	MARLER DR	43 AVE	254	COL	11.9	19.7	31.6	0.1	2	3.55	59.5	71.9
Ana-1280-030	65 ST	563	885	43 AVE	44B AVE	322	COL	5.0	13.7	18.7	0.2	2	3.51	72.0	73.6
Ana-1280-040	65 ST	885	976	44B AVE	45 AVE	91	COL	2.6	11.0	13.6	0.8	3	2.56	69.2	85.9
Ana-1280-050	65 ST	976	1067	45 AVE	45A AVE	91	COL	2.5	14.7	17.2	0.5	2	2.92	69.3	82.4
Ana-1280-060	65 ST	1067	1155	45A AVE	46 AVE	88	COL	1.8	16.0	17.7	0.0	1	2.09	75.3	82.3
Ana-1280-070	65 ST	1155	1486	46 AVE	S 48TH AVE SERVICE RD	331	COL	1.8	7.1	8.9	0.1	2	3.03	83.1	91.1
Ana-1280-080	65 ST	1486	1509	S 48TH AVE SERVICE RD	48 AVE	23	COL	1.0	3.9	5.0	0.0	4		89.3	95.0
Ana-1280-090	65 ST	1510	1587	50 AVE	50A AVE	77	LOC	4.2	8.3	12.5	1.1	8		58.2	86.3
Ana-1280-100	65 ST	1588	1685	54 AVE	55 AVE	97	LOC	6.4	11.4	17.8	0.0	2	4.19	61.5	81.6
Ana-1290-010	65A ST	0	79	50 AVE	50A AVE	79	LOC	6.8	14.3	21.0	3.0	9		42.6	77.3
Ana-1300-010	66 ST	0	172	66A ST	38 AVE / 65 ST	172	COL	13.3	22.0	35.3	1.6	3	4.72	33.7	70.2
Ana-1300-020	66 ST	173	291	42 AVE	43 AVE	118	LOC	3.6	18.3	22.0	0.0	1	3.49	64.2	77.5
Ana-1300-030	66 ST	291	344	43 AVE	43 AVE	53	LOC	4.3	6.1	10.4	0.8	3	7.20	59.3	88.2
Ana-1300-040	66 ST	344	440	43 AVE	44 AVE	96	LOC	1.6	1.8	3.3	0.7	2	4.72	84.8	95.9
Ana-1300-050	66 ST	440	591	44 AVE	44B AVE	151	LOC	0.0	0.1	0.1	0.0	1	3.46	100	99.9
Ana-1300-060	66 ST	592	680	44B AVE	45 AVE	88	LOC	2.1	6.6	8.7	0.3	2	3.86	78.9	91.3
Ana-1300-070	66 ST	686	940	48 AVE WB	49 AVE	254	COL	3.4	11.6	15.0	1.6	5	6.24	58.4	74.0
Ana-1300-080	66 ST	940	1047	49 AVE	50 AVE	107	COL	4.2	10.8	15.0	0.8	5	5.58	55.3	73.3
Ana-1300-090	66 ST	1047	1312	50 AVE	GOLF COURSE	265	LOC	8.4	31.3	39.7	4.1	3	3.30	34.4	72.8
Ana-1300-100	66 ST	1314	1412	55 AVE	54 AVE	98	LOC	4.8	12.5	17.3	0.3	3	7.38	61.9	82.0
Ana-1300-110	66 ST	1412	1503	54 AVE	53 AVE	91	LOC	2.6	1.7	4.3	0.0	4	5.42	72.6	94.5
Ana-1310-010	66 ST CL	0	48	South End	31 AVE	48	LOC	7.0	13.9	20.9	0.0	2		67.4	79.1
Ana-1310-020	66 ST CL	49	92	45 AVE	North End	43	LOC	3.8	17.3	21.2	0.0	2	7.95	69.1	78.8
Ana-1320-010	66A ST	0	140	ENEVOLD DR	66 ST	140	COL	12.7	27.2	39.9	2.9	4	6.83	36.0	71.2
Ana-1320-020	66A ST	141	227	44 AVE	NO NAME	86	LOC	4.3	8.9	13.2	0.0	1	3.95	84.0	86.8
Ana-1330-010	67 ST	0	108	30 AVE	31 AVE	108	LOC	4.4	7.9	12.3	0.0	2	3.03	75.1	87.7
Ana-1330-020	67 ST	109	196	32 AVE	33 AVE	87	LOC	0.9	13.5	14.4	0.0	1	3.16	81.6	85.6
Ana-1330-030	67 ST	196	285	33 AVE	34 AVE	89	LOC	3.6	41.0	44.7	0.6	3	7.04	60.6	74.6
Ana-1330-040	67 ST	285	370	34 AVE	35 AVE	85	LOC	7.0	52.5	59.5	1.0	4	7.13	52.7	74.6
Ana-1330-050	67 ST	371	529	38 AVE	67 ST_1	158	LOC	8.4	16.2	24.6	4.1	5	11.68	44.3	72.7
Ana-1330-060	67 ST	529	632	67 ST_1	MARLER DR	103	LOC	8.1	13.8	22.0	2.2	3	7.91	45.2	74.8
Ana-1330-070	67 ST	632	733	MARLER DR	42 AVE	101	LOC	19.2	39.0	58.2	4.8	4	7.36	22.6	72.4
Ana-1330-080	67 ST	733	901	42 AVE	43 AVE	168	LOC	8.6	16.8	25.4	24.9	5	6.34	34.3	71.7
Ana-1330-090	67 ST	902	1095	44 AVE	44B AVE	193	LOC	0.0	0.0	0.0	0.0	1	3.40	100	100.0
Ana-1330-100	67 ST	1096	1254	45 AVE	NO NAME	158	LOC	6.5	9.1	15.6	0.0	2	3.70	63.4	83.2
Ana-1330-110	67 ST	1255	1345	53 AVE	54 AVE	90	LOC	2.0	4.3	6.3	0.3	3	6.13	79.3	93.7
Ana-1340-010	67 ST_1	0	207	38 AVE	67 ST	207	LOC	6.9	20.3	27.2	3.3	4	9.94	44.8	73.4
Ana-1350-010	68 ST	0	102	CAMROSE DR / RGE RD 204	NO NAME	102	ART	0.0	0.0	0.0	0.0	2	1.75	100	100.0
Ana-1350-020	68 ST	102	587	NO NAME	NO NAME	485	ART	0.0	0.6	0.6	1.2	3	1.89	90.6	99.4
Ana-1350-030	68 ST	587	1132	NO NAME	NO NAME	545	ART	0.0	0.2	0.2	0.3	3	1.99	97.3	99.8
Ana-1350-040	68 ST	1132	1203	NO NAME	MARLER DR	71	ART	0.0	0.0	0.0	0.4	4	2.37	96.6	99.9
Ana-1350-050	68 ST	1203	1765	MARLER DR		562	ART	0.1	1.9	2.0	3.4	4	2.40	72.3	98.0
Ana-1350-060	68 ST	1765	1865		45 AVE	100	ART	0.0	0.0	0.0	0.4	2	2.74	94.7	99.9

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-1350-070	68 ST	1865	2367	45 AVE	48 AVE	502	ART	0.1	0.2	0.3	0.1	1	1.77	98.4	99.6
Ana-1350-080	68 ST	2367	2794	48 AVE	50 AVE	427	ART	17.0	26.8	43.8	0.6	5	3.27	30.5	55.0
Ana-1350-090	68 ST	2796	3208	Southwest End		412	ART	0.2	0.5	0.7	0.0	3	2.21	97.8	99.3
Ana-1350-100	68 ST	3208	3593		54 AVE	385	ART	8.7	23.2	31.9	2.0	3	2.69	43.3	72.8
Ana-1360-010	68 ST SB	0	169	South End	45 AVE	169	ART	0.5	2.0	2.5	2.0	5	2.20	74.8	97.2
Ana-1360-020	68 ST SB	169	671	45 AVE	48 AVE	502	ART	0.9	7.9	8.8	0.0	3	2.27	83.0	90.9
Ana-1360-030	68 ST SB	671	1105	48 AVE	50 AVE	434	ART	8.6	11.2	19.8	0.5	4	3.11	46.1	63.3
Ana-1370-010	68A ST	0	127	37A AVE	38 AVE	127	LOC	4.0	13.2	17.2	0.0	2	4.03	69.3	82.8
Ana-1380-010	69 ST	0	40	South End	37A AVE	40	COL	5.0	15.6	20.6	0.0	2	8.06	68.6	73.7
Ana-1380-020	69 ST	40	142	37A AVE	38 AVE	102	COL	2.3	17.3	19.6	0.0	2	7.02	75.1	74.4
Ana-1380-030	69 ST	142	217	38 AVE	38 AVE / 69A ST CL	75	COL	5.0	29.4	34.4	0.1	3	6.60	64.5	73.8
Ana-1380-040	69 ST	217	301	38 AVE / 69A ST CL	39 AVE CL	84	COL	1.4	17.5	18.9	0.6	4	7.16	76.3	74.8
Ana-1380-050	69 ST	301	395	39 AVE CL	40 AVE CL	94	COL	2.5	11.7	14.2	0.1	3	4.33	76.6	74.4
Ana-1380-060	69 ST	395	492	40 AVE CL	MARLER DR	97	COL	4.3	13.3	17.6	0.8	2	5.05	61.9	73.4
Ana-1380-070	69 ST	492	590	MARLER DR	42 AVE	98	COL	4.3	7.2	11.5	0.5	2	3.55	69.0	73.6
Ana-1380-080	69 ST	590	664	42 AVE	42A AVE	74	COL	9.5	26.5	36.0	0.0	1	4.51	61.6	72.6
Ana-1380-090	69 ST	664	824	42A AVE	43 AVE / 70 ST	160	COL	11.5	22.2	33.8	0.0	1	3.18	64.1	75.0
Ana-1380-110	69 ST	1079	1256	45 AVE	46 AVE	177	LOC	1.9	13.3	15.2	0.0	4	6.61	78.4	84.8
Ana-1380-120	69 ST	1257	1341	49A AVE	50 AVE	84	LOC	1.0	2.2	3.2	0.0	1	4.47	87.9	96.8
Ana-1390-010	69A ST CL	0	122	38 AVE / 69 ST	Northwest End	122	LOC	0.3	5.1	5.4	0.0	2	6.05	90.3	94.6
Ana-1390-020	69A ST CL	123	222	South End	MARLER DR	99	LOC	1.3	3.8	5.0	0.4	2	9.91	85.1	95.0
Ana-1400-010	70 ST	0	43	38 AVE	Northwest End	43	LOC	2.2	7.7	9.8	0.0	2	5.50	79.6	90.2
Ana-1400-020	70 ST	44	106	South End	43 AVE / 69 ST	62	LOC	2.4	12.1	14.5	0.0	2		76.0	85.5
Ana-1400-030	70 ST	107	199	50 AVE	51 AVE	92	LOC	0.6	2.5	3.1	0.0	2		90.7	96.9
Ana-1410-010	71 ST	0	124	42 AVE	43 AVE	124	LOC	6.6	20.8	27.4	0.0	2	5.01	66.4	75.0
Ana-1410-020	71 ST	124	272	43 AVE	North End	148	LOC	4.0	20.8	24.8	0.0	2	4.76	73.2	75.2
Ana-1410-030	71 ST	273	367	49A AVE	50 AVE	94	LOC	0.3	1.1	1.4	0.0	1	1.91	94.9	98.6
Ana-1410-040	71 ST	367	459	50 AVE	51 AVE	92	LOC	0.0	4.0	4.0	0.0	3		93.8	96.0
Ana-1420-010	71 ST CL	0	64	South End	38 AVE	64	LOC	5.2	10.6	15.7	0.0	2	4.26	66.0	84.2
Ana-1420-020	71 ST CL	65	168	South End	46 AVE	103	LOC	7.2	37.1	44.3	0.0	2	5.60	59.4	75.0
Ana-1430-010	72 ST	1	107	42 AVE	43 AVE	106	LOC	11.3	29.7	41.0	0.0	1	4.83	60.3	75.0
Ana-1430-020	72 ST	108	167	43 AVE	North End	59	LOC	2.9	12.4	15.2	0.0	2		70.2	84.2
Ana-1440-010	72 ST CL	0	23	South End	38 AVE	23	LOC	0.0	0.0	0.0	0.0	3		100	100.0
Ana-1450-010	73 ST	0	130	MARLER DR	42 AVE CL	130	COL	2.0	9.6	11.6	0.0	2	2.83	82.8	88.4
Ana-1450-020	73 ST	130	237	42 AVE CL	43 AVE	107	COL	3.3	17.9	21.2	0.0	2	2.83	69.9	78.8
Ana-1450-030	73 ST	237	381	43 AVE	44 AVE / 44 AVE CL	144	COL	5.9	18.4	24.3	0.0	2	3.97	69.5	73.5
Ana-1450-040	73 ST	381	467	44 AVE / 44 AVE CL	44A AVE CL	86	COL	0.0	1.5	1.5	0.0	1	3.15	98.0	98.5
Ana-1450-050	73 ST	467	591	44A AVE CL	44B AVE	124	COL	0.0	0.0	0.0	0.0	3	3.19	100	100.0
Ana-1450-060	73 ST	591	692	44B AVE	45 AVE	101	COL	1.0	7.6	8.6	0.2	3	2.44	85.1	91.3
Ana-1450-070	73 ST	692	814	45 AVE	46 AVE	122	COL	4.3	23.0	27.3	0.5	5	4.76	54.2	74.0
Ana-1450-080	73 ST	814	1157	46 AVE	48 AVE	343	COL	6.1	8.7	14.8	0.2	4	4.15	66.1	72.6
Ana-1450-090	73 ST	1157	1483	48 AVE	North End	326	COL	5.9	21.5	27.5	0.8	5	5.58	46.6	70.7
Ana-1460-010	73A ST	0	104	45 AVE	46 AVE	104	LOC	2.3	4.5	6.8	0.0	2	5.47	80.7	93.2
Ana-1470-010	74 ST	0	79	NO NAME	43 AVE	79	LOC	1.4	3.1	4.5	0.0	1		88.1	95.5
Ana-1470-020	74 ST	79	148	43 AVE	North End	69	LOC	0.0	4.8	4.8	0.0	2	5.43	93.6	95.2
Ana-1470-030	74 ST	149	374	44 AVE	44B AVE	225	LOC	0.0	0.0	0.0	0.2	2	4.06	99.1	100.0
Ana-1470-040	74 ST	375	478	45 AVE	46 AVE	103	LOC	0.3	0.6	0.9	0.0	2	3.33	95.8	99.1
Ana-1480-010	75 ST	0	83	38 AVE / MARLER DR	37A AVE	83	COL	3.9	25.9	29.9	0.0	2	5.60	66.8	74.0
Ana-1480-020	75 ST	83	162	37A AVE	38A AVE	79	COL	7.9	27.5	35.3	0.0	2	6.24	61.6	73.0
Ana-1480-030	75 ST	162	251	38A AVE	39 AVE	89	COL	6.8	26.5	33.3	0.0	2	4.02	63.3	73.3
Ana-1480-040	75 ST	251	339	39 AVE	40 AVE	88	COL	4.8	25.0	29.8	0.0	2	3.61	65.7	73.8
Ana-1480-050	75 ST	339	436	40 AVE	41 AVE	97	COL	3.8	11.0	14.8	0.0	2	4.60	77.0	74.0
Ana-1480-060	75 ST	436	549	41 AVE	42 AVE	113	COL	5.4	35.5	40.9	0.0	2	4.73	63.8	73.6
Ana-1480-070	75 ST	549	715	42 AVE	43 AVE	166	COL	6.4	21.9	28.3	0.0	2	4.40	66.1	73.4
Ana-1480-080	75 ST	715	825	43 AVE	North End	110	LOC	4.6	15.8	20.4	0.6	5		65.3	78.8
Ana-1480-090	75 ST	826	1051	44 AVE	44B AVE	225	LOC	0.1	0.0	0.1	0.0	2	4.50	96.6	99.9
Ana-1480-100	75 ST	1052	1155	45 AVE	46 AVE	103	LOC	0.0	0.1	0.1	0.0	2	5.74	100	99.9
Ana-1490-010	76 ST	0	75	37A AVE	38A AVE	75	LOC	1.2	6.6	7.9	0.0	2	7.71	83.4	92.1
Ana-1490-020	76 ST	76	165	39 AVE	40 AVE	89	LOC	5.2	12.9	18.2	0.0	2	7.24	69.9	81.8
Ana-1500-010	ARENA PARKING LOT ACCESS RD	0	140	44 AVE	45 AVE	140	LOC	0.0	1.1	1.1	0.0	2	3.32	96.5	98.9
Ana-1510-010	AUGUSTANA DORMES	1	546	50 ST	South End	545	LOC	1.7	2.4	4.1	0.1	2	3.05	86.1	95.4
Ana-1520-010	AUGUSTANA S	0	161	South End	46 AVE	161	LOC	4.6	5.6	10.2	0.2	6	3.90	59.1	88.2
Ana-1530-010	BLANK_1	1	131	NO NAME	45 AVE	130	LOC	0.0	0.8	0.8	0.3	4	9.78	96.1	99.2
Ana-1540-010	CAMROSE DR	0	117	68 ST / RGE RD 204	NO NAME	117	ART	0.0	0.4	0.4	0.0	3	2.57	99.3	99.6
Ana-1540-020	CAMROSE DR	117	585	NO NAME	62 ST	468	ART	0.2	0.8	1.0	0.0	4	2.31	95.2	98.9
Ana-1540-030	CAMROSE DR	585	1233	62 ST	PARKVIEW DR SB / VALLEYVIEW DR SB	648	ART	0.1	0.6	0.7	0.2	5	2.36	84.7	99.2
Ana-1540-040	CAMROSE DR	1233	2436	PARKVIEW DR SB / VALLEYVIEW DR SB	50 ST	1203	ART	0.1	1.2	1.3	0.1	8	2.04	67.2	98.6
Ana-1540-050	CAMROSE DR	2437	2598	50 ST / NO NAME	NO NAME	161	ART	0.1	0.2	0.2	0.0	7	2.39	74.9	99.7
Ana-1540-060	CAMROSE DR	2598	3343	NO NAME	NO NAME	745	ART	0.1	0.2	0.3	1.6	6	1.95	65.4	99.6
Ana-1540-070	CAMROSE DR	3343	3574	NO NAME	39 ST (NEW SALEM RD) / NO NAME	231	ART	0.1	0.0	0.1	0.0	4	2.08	97.1	99.8
Ana-1540-080	CAMROSE DR	3575	4971	39 ST / 39 ST (NEW SALEM RD) / NO NAME	EXHIBITION DR / GRAVEL PIT RD	1396	ART	8.3	8.2	16.6	0.1	5	2.03	58.3	82.8
Ana-1540-090	CAMROSE DR	4971	5275	EXHIBITION DR / GRAVEL PIT RD	NO NAME	304	ART	7.0	9.1	16.2	0.0	5	1.98	63.1	83.7
Ana-1540-100	CAMROSE DR	5275	5772	NO NAME	HIGHWAY 13	497	ART	7.8	12.9	20.7	0.1	4	2.11	57.8	78.3
Ana-1550-010	COMP RD	0	476	45 AVE	S 48TH AVE SERVICE RD	476	COL	13.6	18.2	31.8	18.6	5	4.18	21.0	69.1
Ana-1550-020	COMP RD	476	507	S 48TH AVE SERVICE RD	48 AVE WB	31	COL	9.5	11.3	20.8	3.0	4		26.6	73.4
Ana-1560-010	DRIED MEAT LAKE RD	0	161	Southeast End	NO NAME	161	ART	1.6	2.0	3.6	0.3	3	4.70	77.0	74.3
Ana-1560-020	DRIED MEAT LAKE RD	161	201	NO NAME	NO NAME	40	ART	0.0	0.0	0.0	0.0	3	2.64	99.8	100.0
Ana-1560-030	DRIED MEAT LAKE RD	201	336	NO NAME	HIGHWAY 13	135	ART	0.8	3.0	3.9	0.0	5	3.48	78.8	96.1
Ana-1580-010	EAST END 2	0	74	Southwest End	48 AVE	74	LOC	0.0	0.6	0.6	0.0	2	2.65	99.0	99.4
Ana-1590-010	EAST END 3	0	75	Southwest End	48 AVE	75	LOC	3.4	5.3	8.7	3.4	5		59.8	89.9
Ana-1600-010	EDGEWOOD DR	0	231	ENEVOLD DR	300 EDGEWOOD CL / 400 EDGEWOOD CL	231	LOC	1.8	7.9	9.7	0.0	2	3.69	84.3	90.3
Ana-1600-020	EDGEWOOD DR	231	467	300 EDGEWOOD CL / 400 EDGEWOOD CL	200 EDGEWOOD CL	236	LOC	5.4	12.5	17.8	0.0	2	3.05	71.1	82.2
Ana-1600-030	EDGEWOOD DR	467	549	200 EDGEWOOD CL	100 EDGEWOOD CL	82	LOC	0.8	3.9	4.8	0.0	2	3.65	88.3	95.2
Ana-1600-040	EDGEWOOD DR	549	646	100 EDGEWOOD CL	ENEVOLD DR	97	LOC	1.5	3.1	4.6	1.1	2	2.11	79.0	95.0
Ana-1610-010	ELLIOTT DR	0	95	ENEVOLD DR / ERICKSON DR	35 AVE	95	COL	5.6	2.5	8.2	0.3	3	6.24	71.2	73.7
Ana-1610-020	ELLIOTT DR	95	344	35 AVE	32 AVE	249	COL	12.6	6.0	18.6	0.0	2	4.90	70.2	70.9
Ana-1610-030	ELLIOTT DR	344	419	32 AVE	31 AVE	75	COL	0.1	0.2	0.4	0.0	1	3.87	90.5	74.9
Ana-1610-040	ELLIOTT DR	419	604	31 AVE	63 ST / 63 ST CL	185	COL	2.8	9.3	12.1	0.0	1	3.63	73.5	74.3
Ana-1610-050	ELLIOTT DR	604	687	63 ST / 63 ST CL	62A ST	83	COL	4.8	19.9	24.8	0.2	2	3.66	64.8	73.5
Ana-1610-060	ELLIOTT DR	687	814	62A ST	32 AVE	127	COL	3.7	21.3	25.0	0.1	2	4.91	68.3	74.0
Ana-1610-070	ELLIOTT DR	815	908	32 AVE	ENEVOLD DR	93	COL	2.8	12.8	15.6	0.2	2	3.92	75.2	74.3
Ana-1620-010	ENEVOLD DR	0	46	68 ST	NO NAME	46	COL	0.0	0.6	0.6	0.0	2	7.56	98.9	75.0
Ana-1620-020	ENEVOLD DR	46	105	NO NAME	66A ST	59	COL	0.9	2.0	2.9	0.0	2	3.49	87.6	97.1
Ana-1620-030	ENEVOLD DR	105	271	66A ST	ELLIOTT DR / ERICKSON DR	166	COL	0.6	2.9	3.5	0.0	2	3.03	92.0	96.5
Ana-1620-040	ENEVOLD DR	271	362	ELLIOTT DR / ERICKSON DR	64 ST CL	91	COL	1.0	10.8	11.8	0.0	4	2.58	79.9	88.2
Ana-1620-050	ENEVOLD DR	362	655	64 ST CL	62A ST	293	COL	2.8	7.3	10.1	0.0	2	2.16	78.8	89.9
Ana-1620-060	ENEVOLD DR	655	714	62A ST	ELLIOTT DR / ERICKSON DR	59	COL	0.2	5.8	6.0	0.0	2	2.98	90.9	94.0
Ana-1620-070	ENEVOLD DR	714	893	ELLIOTT DR / ERICKSON DR	61A ST	179	COL	1.0	9.6	10.6	0.3	2	2.75	81.7	89.4
Ana-1620-080	ENEVOLD DR	893	985	61A ST	59 ST CL / EDGEWOOD DR	92	COL	1.0	36.3	37.3	0.1	4	4.07	70.6	74.7
Ana-1620-090	ENEVOLD DR	985	1076	59 ST CL / EDGEWOOD DR	58 ST CL	91	COL	1.2	58.1	59.3	0.0	5	3.20	64.1	75.0
Ana-1620-100	ENEVOLD DR	1076	1151	58 ST CL	57 ST	75	COL	1.2	57.8	59.0	0.0	3	2.95	60.7	74.9
Ana-1620-110	ENEVOLD DR	1151	1284	57 ST	EDGEWOOD DR	133	COL	2.3	31.6	34.0	0.0	3	2.21	67.5	75.0
Ana-1620-120	ENEVOLD DR	1284	1401	EDGEWOOD DR	PARKRIDGE DR_1 / PARKVIEW DR SB	117	COL	5.1	20.2	25.3	0.0	3	1.89	59.8	74.5
Ana-1630-010	ERICKSON DR	0	109	ELLIOTT DR / ENEVOLD DR	37 AVE	109	COL	6.8	36.4	43.2	0.3	3	7.60	57.2	73.2

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-1630-020	ERICKSON DR	109	250	37 AVE	63 ST / 63 ST CL	141	COL	25.5	68.0	93.5	1.5	4	4.69	21.5	67.1
Ana-1630-030	ERICKSON DR	250	347	63 ST / 63 ST CL	62 ST	97	COL	29.8	85.0	100.0	1.4	3	7.86	27.7	66.6
Ana-1630-040	ERICKSON DR	347	666	62 ST	36 AVE	319	COL	12.6	33.2	45.8	0.0	2	3.24	60.6	75.0
Ana-1630-050	ERICKSON DR	666	746	36 AVE	35 AVE	80	COL	3.0	6.5	9.5	0.0	2	3.48	82.5	90.5
Ana-1630-060	ERICKSON DR	746	826	35 AVE	34 AVE	80	COL	0.0	0.1	0.1	0.0	2	3.35	100	99.9
Ana-1630-070	ERICKSON DR	826	913	34 AVE	ENEVOLD DR	87	COL	0.0	0.3	0.3	0.0	2	3.49	100	99.7
Ana-1640-010	EXHIBITION DR	0	446	CAMROSE DR	NO NAME	446	ART	0.3	1.2	1.5	0.0	3	2.38	95.3	98.5
Ana-1640-020	EXHIBITION DR	446	492	NO NAME	NO NAME	46	ART	2.2	2.7	4.9	0.0	2	3.77	82.0	74.5
Ana-1640-030	EXHIBITION DR	492	716	NO NAME	48 AVE / HIGHWAY 13	224	ART	1.1	1.6	2.7	0.1	2	3.15	89.4	96.6
Ana-1650-010	GOLF COURSE	0	104	66 ST	East End	104	LOC	5.2	4.2	9.5	4.2	4	5.65	52.3	88.5
Ana-1660-010	GRAND DR	0	119	48 AVE WB	48A AVE / GRANDVIEW CRES	119	COL	0.0	1.4	1.4	1.2	2	3.67	93.7	75.0
Ana-1660-020	GRAND DR	119	213	48A AVE / GRANDVIEW CRES	48B AVE / GRANDVIEW CRES	94	COL	0.0	0.0	0.0	0.0	2	1.92	100	100.0
Ana-1660-030	GRAND DR	213	308	48B AVE / GRANDVIEW CRES	49 AVE	95	COL	0.0	0.0	0.0	0.0	2	1.85	100	100.0
Ana-1660-040	GRAND DR	308	367	49 AVE	GRAND PARK CRES	59	COL	0.0	0.0	0.0	0.0	2	1.96	100	100.0
Ana-1660-050	GRAND DR	367	933	GRAND PARK CRES	50 AVE / 58 ST	566	COL	0.0	0.2	0.2	0.0	2	2.08	99.3	99.8
Ana-1670-010	GRAND PARK CRES	0	172	48 AVE	48B AVE	172	LOC	0.0	0.9	0.9	0.0	2	3.13	99.1	99.1
Ana-1670-020	GRAND PARK CRES	172	470	48B AVE	GRAND DR	298	LOC	0.4	0.8	1.2	0.0	2	2.81	91.8	98.6
Ana-1680-010	GRANDVIEW CRES	0	330	48A AVE / GRAND DR	48B AVE / GRAND DR	330	LOC	16.1	11.9	28.0	6.8	6	9.51	39.7	68.0
Ana-1690-010	HIGHWAY 13	0	153	48 AVE / EXHIBITION DR	NO NAME	153	ART	29.5	4.1	33.5	0.6	3	2.10	45.0	74.0
Ana-1690-020	HIGHWAY 13	153	496	NO NAME	48 AVE WB	343	ART	23.3	5.6	28.9	0.7	3	2.22	37.6	72.9
Ana-1690-030	HIGHWAY 13	496	833	48 AVE WB	CAMROSE DR	337	ART	8.2	6.1	14.3	2.3	4	1.85	49.3	81.4
Ana-1690-040	HIGHWAY 13	833	886	CAMROSE DR	NO NAME	53	ART	33.2	19.1	52.3	3.6	8	2.38	10.3	59.5
Ana-1690-050	HIGHWAY 13	886	1934	NO NAME	DRIED MEAT LAKE RD	1048	ART	2.9	4.3	7.2	0.3	4	2.37	73.9	91.2
Ana-1690-060	HIGHWAY 13	1934	1965	DRIED MEAT LAKE RD	Southeast End	31	ART	15.3	11.8	27.1	2.1	6	2.25	18.0	67.2
Ana-1700-010	HIGHWAY 26	0	961	48 AVE WB	RGE RD 201	961	ART	7.0	8.0	15.0	7.8	6	2.28	40.6	81.1
Ana-1700-020	HIGHWAY 26	961	1202	RGE RD 201	RGE RD 200	241	ART	2.6	6.4	9.1	2.9	4	1.88	58.9	89.6
Ana-1700-030	HIGHWAY 26	1202	1773	RGE RD 200	East End	571	ART	4.6	9.5	14.0	8.0	5	2.09	42.5	83.3
Ana-1710-010	MARLER DR	0	60	South End	38 AVE / 75 ST	60	COL	5.0	23.6	28.6	0.0	2		65.7	75.0
Ana-1710-020	MARLER DR	60	132	38 AVE / 75 ST	North End	72	COL	0.0	2.7	2.7	0.0	5	2.86	76.3	97.3
Ana-1710-030	MARLER DR	133	259	41 AVE	73 ST	126	COL	6.0	22.1	28.1	0.0	2	3.56	66.0	73.5
Ana-1710-040	MARLER DR	259	501	73 ST	69A ST CL	242	COL	1.8	18.3	20.2	0.0	2	2.38	75.2	79.8
Ana-1710-050	MARLER DR	501	559	69A ST CL	69 ST	58	COL	4.8	9.4	14.3	1.6	2	3.85	70.6	73.2
Ana-1710-060	MARLER DR	559	680	69 ST	NO NAME	121	COL	8.7	22.4	31.1	3.4	3	5.77	42.7	72.7
Ana-1710-070	MARLER DR	680	749	NO NAME	68 ST	69	COL	5.5	16.8	22.2	3.6	5	7.21	46.2	73.5
Ana-1710-080	MARLER DR	749	927	68 ST	67 ST	178	COL	5.3	18.0	23.3	8.6	6	5.59	39.7	73.8
Ana-1710-090	MARLER DR	927	1092	67 ST	65 ST	165	COL	10.4	31.7	42.1	8.3	5	4.54	26.1	72.2
Ana-1710-100	MARLER DR	1092	1344	65 ST	63 ST	252	COL	4.0	25.2	29.2	5.8	5	3.21	50.0	74.5
Ana-1710-110	MARLER DR	1344	1670	63 ST	MOUNT PLEASANT DR	326	COL	5.4	28.4	33.7	8.1	4	2.68	43.3	73.7
Ana-1710-120	MARLER DR	1670	1810	MOUNT PLEASANT DR	59 ST CL	140	COL	10.3	18.6	28.9	2.7	4	2.85	39.6	73.0
Ana-1710-130	MARLER DR	1810	1873	59 ST CL	59 ST	63	COL	21.4	26.0	47.4	2.7	4	2.85	25.7	69.0
Ana-1710-140	MARLER DR	1873	2125	59 ST	57 ST	252	COL	20.9	30.4	51.3	4.7	3	2.78	26.1	69.5
Ana-1710-150	MARLER DR	2125	2182	57 ST	42 AVE	57	COL	7.9	21.9	29.8	11.2	4	4.31	36.0	73.2
Ana-1710-160	MARLER DR	2182	2282	42 AVE	43 AVE	100	COL	17.5	40.2	57.7	10.3	4	3.96	15.9	70.3
Ana-1710-170	MARLER DR	2282	2375	43 AVE	PARKVIEW DR	93	COL	8.5	14.2	22.7	1.0	3	3.64	55.1	71.5
Ana-1720-010	MONTCALM AVE	0	91	MOUNT PLEASANT DR	MONTROSE AVE	91	LOC	2.5	7.9	10.5	0.0	2	3.56	68.8	88.8
Ana-1720-020	MONTCALM AVE	91	584	MONTROSE AVE	MOUNT PLEASANT DR	493	LOC	7.5	16.3	23.8	1.0	3	5.43	53.5	74.8
Ana-1730-010	MONTCLARE AVE	0	324	MOUNT PLEASANT DR	47 AVE	324	LOC	9.7	20.2	29.9	0.6	3	3.69	53.8	73.6
Ana-1740-010	MONTJOY AVE	0	303	61 ST	47 AVE	303	LOC	2.2	11.0	13.3	0.6	3	5.45	75.7	86.5
Ana-1750-010	MONTROSE AVE	0	88	MONTCALM AVE	MONTROSE AVE_1	88	LOC	6.9	14.8	21.7	0.6	5	5.38	50.0	76.5
Ana-1750-020	MONTROSE AVE	88	140	MONTROSE AVE_1	MONTROSE AVE_1	52	LOC	1.9	15.6	17.5	0.7	5	7.58	73.1	82.2
Ana-1760-010	MONTROSE AVE_1	0	135	MONTROSE AVE	MONTROSE AVE	135	LOC	5.8	33.5	39.3	0.5	5	8.45	51.2	74.3
Ana-1760-020	MONTROSE AVE_1	135	225	MONTROSE AVE	MOUNT PLEASANT DR	90	LOC	7.3	26.0	33.3	0.2	3	6.12	36.7	72.9
Ana-1770-010	MOUNT PLEASANT DR	0	312	East End	58 ST	312	COL	0.1	0.2	0.4	0.0	1	2.70	98.4	99.6
Ana-1770-020	MOUNT PLEASANT DR	312	586	58 ST	39 AVE	274	COL	10.0	16.3	26.2	4.7	4	6.87	37.9	70.6
Ana-1770-030	MOUNT PLEASANT DR	586	686	39 AVE	MARLER DR	100	COL	3.5	7.3	10.8	2.4	5	9.23	59.7	73.7
Ana-1770-040	MOUNT PLEASANT DR	686	914	MARLER DR	42 AVE	228	COL	2.9	13.8	16.7	1.3	2	3.31	62.3	82.0
Ana-1770-050	MOUNT PLEASANT DR	914	1108	42 AVE	43 AVE	194	COL	1.4	8.5	9.9	0.2	1	2.81	77.4	89.9
Ana-1770-060	MOUNT PLEASANT DR	1108	1205	43 AVE	44 AVE	97	COL	1.8	11.0	12.8	0.0	2	3.35	78.2	87.2
Ana-1770-070	MOUNT PLEASANT DR	1205	1299	44 AVE	MONTCALM AVE	94	COL	3.2	12.8	15.9	0.3	2	2.13	66.3	83.9
Ana-1770-080	MOUNT PLEASANT DR	1299	1497	MONTCALM AVE	MONTROSE AVE_1	198	COL	4.1	19.3	23.5	0.0	2	2.80	67.8	76.5
Ana-1770-090	MOUNT PLEASANT DR	1497	1548	MONTROSE AVE_1	45 AVE	51	COL	3.4	25.3	28.7	0.5	3	3.67	66.3	74.3
Ana-1770-100	MOUNT PLEASANT DR	1548	1804	45 AVE	MONTCLARE AVE	256	COL	3.5	13.1	16.5	0.1	3	3.10	73.9	83.5
Ana-1770-110	MOUNT PLEASANT DR	1804	1951	MONTCLARE AVE	47 AVE	147	COL	4.7	16.0	20.6	0.0	3	3.02	66.9	79.1
Ana-1770-120	MOUNT PLEASANT DR	1951	2048	47 AVE	47A AVE	97	COL	7.6	31.0	38.6	0.5	2	4.03	55.7	73.0
Ana-1770-130	MOUNT PLEASANT DR	2048	2158	47A AVE	48 AVE WB	110	COL	4.4	12.5	16.9	0.0	5	2.29	60.7	82.7
Ana-1780-010	N 48 AVE SERVICE RD	0	247	West End	64 ST	247	LOC	7.1	12.4	19.5	11.6	5	5.03	50.7	78.1
Ana-1780-020	N 48 AVE SERVICE RD	247	447	64 ST	East End	200	LOC	8.4	10.5	19.0	6.6	6	5.75	40.5	77.4
Ana-1780-030	N 48 AVE SERVICE RD	448	921	39 ST	HIGHWAY 26	473	LOC	18.6	52.2	70.8	4.3	4	3.35	27.3	70.0
Ana-1790-010	PARKRIDGE DR	0	149	600 PARKRIDGE CL / PARKRIDGE DR_1	500 PARKRIDGE CL	149	LOC	4.7	10.3	15.0	0.0	2	4.71	73.6	84.7
Ana-1790-020	PARKRIDGE DR	149	331	500 PARKRIDGE CL	400 PARKRIDGE CL	182	LOC	4.2	14.6	18.8	0.1	2	3.74	73.2	81.2
Ana-1790-030	PARKRIDGE DR	331	434	400 PARKRIDGE CL	300 PARKRIDGE CL	103	LOC	4.7	14.6	19.2	0.0	2	4.19	70.8	80.8
Ana-1790-040	PARKRIDGE DR	434	528	300 PARKRIDGE CL	200 PARKRIDGE CL / PARKRIDGE DR_1	94	LOC	3.0	14.8	17.8	0.3	3	5.28	72.4	82.2
Ana-1790-050	PARKRIDGE DR	528	782	200 PARKRIDGE CL / PARKRIDGE DR_1	100 PARKRIDGE CL	254	COL	2.7	11.6	14.3	0.0	2	5.29	76.5	74.3
Ana-1790-060	PARKRIDGE DR	782	856	100 PARKRIDGE CL	PARKVIEW DR	74	COL	1.8	12.0	13.8	0.4	3	9.54	76.0	74.6
Ana-1800-010	PARKRIDGE DR_1	0	68	ENEVOLD DR / PARKVIEW DR	600 PARKRIDGE CL / PARKRIDGE DR	68	COL	9.8	35.9	45.7	1.0	5	8.02	27.6	71.1
Ana-1800-020	PARKRIDGE DR_1	68	206	600 PARKRIDGE CL / PARKRIDGE DR	200 PARKRIDGE CL / PARKRIDGE DR	138	COL	5.1	21.1	26.2	2.2	4	7.73	53.0	73.7
Ana-1810-010	PARKVIEW DR	1	263	CAMROSE DR / NO NAME	PARKRIDGE DR_1	262	ART	0.7	1.8	2.5	1.3	3	1.77	80.3	83.4
Ana-1810-020	PARKVIEW DR	264	566	ENEVOLD DR / PARKRIDGE DR_1	PARKRIDGE DR	302	ART	0.2	1.3	1.5	4.6	2	1.63	70.4	84.6
Ana-1810-030	PARKVIEW DR	566	1031	PARKRIDGE DR	39 AVE	465	ART	0.5	0.9	1.4	2.1	3	1.99	80.8	83.5
Ana-1810-040	PARKVIEW DR	1031	1193	39 AVE	MARLER DR	162	ART	6.7	6.9	13.6	3.0	4	2.66	48.0	68.2
Ana-1810-050	PARKVIEW DR	1193	1280	MARLER DR	55 ST	87	ART	0.0	0.5	0.5	3.0	1	2.10	79.4	84.3
Ana-1810-060	PARKVIEW DR	1280	1318	55 ST	53 ST	38	ART	0.0	0.3	0.3	5.5	2	1.99	75.8	98.6
Ana-1820-010	PARKVIEW DR SB	0	264	CAMROSE DR / VALLEYVIEW DR SB / NO NAME	ENEVOLD DR	264	ART	2.1	1.6	3.7	1.1	3	1.93	70.6	86.4
Ana-1830-010	R SERVICE RD GRAND PARK CRES 48A	1	217	48 AVE WB	GRAND PARK CRES	216	LOC	0.0	0.0	0.0	0.0	4	2.57	100	100.0
Ana-1840-010	S 48TH AVE SERVICE RD	0	449	65 ST	COMP RD	449	LOC	32.2	23.8	56.0	8.6	5	5.31	17.9	61.2
Ana-1840-020	S 48TH AVE SERVICE RD	450	724	48 AVE	48 AVE	274	LOC	31.1	23.3	54.4	10.5	4	5.33	16.9	61.2
Ana-1840-030	S 48TH AVE SERVICE RD	725	1020	48 AVE	48 AVE	295	LOC	46.4	29.5	75.9	12.2	6	8.24	10.7	55.5
Ana-1840-040	S 48TH AVE SERVICE RD	1021	1326	39 ST	38 ST	305	LOC	22.7	10.3	33.0	5.0	7	4.32	38.3	64.2
Ana-1840-050	S 48TH AVE SERVICE RD	1326	1455	38 ST	Southeast End	129	LOC	18.3	9.1	27.5	3.1	7	6.40	42.9	67.2
Ana-1840-060	S 48TH AVE SERVICE RD	1456	1783	48 AVE	37 ST	327	LOC	4.2	5.6	9.8	0.6	2	2.84	77.9	88.8
Ana-1840-070	S 48TH AVE SERVICE RD	1783	1999	37 ST	36 ST / NO NAME	216	LOC	0.2	2.0	2.2	0.0	2	3.34	93.3	97.8
Ana-1850-010	SOUTH CAMPUS RD	1	236	50 ST	NO NAME	235	LOC	15.9	9.3	25.2	8.8	6	9.50	46.3	67.4
Ana-1860-010	VALLEYVIEW DR	0	150	62 ST	59 ST	150	COL	0.0	0.0	0.0	0.0	3	3.53	100.0	75.0
Ana-1860-020	VALLEYVIEW DR	150	531	59 ST	25 AVE	381	COL	0.0	0.2	0.2	0.0	3	3.15	99.6	99.8
Ana-1860-030	VALLEYVIEW DR	531	724	25 AVE	28 AVE	193	COL	0.7	0.8	1.5	0.5	3	3.32	93.1	98.1
Ana-1860-040	VALLEYVIEW DR	724	861	28 AVE	CAMROSE DR	137	COL	1.6	5.1	6.8	0.7	4	5.12	76.4	74.2
Ana-1870-010	VALLEYVIEW DR SB	0	154	62 ST	24 AVE CL_1	154	COL	0.0	0.1	0.1	0.2	3	3.52	98.1	75.0
Ana-1870-020	VALLEYVIEW DR SB	154	716	24 AVE CL_1	28 AVE	562	COL	0.2	0.3	0.4	0.1	3	3.18	95.2	99.5
Ana-1870-030	VALLEYVIEW DR SB	716	847	28 AVE	CAMROSE DR / PARKVIEW DR SB	131	COL	2.7	2.8	5.4	0.4	4	4.71	70.3	73.9
Ana-1880-010	WT BUILDING RD	0	333	Northwest End	WT BUILDING RD ACCESS	333	LOC	15.9	29.7	45.5	4.8	4	4.92	32.1	71.8

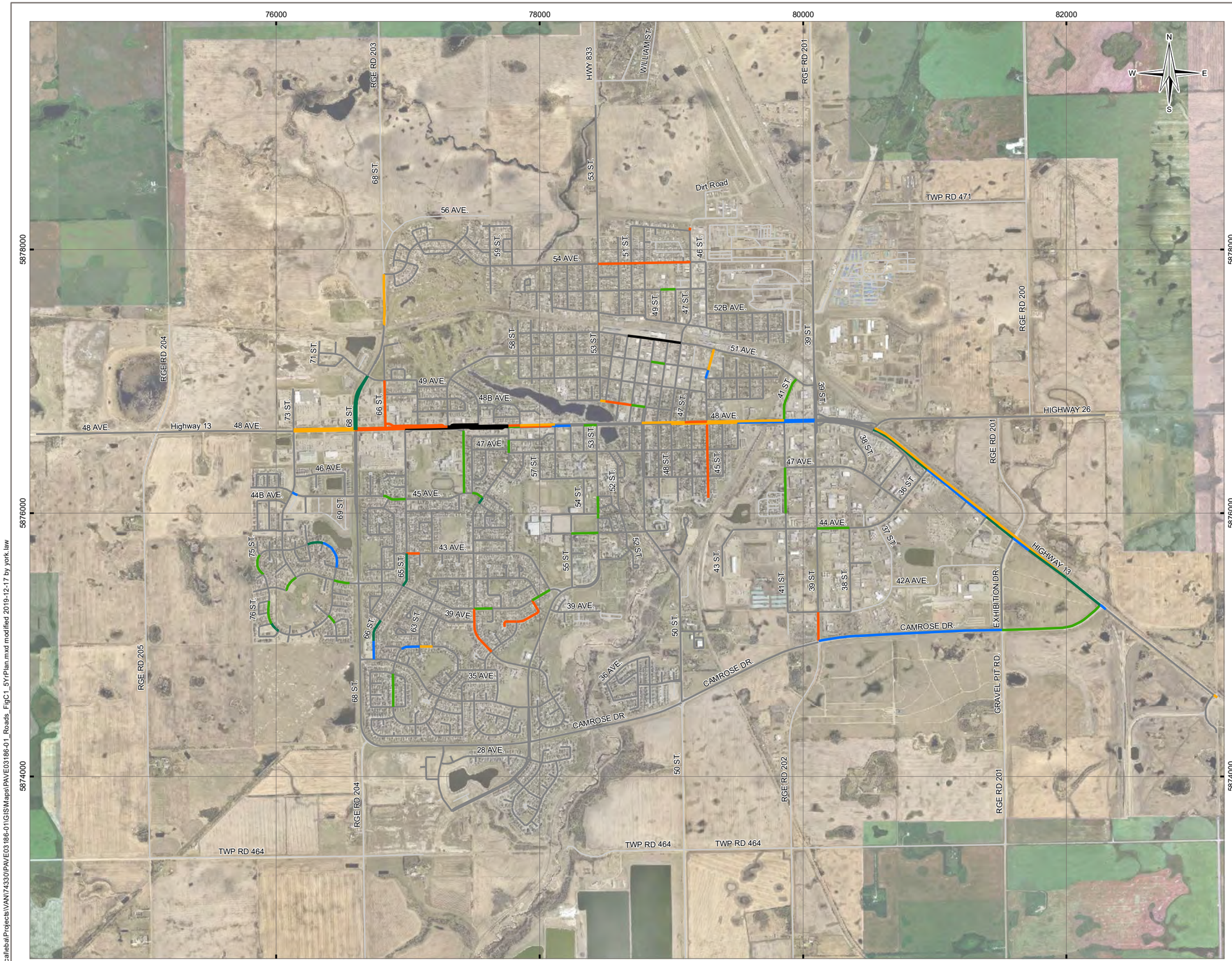
ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Class	AFCA (%)	TCA (%)	ACA (%)	RVH (%)	RUT (mm)	IRI (mm/m)	PCI	PAVI
Ana-1890-010	WT BUILDING RD ACCESS	1	103	50 ST	WT BUILDING RD	102	LOC	10.5	33.4	43.9	3.5	5	5.55	26.3	71.6
Ana-1890-020	WT BUILDING RD ACCESS	103	168	WT BUILDING RD	East End	65	LOC	21.7	24.4	46.1	3.1	8	4.89	21.9	68.0

APPENDIX C

REHABILITATION PROGRAM

GIS Map – Five Year Paving Plan ($2 million per year)

Rehabilitation Program Spreadsheet ($2 million per year)



LEGEND

5 Year Paving Plan

- 2019 (Completed after Data Collection)
- 2020
- 2021
- 2022
- 2023
- 2024
- No Treatment (2019-2024)
- Other Road - No Collection



NOTES
Base data source:
Imagery from ESRI Basemaps via
City of Camrose, 2015.

STATUS
ISSUED FOR USE

CITY OF CAMROSE
PAVEMENT CONDITION ASSESSMENT

5 Year Paving Plan for Paved Roadways ($2 Million Annual Budget)

PROJECTION 3TM 114	**DATUM** NAD83			**CLIENT** CITY OF Camrose
Scale: 1:28,000 0.4 0.2 0 0.4 Kilometres				TETRA TECH
FILE NO. PAVE03186-01_Roads_FigC1_5YrPlan.mxd				
OFFICE Tt-VANC	**DWN** YL	**CKD** KR	**APVD** KR	**REV** 1
DATE December 17, 2019	**PROJECT NO.** TRN.PAVE03186-01			**Figure C1**

\\tt.localeba\Projects\VAN\74330\PAVE03186-01\GIS\Maps\PAVE03186-01_Roads_FigC1_5YrPlan.mxd modified 2019-12-17 by york.law

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-0010-010	100 EDGEWOOD CL	0	91	West End	100 EDGEWOOD CL_1	91	14.4	LOC	Y			
Ana-0010-020	100 EDGEWOOD CL	91	186	100 EDGEWOOD CL_1	EDGEWOOD DR	95	9.6	LOC	Y			
Ana-0020-010	100 EDGEWOOD CL_1	0	62	South End	100 EDGEWOOD CL	62	15.9	LOC	Y			
Ana-0030-010	100 PARKRIDGE CL	0	67	PARKRIDGE DR	Northeast End	67	19.4	LOC	Y			
Ana-0040-010	200 EDGEWOOD CL	0	158	EDGEWOOD DR	Northeast End	158	14.3	LOC	Y			
Ana-0050-010	200 PARKRIDGE CL	0	56	PARKRIDGE DR_1	Northeast End	56	16.5	LOC	Y			
Ana-0060-010	23 AVE	0	172	56 ST	57 ST	172	11.2	LOC	Y			
Ana-0070-010	23A AVE CL	1	63	56 ST	Southeast End	62	24.2	LOC	Y			
Ana-0080-010	24 AVE CL	137	213	West End	57 ST	76	17.7	LOC	Y			
Ana-0080-020	24 AVE CL	214	302	NO NAME	56 ST	88	20.2	LOC	Y			
Ana-0090-010	25 AVE	0	145	VALLEYVIEW DR		145	9.357242	LOC	Y			
Ana-0090-020	25 AVE	145	261		56 ST	116	10.3	LOC	Y			
Ana-0100-010	25 AVE_WB	0	64	25 AVE	VALLEYVIEW DR	64	7.8	LOC	Y			
Ana-0110-010	26 AVE	0	92	63 ST	62 ST	92	12.27	LOC	N			
Ana-0120-010	26 AVE CL	0	58	Northwest End	56 ST	58	15.2	LOC	Y			
Ana-0130-010	27 AVE	0	44	West End	63 ST	44	9.32	LOC	N			
Ana-0140-010	27 AVE CL	0	61	Northwest End	56 ST	61	15.8	LOC	Y			
Ana-0150-010	28 AVE	0	75	63 ST	East End	75	9.04	LOC	N			
Ana-0150-020	28 AVE	76	171	62 ST	61 ST CL	95	11.09	COL	Y			
Ana-0150-030	28 AVE	171	349	61 ST CL	60 ST CL	178	11.5	COL	Y			
Ana-0150-040	28 AVE	349	598	60 ST CL	59 ST CL	249	10.4	COL	Y			
Ana-0150-050	28 AVE	598	770	59 ST CL	VALLEYVIEW DR	172	13.7	COL	Y			
Ana-0150-070	28 AVE	770	860	VALLEYVIEW DR	57 ST	90	15.3	LOC	Y			
Ana-0150-080	28 AVE	860	968	57 ST	56 ST	108	11.6	LOC	Y			
Ana-0150-090	28 AVE	968	1079	56 ST	55 ST	111	11.2	LOC	Y			
Ana-0160-010	28A AVE CL	0	50	57 ST	East End	50	17.24	LOC	Y	MF50	2027	$25,860
Ana-0160-020	28A AVE CL	51	127	West End	55 ST	76	17.6	LOC	Y			
Ana-0170-010	30 AVE	0	154	67 ST	30 AVE_1	154	9.3	LOC	Y	FDM	2036	$78,771
Ana-0170-020	30 AVE	154	319	30 AVE_1	63 ST	165	9.2	LOC	Y			
Ana-0170-030	30 AVE	319	366	63 ST	East End	47	18.8617	LOC	Y			
Ana-0170-040	30 AVE	367	486	62A ST	62 ST CL	119	10	LOC	Y			
Ana-0170-050	30 AVE	486	577	62 ST CL	61A ST	91	9.8	LOC	Y			
Ana-0180-010	30 AVE_1	0	30	30 AVE	North End	30	43.6	LOC	Y			
Ana-0190-010	300 EDGEWOOD CL	0	56	Southwest End	400 EDGEWOOD CL / EDGEWOOD DR	56	20.4	LOC	Y	MF50	2027	$34,272
Ana-0200-010	300 PARKRIDGE CL	0	93	Southwest End	PARKRIDGE DR	93	12.6	LOC	Y	RECON	2035	$64,449
Ana-0210-010	31 AVE	0	89	67 ST	66 ST CL	89	11.2	LOC	Y			
Ana-0210-020	31 AVE	89	176	66 ST CL	ELLIOTT DR	87	9.4	LOC	Y			
Ana-0220-010	32 AVE	0	170	67 ST	ELLIOTT DR	170	10.1	LOC	Y			
Ana-0220-020	32 AVE	170	261	ELLIOTT DR	64 ST	91	10.8	LOC	Y			
Ana-0220-030	32 AVE	262	479	ELLIOTT DR	61A ST	217	9.4	LOC	Y			
Ana-0230-010	33 AVE	0	86	67 ST	East End	86	15.3	LOC	Y			
Ana-0230-020	33 AVE	87	156	West End	52 ST	69	14.6	LOC	Y			
Ana-0240-010	33A AVE	0	183	52B ST	52 ST	183	13.1	LOC	Y			
Ana-0250-010	34 AVE	1	89	67 ST	East End	88	14.9	LOC	Y	RECON	2025	$72,116
Ana-0250-020	34 AVE	90	160	Northwest End	ERICKSON DR	70	16.55714	LOC	Y	MF50	2035	$37,507
Ana-0250-030	34 AVE	161	252	52 ST	51 ST / 51 ST CL	91	11.3	COL	Y	MF50	2037	$41,149
Ana-0250-040	34 AVE	252	342	51 ST / 51 ST CL	50B ST CL / NO NAME	90	11.4	COL	Y	FDM	2039	$66,690
Ana-0250-050	34 AVE	342	411	50B ST CL / NO NAME	34 AVE_EB	69	13	COL	Y	MF50	2034	$33,492
Ana-0250-060	34 AVE	411	492	34 AVE_EB	50 ST	81	7.684616	COL	Y	MF50	2036	$19,899
Ana-0260-010	34 AVE_EB	0	80	34 AVE	50 ST	80	4.8	COL	Y	MF50	2032	$11,995
Ana-0270-010	35 AVE	0	174	67 ST	ELLIOTT DR	174	9.8	LOC	Y	RECON	2026	$93,786
Ana-0270-020	35 AVE	174	307	ELLIOTT DR	64 ST	133	9.4	LOC	Y	RECON	2028	$68,761
Ana-0270-030	35 AVE	308	377	Northwest End	ERICKSON DR	69	15.24348	LOC	Y	FDM	2036	$57,849
Ana-0270-040	35 AVE	378	607	61A ST	57 ST	229	8.9	LOC	Y			
Ana-0270-050	35 AVE	608	768	52A ST	52 ST	160	10	LOC	Y			
Ana-0280-010	36 AVE	0	207	ERICKSON DR	58 ST	207	10.5	LOC	Y	MF50	2027	$75,625
Ana-0280-020	36 AVE	207	297	58 ST	57 ST	90	12.5	LOC	Y	FDM	2039	$61,875
Ana-0280-030	36 AVE	298	418	Southwest End	52A ST	120	10	LOC	Y			
Ana-0280-040	36 AVE	418	626	52A ST	52 ST	208	10	LOC	Y			
Ana-0280-050	36 AVE	626	718	52 ST	51 ST	92	10	LOC	Y			
Ana-0290-010	36 ST	0	258	37 ST	47 AVE	258	12.2	COL	N			
Ana-0290-020	36 ST	258	500	47 AVE	NO NAME / S 48TH AVE SERVICE RD	242	12.32273	COL	N			
Ana-0290-030	36 ST	500	574	NO NAME / S 48TH AVE SERVICE RD	48 AVE	74	17.8	COL	Y			
Ana-0300-010	37 AVE	0	131	West End	ERICKSON DR	131	12.5	LOC	Y			
Ana-0310-010	37 AVE CL	0	61	NO NAME	58 ST	61	29.2	LOC	Y	RECON	2034	$97,966
Ana-0320-010	37 ST	989	1293	47 AVE	S 48TH AVE SERVICE RD	304	10.4	LOC	N			
Ana-0330-010	37A AVE	0	168	76 ST	75 ST	168	9.5	LOC	Y			
Ana-0330-020	37A AVE	169	261	West End	69 ST	92	11.74348	LOC	Y	MF50	2034	$33,860
Ana-0330-030	37A AVE	261	348	69 ST	68A ST	87	9.3	LOC	Y			
Ana-0340-010	38 AVE	0	93	75 ST / MARLER DR	72 ST CL	93	10.4	COL	Y			
Ana-0340-020	38 AVE	93	179	72 ST CL	71 ST CL	86	10.4	COL	Y			
Ana-0340-030	38 AVE	179	223	71 ST CL	70 ST	44	10.6	COL	Y			
Ana-0340-040	38 AVE	223	345	70 ST	69 ST / 69A ST CL	122	10.1	COL	Y	MF50	2036	$39,883
Ana-0340-050	38 AVE	346	456	69 ST	68A ST	110	12.2	LOC	Y			
Ana-0340-060	38 AVE	458	554	67 ST_1	65 ST / 66 ST	96	8.7	LOC	Y	RECON	2029	$45,936
Ana-0350-010	38 AVE CL	0	305	Southeast End	63 ST	305	13	LOC	Y	RECON	2031	$218,075
Ana-0350-020	38 AVE CL	306	397	NO NAME	58 ST	91	13.7	LOC	Y	RECON	2028	$68,568
Ana-0360-010	38 ST	0	366	37 ST / 42 AVE	43 AVE	366	10.2	LOC	N			
Ana-0360-020	38 ST	366	634	43 AVE	44 AVE	268	10	LOC	N	RCLM	2028	$147,400
Ana-0360-030	38 ST	635	1016	47 AVE	S 48TH AVE SERVICE RD	381	10.2	COL	N	OL50	2036	$154,925
Ana-0370-010	38A AVE	0	99	76 ST	75 ST	99	10.1	LOC	Y			
Ana-0380-010	39 AVE	0	75	76 ST	75 ST	75	10.5	LOC	Y			
Ana-0380-020	39 AVE	76	192	64 ST	63 ST	116	10.5	LOC	Y			
Ana-0380-030	39 AVE	192	290	63 ST	62 ST	98	9.1	LOC	Y			
Ana-0380-040	39 AVE	290	564	62 ST	MOUNT PLEASANT DR	274	8.9	LOC	Y			
Ana-0380-050	39 AVE	565	749	39 AVE CL / 58 ST	57 ST	184	11.1	LOC	Y	MF50	2020	$69,545
Ana-0380-060	39 AVE	750	811	PARKVIEW DR	56A ST CL	61	10.4	LOC	Y			
Ana-0380-070	39 AVE	811	862	56A ST CL	56 ST CL	51	10.3	LOC	Y			
Ana-0380-080	39 AVE	862	972	56 ST CL	NO NAME	110	11.3	LOC	Y			
Ana-0380-090	39 AVE	972	1134	NO NAME	East End	162	11.3	LOC	Y			
Ana-0390-010	39 AVE CL	0	117	69 ST	East End	117	11.02308	LOC	Y	RECON	2028	$70,934
Ana-0390-020	39 AVE CL	118	245	Southwest End	39 AVE / 58 ST	127	14.5	LOC	Y	FDM	2020	$101,283
Ana-0400-010	39 ST	0	219	39 ST (NEW SALEM RD) / CAMROSE DR / NO N	42 AVE	219	15.9	ART	N	OL50	2020	$139,438
Ana-0400-020	39 ST	219	854	42 AVE	44 AVE	635	9	ART	N	OL50	2031	$187,231
Ana-0400-030	39 ST	854	1320	44 AVE	47 AVE	466	10.00215	ART	N			
Ana-0400-040	39 ST	1320	1562	47 AVE	North End	242	11	ART	N	OL50	2030	$73,904
Ana-0400-050	39 ST	1563	1652	39 ST_SB	S 48TH AVE SERVICE RD	89	10.6	ART	N	OL50	2028	$26,461
Ana-0400-060	39 ST	1652	1673	S 48TH AVE SERVICE RD	North End	21	10.6	ART	N	OL50	2039	$6,528
Ana-0400-070	39 ST	1674	2035	48 AVE WB	North End	361	8.740167	ART	N	OL50	2028	$99,767
Ana-0400-080	39 ST	2036	2496	39 ST_SB	NO NAME	460	8.4	ART	N	OL50	2032	$127,131
Ana-0400-090	39 ST	2496	2710	NO NAME	NO NAME	214	8.4	ART	N	OL50	2032	$59,964
Ana-0400-100	39 ST	2710	2886	NO NAME	54 AVE	176	8.4	ART	N	OL50	2031	$49,574
Ana-0410-010	39 ST_SB	0	106	39 ST	North End	106	10	ART	N	OL50	2028	$34,331
Ana-0410-020	39 ST_SB	107	369	48 AVE WB	51 AVE	262	10.1	ART	N	OL50	2025	$93,661
Ana-0410-030	39 ST_SB	369	464	51 AVE	39 ST	95	5.8	ART	N	OL50	2029	$17,063
Ana-0420-010	40 AVE	0	79	76 ST	75 ST	79	10.4	LOC	Y			
Ana-0430-010	40 AVE CL	0	121	69 ST	East End	121	11.4	LOC	Y			
Ana-0440-010	400 EDGEWOOD CL	0	55	300 EDGEWOOD CL / EDGEWOOD DR	Northeast End	55	23	LOC	Y	MF50	2028	$38,994
Ana-0450-010	400 PARKRIDGE CL	0	43	PARKRIDGE DR	Southeast End	43	15.6	LOC	Y			
Ana-0460-010	41 AVE	0	117	West End	75 ST	117	15.3	COL	Y	MF50	2035	$57,228
Ana-0460-020	41 AVE	117	255	75 ST	MARLER DR	138	14.1	COL	Y	MF50	2026	$58,374
Ana-0460-030	41 AVE	256	351	42 AVE	63 ST	95	12.1	LOC	Y			
Ana-0460-040	41 AVE	352	443	60 ST	59 ST	91	14	LOC	Y	RECON	2032	$70,070
Ana-0460-050	41 AVE	444	702	Northeast End	42 AVE	258	9.7	LOC	Y	RECON	2026	$137,643
Ana-0470-010	41 ST	168	802	42 AVE	44 AVE	634	13.1	COL	N			
Ana-0470-020	41 ST	802	916	44 AVE	NO NAME	114	12.5	COL	N	FDM	2026	$92,625

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-0470-030	41 ST	916	1077	NO NAME	NO NAME	161	12.5	COL	N	RCLM	2024	$130,813
Ana-0470-040	41 ST	1077	1267	NO NAME	47 AVE	190	12.5	COL	N	OL50	2024	$91,330
Ana-0470-050	41 ST	1267	1613	47 AVE	48 AVE	346	13.3	COL	N	FDM	2039	$299,117
Ana-0470-060	41 ST	1614	1948	48 AVE WB	51 AVE	334	10	COL	N	OL50	2024	$88,939
Ana-0470-070	41 ST	1949	2053	52 AVE	52A AVE	104	10	LOC	Y			
Ana-0470-080	41 ST	2053	2180	52A AVE	52B AVE	127	11.1	LOC	Y			
Ana-0480-010	42 AVE	0	56	Southwest End	75 ST	56	16.8	LOC	Y			
Ana-0480-020	42 AVE	57	134	72 ST	71 ST	77	15.4	LOC	Y	RECON	2026	$65,219
Ana-0480-030	42 AVE	135	257	Northwest End	69 ST	122	15.4	LOC	Y			
Ana-0480-040	42 AVE	257	346	69 ST	East End	89	13.3	LOC	Y			
Ana-0480-050	42 AVE	347	447	West End	67 ST	100	12.026	LOC	Y	MF50	2034	$39,215
Ana-0480-060	42 AVE	447	539	67 ST	66 ST	92	9.4	LOC	Y			
Ana-0480-070	42 AVE	540	610	41 AVE	63 ST	70	13.2	LOC	Y			
Ana-0480-080	42 AVE	610	774	63 ST	62 ST	164	11	LOC	Y			
Ana-0480-090	42 AVE	774	883	62 ST	MOUNT PLEASANT DR	109	10.8	LOC	Y			
Ana-0480-100	42 AVE	883	989	MOUNT PLEASANT DR	60 ST / 60 ST CL	106	10.4	LOC	Y	RECON	2034	$60,632
Ana-0480-110	42 AVE	989	1129	60 ST / 60 ST CL	59 ST CL	140	10.4	LOC	Y	RECON	2029	$80,080
Ana-0480-120	42 AVE	1129	1230	59 ST CL	58 ST CL	101	10.1	LOC	Y	RECON	2030	$56,106
Ana-0480-130	42 AVE	1230	1347	58 ST CL	41 AVE	117	10.8	LOC	Y	RECON	2032	$69,498
Ana-0480-140	42 AVE	1347	1447	41 AVE	MARLER DR	100	10.7	LOC	Y	RECON	2031	$58,850
Ana-0480-150	42 AVE	1448	1679	41 ST	39 ST	231	12.49437	COL	N			
Ana-0480-160	42 AVE	1679	1924	39 ST	37 ST / 38 ST	245	11.2	COL	N			
Ana-0490-010	42 AVE CL	0	112	Southwest End	73 ST	112	13.5	LOC	Y			
Ana-0500-010	42 ST	0	149	49 AVE	50 AVE	149	10.7	LOC	Y			
Ana-0500-020	42 ST	149	220	50 AVE	NO NAME	71	17.5	LOC	Y	MF50	2033	$40,082
Ana-0500-030	42 ST	221	315	52 AVE	52A AVE	94	10.5	LOC	Y			
Ana-0500-040	42 ST	315	457	52A AVE	52B AVE	142	10.8	LOC	Y			
Ana-0510-010	42A AVE	0	83	69 ST	East End	83	15.2	LOC	Y			
Ana-0520-010	43 AVE	0	85	75 ST	74 ST	85	10.9	COL	Y	FDM	2039	$60,222
Ana-0520-020	43 AVE	85	183	74 ST	73 ST	98	10.89592	COL	Y	MF50	2038	$35,011
Ana-0520-030	43 AVE	183	276	73 ST	72 ST	93	10.5	COL	Y	MF50	2036	$31,606
Ana-0520-040	43 AVE	276	381	72 ST	71 ST	105	10.9619	COL	Y	MF50	2035	$36,796
Ana-0520-050	43 AVE	381	500	71 ST	69 ST / 70 ST	119	11.3	COL	Y	MF50	2023	$40,341
Ana-0520-060	43 AVE	501	595	67 ST	66 ST	94	10	LOC	Y			
Ana-0520-070	43 AVE	596	688	66 ST	65 ST	92	10.7	LOC	Y			
Ana-0520-080	43 AVE	688	789	65 ST	64 ST CL	101	11	COL	Y	MF50	2020	$36,244
Ana-0520-090	43 AVE	789	883	64 ST CL	63 ST	94	10.9	COL	Y	MF50	2035	$32,756
Ana-0520-100	43 AVE	883	960	63 ST	63 ST	77	10.5	COL	Y			
Ana-0520-110	43 AVE	960	1088	63 ST	62 ST	128	10.9	COL	Y	MF50	2038	$45,746
Ana-0520-120	43 AVE	1088	1196	62 ST	MOUNT PLEASANT DR	108	10.7	COL	Y	FDM	2038	$75,114
Ana-0520-130	43 AVE	1196	1448	MOUNT PLEASANT DR	59 ST	252	10.5	COL	Y	MF50	2036	$105,911
Ana-0520-140	43 AVE	1448	1925	59 ST	MARLER DR	477	10.7	COL	Y			
Ana-0520-150	43 AVE	1926	2018	55 ST	East End	92	13.1	LOC	Y			
Ana-0520-160	43 AVE	2019	2278	53 ST	52 ST	259	9.9	LOC	Y	RECON	2031	$141,025
Ana-0520-170	43 AVE	2279	2440	38 ST		161	9.4	LOC	N	RCLM	2037	$83,237
Ana-0530-010	43 ST	0	379	South End	44 AVE	379	14.5	COL	N			
Ana-0530-030	43 ST	535	694	49 AVE	50 AVE	159	10.8	LOC	Y	RECON	2028	$94,446
Ana-0530-040	43 ST	694	799	50 AVE	North End	105	15.9	LOC	Y			
Ana-0530-050	43 ST	800	880	52 AVE	52A AVE	80	10.6	LOC	Y			
Ana-0530-060	43 ST	880	1021	52A AVE	52B AVE	141	11	LOC	Y			
Ana-0540-010	43A AVE CL	0	101	West End	63 ST	101	11.6	LOC	Y	MF50	2028	$40,846
Ana-0550-010	44 AVE	0	42	West End	75 ST	42	9.1	LOC	Y			
Ana-0550-020	44 AVE	42	132	75 ST	74 ST	90	9	LOC	Y			
Ana-0550-030	44 AVE	132	229	74 ST	44 AVE CL / 73 ST	97	9.4	LOC	Y			
Ana-0550-040	44 AVE	230	317	67 ST	66A ST	87	10.3	LOC	Y			
Ana-0550-050	44 AVE	317	427	66A ST	66 ST	110	8.8	LOC	Y			
Ana-0550-060	44 AVE	428	676	MOUNT PLEASANT DR	59 ST	248	9.3	LOC	Y	RECON	2029	$126,852
Ana-0550-070	44 AVE	779	836		ARENA PARKING LOT ACCESS RD	57	12.2	LOC	Y			
Ana-0550-080	44 AVE	836	987	ARENA PARKING LOT ACCESS RD	55 ST	151	11.3	LOC	Y	RECON	2030	$93,847
Ana-0550-090	44 AVE	987	1193	55 ST	53 ST	206	10.9	COL	Y	MF50	2024	$82,012
Ana-0550-100	44 AVE	1193	1306	53 ST	52A ST	113	10.3	COL	Y	MF50	2035	$44,840
Ana-0550-110	44 AVE	1306	1403	52A ST	52 ST	97	10.2	COL	Y			
Ana-0550-120	44 AVE	1403	1556	52 ST	50 ST	153	11.45667	COL	Y			
Ana-0550-130	44 AVE	1557	1961	43 ST	41 ST	404	12.4	COL	N	OL50	2038	$208,197
Ana-0550-140	44 AVE	1961	2195	41 ST	39 ST	234	12.5	COL	N			
Ana-0550-150	44 AVE	2195	2441	39 ST	38 ST	246	12.9	COL	N	OL50	2024	$94,657
Ana-0550-160	44 AVE	2441	2550	38 ST	37 ST	109	12.7	COL	N			
Ana-0550-170	44 AVE	2550	2650	37 ST	37 ST	100	12.7	COL	N			
Ana-0560-010	44 AVE CL	0	91	44 AVE / 73 ST	East End	91	16.2	LOC	Y			
Ana-0570-010	44 ST	0	198	47 AVE	48 AVE	198	11.1	COL	N	OL50	2036	$93,528
Ana-0570-020	44 ST	199	358	49 AVE	50 AVE	159	10.8	LOC	Y	MF50	2025	$57,958
Ana-0570-030	44 ST	358	500	50 AVE	NO NAME	142	13.8	LOC	Y			
Ana-0570-040	44 ST	501	562	52 AVE	52A AVE	61	10.5	LOC	Y			
Ana-0570-050	44 ST	562	704	52A AVE	52B AVE	142	10.9	LOC	Y			
Ana-0580-010	44A AVE	0	140	Southwest End	63 ST	140	13.2	LOC	Y	MF50	2034	$57,879
Ana-0580-020	44A AVE	141	220	53 ST	52A ST	79	9.6	LOC	Y			
Ana-0590-010	44A AVE CL	0	88	73 ST	East End	88	16.1	LOC	Y			
Ana-0600-010	44B AVE	0	90	75 ST	74 ST	90	9	LOC	Y			
Ana-0600-020	44B AVE	90	227	74 ST	73 ST	137	9.1	LOC	Y			
Ana-0600-030	44B AVE	228	348	67 ST	66 ST	120	9.8	LOC	Y			
Ana-0600-040	44B AVE	348	438	66 ST	66 ST	90	16.32667	LOC	Y			
Ana-0600-050	44B AVE	440	634	65 ST	63 ST	194	9.3	LOC	Y			
Ana-0600-060	44B AVE	634	841	63 ST	62 ST	207	9.5	LOC	Y			
Ana-0610-010	45 AVE	0	44	West End	75 ST	44	11.8	COL	Y			
Ana-0610-020	45 AVE	44	128	75 ST	74 ST	84	11.7	COL	Y			
Ana-0610-030	45 AVE	128	211	74 ST	73A ST	83	11.8	COL	Y			
Ana-0610-040	45 AVE	211	324	73A ST	73 ST	113	12.3	COL	Y			
Ana-0610-050	45 AVE	324	368	73 ST	NO NAME	44	12.3	COL	Y	MF50	2022	$17,483
Ana-0610-060	45 AVE	368	431	NO NAME	BLANK_1	63	11.7	COL	Y			
Ana-0610-070	45 AVE	431	530	BLANK_1	NO NAME	99	12.1	COL	Y			
Ana-0610-080	45 AVE	530	631	NO NAME	NO NAME	101	12.3	COL	Y			
Ana-0610-090	45 AVE	631	729	NO NAME	69 ST	98	12	COL	Y			
Ana-0610-100	45 AVE	729	807	69 ST	68 ST SB	78	12	COL	Y			
Ana-0610-110	45 AVE	807	924	68 ST SB	67 ST	117	12	COL	Y	MF50	2035	$55,041
Ana-0610-120	45 AVE	924	1020	67 ST	66 ST CL	96	10.4	COL	Y	MF50	2037	$42,308
Ana-0610-130	45 AVE	1020	1069	66 ST CL	66 ST	49	11.3	COL	Y	MF50	2024	$21,855
Ana-0610-140	45 AVE	1069	1198	66 ST	65 ST	129	10.7	COL	Y	MF50	2024	$47,958
Ana-0610-150	45 AVE	1198	1608	65 ST	62 ST	410	11	COL	Y			
Ana-0610-160	45 AVE	1608	1648	62 ST	COMP RD	40	10.7	COL	Y	MF50	2036	$13,683
Ana-0610-170	45 AVE	1648	1711	COMP RD	61 ST	63	10.1	COL	Y	MF50	2033	$19,876
Ana-0610-180	45 AVE	1711	1799	61 ST	MOUNT PLEASANT DR	88	10.7	COL	Y	MF50	2024	$30,962
Ana-0610-190	45 AVE	1800	1947	ARENA PARKING LOT ACCESS RD	55 ST	147	14.7	LOC	Y			
Ana-0610-200	45 AVE	1947	2045	55 ST	54 ST	98	13.4	LOC	Y			
Ana-0610-210	45 AVE	2045	2151	54 ST	53 ST	106	13.6	LOC	Y			
Ana-0610-220	45 AVE	2152	2261	53 ST	52A ST	109	8.2	LOC	Y	MF50	2037	$28,744
Ana-0620-010	45 ST	0	197	46 AVE	47 AVE	197	11	LOC	Y			
Ana-0620-020	45 ST	197	395	47 AVE	48 AVE	198	10.9	LOC	Y			
Ana-0620-030	45 ST	396	555	49 AVE	50 AVE	159	10.6	LOC	Y			
Ana-0620-040	45 ST	556	715	50 AVE	NO NAME	159	13.3	LOC	Y			
Ana-0620-060	45 ST	762	900	52 AVE / 52A AVE	52B AVE	138	10.7	LOC	Y			
Ana-0630-010	45A AVE	0	88	West End	65 ST	88	14.2	LOC	Y	MF50	2032	$38,931
Ana-0630-020	45A AVE	89	187	53 ST	52A ST	98	8.9	LOC	Y			
Ana-0640-010	46 AVE	0	84	75 ST	74 ST	84	9.80119	LOC	Y			
Ana-0640-020	46 AVE	84	166	74 ST	73A ST	82	9.9	LOC	Y			
Ana-0640-030	46 AVE	167	333	73 ST	71 ST CL	166	10.3	LOC	Y			
Ana-0640-040	46 AVE	333	550	71 ST CL	69 ST	217	10.4	LOC	Y			
Ana-0640-050	46 AVE	551	725	West End	65 ST	174	11.5	LOC	Y			

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-0640-060	46 AVE	726	841	57 ST	56 ST	115	10.6	LOC	Y			
Ana-0640-070	46 AVE	841	1055	56 ST	54 ST	214	10.8	LOC	Y			
Ana-0640-080	46 AVE	1055	1160	54 ST	53 ST	105	10.9	LOC	Y			
Ana-0640-090	46 AVE	1161	1204	52 ST	East End	43	11.4	LOC	Y			
Ana-0640-100	46 AVE	1205	1320	50 ST	49 ST / AUGUSTANA S	115	11	LOC	N	RCLM	2033	$69,575
Ana-0640-110	46 AVE	1320	1420	49 ST / AUGUSTANA S	48 ST	100	11	LOC	N	RCLM	2030	$60,500
Ana-0640-120	46 AVE	1420	1463	48 ST	48 ST	43	10.1	LOC	Y	RECON	2027	$23,887
Ana-0640-130	46 AVE	1463	1574	48 ST	47 ST	111	10.5	LOC	Y	RECON	2034	$64,103
Ana-0640-140	46 AVE	1574	1692	47 ST	46 ST	118	10.2	LOC	N	RCLM	2034	$66,198
Ana-0640-150	46 AVE	1692	1809	46 ST	45 ST	117	11.1	LOC	Y			
Ana-0650-010	46 ST	0	165	South End	46 AVE	165	13.5	LOC	Y	MF50	2020	$70,563
Ana-0650-020	46 ST	165	368	46 AVE	47 AVE	203	10.9	LOC	Y	MF50	2020	$66,746
Ana-0650-030	46 ST	368	567	47 AVE	48 AVE	199	10.9	COL	Y	MF50	2020	$65,908
Ana-0650-040	46 ST	568	735	48 AVE WB	49 AVE	167	13.1	COL	Y			
Ana-0650-050	46 ST	735	790	49 AVE	49 AVE	55	12.9	COL	Y			
Ana-0650-060	46 ST	790	895	49 AVE	50 AVE	105	12.99905	COL	Y			
Ana-0650-070	46 ST	895	961	50 AVE	50 AVE	66	11.8	COL	Y	MF50	2022	$25,851
Ana-0650-080	46 ST	961	1125	50 AVE	51 AVE	164	12.56037	COL	N	OL50	2021	$62,647
Ana-0650-090	46 ST	1131	1235	52 AVE	52B AVE	104	11.7	LOC	Y			
Ana-0650-100	46 ST	1235	1426	52B AVE	53 AVE	191	10.9	LOC	Y			
Ana-0650-110	46 ST	1426	1629	53 AVE	54 AVE	203	10.8	LOC	Y			
Ana-0660-010	47 AVE	0	106	61 ST	MONTJOY AVE	106	9.2	LOC	Y			
Ana-0660-020	47 AVE	106	279	MONTJOY AVE	MOUNT PLEASANT DR	173	9	LOC	Y			
Ana-0660-030	47 AVE	280	389	MOUNT PLEASANT DR	MONTCLARE AVE	109	10.8	COL	Y			
Ana-0660-040	47 AVE	389	515	MONTCLARE AVE	57 ST	126	11.2	COL	Y	MF50	2039	$60,956
Ana-0660-050	47 AVE	515	633	57 ST	56 ST	118	11	COL	Y			
Ana-0660-060	47 AVE	633	751	56 ST	55 ST	118	10.8	COL	Y	MF50	2037	$41,785
Ana-0660-070	47 AVE	751	850	55 ST	54 ST	99	10.6	COL	Y	MF50	2035	$39,774
Ana-0660-080	47 AVE	850	950	54 ST	53 ST	100	10.6	COL	Y	MF50	2037	$42,637
Ana-0660-090	47 AVE	950	1038	53 ST	52 ST	88	11.6	COL	Y	FDM	2038	$66,352
Ana-0660-100	47 AVE	1038	1094	52 ST	51A ST	56	11.9	COL	Y			
Ana-0660-110	47 AVE	1094	1138	51A ST	TRAIL 169	44	11.2	COL	Y			
Ana-0660-120	47 AVE	1138	1197	TRAIL 169	51 ST	59	11.2	COL	Y			
Ana-0660-130	47 AVE	1197	1293	51 ST	50 ST_SB	96	10.8	COL	Y			
Ana-0660-140	47 AVE	1293	1417	50 ST_SB	49 ST	124	11	COL	Y	MF50	2039	$57,687
Ana-0660-150	47 AVE	1417	1517	49 ST	48 ST	100	10.4	COL	Y			
Ana-0660-160	47 AVE	1517	1670	48 ST	47 ST	153	10.4	COL	Y			
Ana-0660-170	47 AVE	1670	1788	47 ST	46 ST	118	10.6	COL	Y	FDM	2038	$81,302
Ana-0660-180	47 AVE	1788	1904	46 ST	45 ST	116	10.7	COL	Y	MF50	2036	$50,025
Ana-0660-190	47 AVE	1904	2015	45 ST	44 ST	111	11.3	COL	N	OL50	2035	$47,521
Ana-0660-200	47 AVE	2017	2250	41 ST	39 ST	233	11.8	COL	N			
Ana-0660-210	47 AVE	2250	2614	39 ST	38 ST	364	10.5	COL	N	OL50	2038	$151,109
Ana-0660-220	47 AVE	2614	2777	38 ST	Southeast End	163	11	COL	N			
Ana-0660-230	47 AVE	2778	2979	37 ST	36 ST	201	10.2	COL	N			
Ana-0670-010	47 ST	0	150	South End	46 AVE	150	13.8	LOC	Y			
Ana-0670-020	47 ST	150	353	46 AVE	47 AVE	203	10.91429	LOC	Y			
Ana-0670-030	47 ST	353	552	47 AVE	48 AVE	199	10.8005	LOC	Y			
Ana-0670-040	47 ST	553	799	48 AVE WB	49 AVE	246	10.8	LOC	Y	RECON	2030	$146,124
Ana-0670-050	47 ST	799	972	49 AVE	50 AVE	173	10.50173	LOC	Y			
Ana-0670-060	47 ST	1145	1426	48 ST / 52 AVE	53 AVE	281	15.5	COL	Y	MF50	2036	$174,659
Ana-0670-070	47 ST	1426	1491	53 AVE	NO NAME	65	15.1	COL	Y	MF50	2038	$39,128
Ana-0670-080	47 ST	1491	1628	NO NAME	54 AVE	137	15.1	COL	Y			
Ana-0670-090	47 ST	1628	1868	54 AVE	55 AVE	240	14.40292	COL	Y	RECON	2027	$466,655
Ana-0670-100	47 ST	1868	1891	55 AVE		23	13.5	COL	Y	MF50	2020	$10,306
Ana-0680-010	47A AVE	0	274	61 ST	MOUNT PLEASANT DR	274	9.1	LOC	Y			
Ana-0680-020	47A AVE	275	641	MOUNT PLEASANT DR	56 ST	366	10.8	LOC	Y	MF50	2028	$130,843
Ana-0690-010	48 AVE	0	914	West End	RGE RD 204 / RGE RD 205	914	14.4	ART	N	OL50	2030	$370,432
Ana-0690-020	48 AVE	914	1955	RGE RD 204 / RGE RD 205	73 ST	1041	13.97442	ART	N	OL50	2029	$449,080
Ana-0690-030	48 AVE	1955	2420	73 ST	68 ST SB	465	13.8	ART	Y	MF50	2021	$230,357
Ana-0690-040	48 AVE	2420	2801	68 ST SB	65 ST	381	12.8685	ART	Y	MF50	2020	$151,121
Ana-0690-050	48 AVE	2801	3244	65 ST	COMP RD	443	8.306997	ART	Y	MF50	2019	$0
Ana-0690-060	48 AVE	3244	3287	COMP RD	S 48TH AVE SERVICE RD	43	7.5	ART	Y	MF50	2019	$0
Ana-0690-070	48 AVE	3287	3359	S 48TH AVE SERVICE RD	GRAND PARK CRES	72	7.5	ART	Y	MF50	2019	$0
Ana-0690-080	48 AVE	3359	3557	GRAND PARK CRES	S 48TH AVE SERVICE RD	198	7.2	ART	Y	MF50	2019	$0
Ana-0690-090	48 AVE	3557	3587	S 48TH AVE SERVICE RD	MOUNT PLEASANT DR	30	7.2	ART	Y	MF50	2019	$0
Ana-0690-100	48 AVE	3587	3673	MOUNT PLEASANT DR	58 ST	86	11.3	ART	Y	MF50	2024	$35,728
Ana-0690-110	48 AVE	3673	3915	58 ST	S 48TH AVE SERVICE RD	242	15.1	ART	Y	MF50	2020	$133,642
Ana-0690-120	48 AVE	3915	4058	S 48TH AVE SERVICE RD	55 ST	143	11.05664	ART	Y	MF50	2022	$60,366
Ana-0690-130	48 AVE	4058	4157	55 ST	54 ST	99	10.6	ART	Y	MF50	2027	$37,371
Ana-0690-140	48 AVE	4157	4257	54 ST	53 ST	100	10.6	ART	Y	MF50	2024	$36,159
Ana-0690-150	48 AVE	4257	4599	53 ST	50 ST_SB	342	10.4538	ART	Y	MF50	2033	$141,598
Ana-0690-160	48 AVE	4599	4723	50 ST_SB	49 ST	124	10.2	ART	Y	MF50	2030	$47,112
Ana-0690-170	48 AVE	4723	4822	49 ST	48 ST	99	11.2	ART	Y	MF50	2025	$39,463
Ana-0690-180	48 AVE	4822	5325	48 ST	44 ST	503	9.419682	ART	Y	MF50	2021	$173,401
Ana-0690-220	48 AVE	5325	5680	44 ST	41 ST	355	8.8	ART	Y	FDM	2022	$234,300
Ana-0690-230	48 AVE	5680	5909	41 ST		229	14	ART	Y	MF50	2022	$118,537
Ana-0690-235	48 AVE	5909	6363		S 48TH AVE SERVICE RD	454	9.316299	ART	Y	MF50	2030	$159,598
Ana-0690-240	48 AVE	6363	6874	S 48TH AVE SERVICE RD	36 ST	511	11.5047	ART	Y	FDM	2023	$440,918
Ana-0690-250	48 AVE	6874	6973	36 ST	NO NAME	99	11.8	ART	Y	FDM	2022	$87,615
Ana-0690-260	48 AVE	6973	7069	NO NAME	EAST END 1	96	11.8	ART	Y	FDM	2022	$84,960
Ana-0690-270	48 AVE	7069	7260	EAST END 1	EAST END 2	191	12.1	ART	Y	FDM	2022	$173,333
Ana-0690-280	48 AVE	7260	7451	EAST END 2	EAST END 3	191	12.1	ART	Y	FDM	2022	$173,333
Ana-0690-290	48 AVE	7451	7710	EAST END 3	EXHIBITION DR / HIGHWAY 13	259	14	ART	Y	FDM	2023	$271,950
Ana-0700-010	48 AVE WB	1	464	73 ST	68 ST SB	463	14.3	ART	Y	MF50	2021	$222,131
Ana-0700-020	48 AVE WB	464	696	68 ST SB	66 ST	232	15.65776	ART	Y	MF50	2020	$118,265
Ana-0700-030	48 AVE WB	696	1170	66 ST	GRAND DR	474	8.821519	ART	Y	MF50	2020	$147,960
Ana-0700-040	48 AVE WB	1170	1289	GRAND DR	COMP RD	119	7.2	ART	Y	MF50	2019	$0
Ana-0700-050	48 AVE WB	1289	1404	COMP RD	GRAND PARK CRES	115	6.7	ART	Y	MF50	2019	$0
Ana-0700-060	48 AVE WB	1404	1632	GRAND PARK CRES	MOUNT PLEASANT DR	228	8.697369	ART	Y	MF50	2019	$0
Ana-0700-070	48 AVE WB	1632	1718	MOUNT PLEASANT DR	58 ST	86	10.4	ART	Y	MF50	2020	$30,700
Ana-0700-080	48 AVE WB	1718	1985	58 ST	56 ST	267	12.3	ART	Y	MF50	2021	$119,835
Ana-0700-090	48 AVE WB	1985	2302	56 ST	53 ST	317	12.95426	ART	Y	MF50	2027	$146,815
Ana-0700-100	48 AVE WB	2302	2546	53 ST	51 ST	244	11.5	ART	Y	MF50	2032	$109,439
Ana-0700-110	48 AVE WB	2546	2644	51 ST	50 ST_SB	98	8.6	ART	Y	MF50	2035	$28,755
Ana-0700-120	48 AVE WB	2644	2858	50 ST_SB	48 ST	214	10.0798	ART	Y	MF50	2021	$72,653
Ana-0700-140	48 AVE WB	2858	2971	48 ST	47 ST	113	10.7	ART	Y	MF50	2021	$39,041
Ana-0700-150	48 AVE WB	2971	3138	47 ST	46 ST	167	8.3	ART	Y	MF50	2020	$50,299
Ana-0700-160	48 AVE WB	3138	3725	46 ST	41 ST	587	9.355707	ART	Y	MF50	2021	$190,335
Ana-0700-170	48 AVE WB	3725	3957	41 ST	39 ST_SB	232	12.9	ART	Y	MF50	2022	$98,139
Ana-0700-180	48 AVE WB	3957	4419	39 ST_SB	HIGHWAY 26	462	8.977922	ART	N	OL50	2029	$126,285
Ana-0700-190	48 AVE WB	4419	5759	HIGHWAY 26	RGE RD 201	1340	13.42216	ART	N	OL50	2021	$529,793
Ana-0700-200	48 AVE WB	5759	6258	RGE RD 201	HIGHWAY 13	499	9	ART	N	OL50	2021	$158,654
Ana-0710-010	48 ST	0	187	South End	46 AVE	187	12.6	LOC	Y	RECON	2028	$129,591
Ana-0710-020	48 ST	188	391	46 AVE	47 AVE	203	10.7	LOC	Y	RECON	2028	$119,465
Ana-0710-030	48 ST	391	590	47 AVE	48 AVE	199	10.7	COL	Y	FDM	2031	$138,404
Ana-0710-040	48 ST	591	682	48 AVE WB	48A AVE	91	15.2	COL	Y			
Ana-0710-050	48 ST	682	854	48A AVE	49 AVE	172	14.4	COL	Y			
Ana-0710-060	48 ST	854	1027	49 AVE	50 AVE	173	14.2	COL	Y			
Ana-0710-070	48 ST	1027	1199	50 AVE	51 AVE	172	14.3	COL	Y			
Ana-0710-080	48 ST	1199	1348	51 AVE	47 ST / 52 AVE	149	15.7	COL	Y			
Ana-0710-090	48 ST	1349	1607	52 AVE	53 AVE	258	11	LOC	Y			
Ana-0710-100	48 ST	1608	1647	54 AVE	NO NAME	39	10.9	LOC	N			
Ana-0720-010	48A AVE	0	43	West End	64 ST	43	9	LOC	Y	MF50	2034	$13,518
Ana-0720-020	48A AVE	43	268	64 ST	GRAND DR / GRANDVIEW CRES	225	9	LOC	Y	RECON	2034	$111,375
Ana-0720-030	48A AVE	269	465	60 ST	58 ST	196	8.8	LOC	Y	MF50	2028	$58,139
Ana-0720-040	48A AVE	466	556	West End	54 ST	90	13.7	LOC	Y			
Ana-0720-050	48A AVE	556	667	54 ST	53A ST	111	10.5	LOC	Y			

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-0720-060	48A AVE	667	728	53A ST	53 ST	61	11.4	LOC	Y			
Ana-0720-070	48A AVE	729	769	53 ST	52A ST	40	13	ART	Y	MF50	2021	$21,722
Ana-0720-080	48A AVE	769	869	52A ST	52 ST	100	13.1	ART	Y	MF50	2020	$47,329
Ana-0720-090	48A AVE	869	968	52 ST	51 ST	99	13	ART	Y	MF50	2020	$45,017
Ana-0720-100	48A AVE	968	1072	51 ST	50 ST	104	12.9	COL	Y	MF50	2024	$50,583
Ana-0720-110	48A AVE	1072	1177	50 ST	49 ST	105	12.2	LOC	Y			
Ana-0720-120	48A AVE	1177	1276	49 ST	48 ST	99	10	LOC	Y			
Ana-0730-010	48B AVE	0	225	64 ST	GRAND DR / GRANDVIEW CRES	225	9.1	LOC	Y			
Ana-0730-020	48B AVE	226	373	GRAND PARK CRES	60 ST	147	9	LOC	Y			
Ana-0730-030	48B AVE	373	574	60 ST	58 ST	201	9.3	LOC	Y	RECON	2031	$102,812
Ana-0730-040	48B AVE	574	744	58 ST	East End	170	12.1	LOC	Y			
Ana-0740-010	49 AVE	0	248	66 ST	64 ST	248	10.9	LOC	Y			
Ana-0740-020	49 AVE	249	479	64 ST	GRAND DR	230	9.206522	LOC	Y	FDM	2035	$116,463
Ana-0740-030	49 AVE	480	576	58 ST	57 ST	96	10.7	LOC	Y			
Ana-0740-040	49 AVE	576	749	57 ST	56 ST	173	10.8	LOC	Y	MF50	2034	$59,347
Ana-0740-050	49 AVE	749	921	56 ST	54 ST	172	10.8	LOC	Y	FDM	2036	$102,168
Ana-0740-060	49 AVE	921	1094	54 ST	53 ST	173	10.9	LOC	Y	MF50	2031	$58,797
Ana-0740-070	49 AVE	1094	1161	53 ST	52A ST	67	9.6	LOC	Y			
Ana-0740-080	49 AVE	1161	1260	52A ST	52 ST	99	9.7	LOC	Y			
Ana-0740-090	49 AVE	1260	1360	52 ST	51 ST	100	10.9	LOC	Y			
Ana-0740-100	49 AVE	1360	1464	51 ST	50 ST	104	11.2	COL	Y			
Ana-0740-110	49 AVE	1464	1569	50 ST	49 ST	105	12.8	COL	Y			
Ana-0740-120	49 AVE	1569	1668	49 ST	48 ST	99	12.8	COL	Y			
Ana-0740-130	49 AVE	1668	1780	48 ST	47 ST	112	12.7	LOC	Y			
Ana-0740-140	49 AVE	1780	1910	47 ST	46 ST	130	12.3	LOC	Y			
Ana-0740-150	49 AVE	1911	2019	46 ST	45 ST	108	10.9	LOC	Y	MF50	2037	$37,161
Ana-0740-160	49 AVE	2019	2143	45 ST	44 ST	124	10.6	LOC	Y	MF50	2037	$41,492
Ana-0740-170	49 AVE	2143	2183	44 ST	43 ST	40	10	LOC	Y	MF50	2035	$12,561
Ana-0740-180	49 AVE	2183	2242	43 ST	43 ST	59	10.8	LOC	Y	RECON	2026	$35,046
Ana-0740-190	49 AVE	2242	2346	43 ST	42 ST	104	11	LOC	Y	RECON	2027	$62,920
Ana-0750-010	49 ST	290	492	46 AVE	47 AVE	202	10.4	LOC	Y	RECON	2028	$115,544
Ana-0750-020	49 ST	492	691	47 AVE	48 AVE	199	9.9	LOC	Y			
Ana-0750-030	49 ST	692	798	48 AVE WB	48A AVE	106	11.8	LOC	Y			
Ana-0750-040	49 ST	798	971	48A AVE	49 AVE	173	11.90809	LOC	Y			
Ana-0750-050	49 ST	971	1143	49 AVE	50 AVE	172	13.3	LOC	Y			
Ana-0750-060	49 ST	1143	1315	50 AVE	51 AVE	172	13.7	LOC	Y			
Ana-0750-070	49 ST	1316	1556	52 AVE	53 AVE	240	10.7	LOC	Y			
Ana-0750-080	49 ST	1557	1613	South End	55 AVE	56	10.9	LOC	Y			
Ana-0760-010	49A AVE	0	135	71 ST	69 ST	135	9.6	LOC	Y			
Ana-0770-010	50 AVE	0	124	71 ST	70 ST	124	12.9	COL	Y			
Ana-0770-020	50 AVE	124	191	70 ST	69 ST	67	12.9	COL	Y			
Ana-0770-030	50 AVE	191	336	69 ST	NO NAME	145	13.2	COL	Y			
Ana-0770-040	50 AVE	336	423	NO NAME	68 ST SB	87	11.6	COL	Y			
Ana-0770-050	50 AVE	423	560	68 ST SB	66 ST	137	12.2	COL	Y	MF50	2035	$62,219
Ana-0770-060	50 AVE	560	615	66 ST	65A ST	55	8.9	LOC	Y			
Ana-0770-070	50 AVE	615	715	65A ST	65 ST	100	8.7	LOC	Y	MF50	2027	$31,748
Ana-0770-080	50 AVE	715	805	65 ST	64 ST	90	9.8	LOC	Y			
Ana-0770-090	50 AVE	806	905	58 ST / GRAND DR	57 ST	99	13.4	COL	Y			
Ana-0770-100	50 AVE	905	1077	57 ST	56 ST	172	13.7	COL	Y			
Ana-0770-110	50 AVE	1077	1250	56 ST	54 ST	173	13.7	COL	Y			
Ana-0770-120	50 AVE	1250	1422	54 ST	53 ST	172	13.59709	COL	Y			
Ana-0770-130	50 AVE	1422	1514	53 ST	52A ST	92	13.1	COL	Y			
Ana-0770-140	50 AVE	1514	1614	52A ST	52 ST	100	13.299	COL	Y			
Ana-0770-150	50 AVE	1614	1713	52 ST	51 ST	99	13.2	COL	Y			
Ana-0770-160	50 AVE	1713	1817	51 ST	50 ST	104	13.4	COL	Y	FDM	2037	$90,584
Ana-0770-170	50 AVE	1817	1922	50 ST	49 ST	105	14.2	COL	Y	MF50	2024	$58,892
Ana-0770-180	50 AVE	1922	2021	49 ST	48 ST	99	14	COL	Y	FDM	2038	$90,090
Ana-0770-190	50 AVE	2021	2133	48 ST	47 ST	112	13.4	COL	Y			
Ana-0770-200	50 AVE	2133	2253	47 ST	46 ST	120	13.9	COL	Y			
Ana-0770-210	50 AVE	2254	2362	46 ST	45 ST	108	10.9	LOC	Y	MF50	2032	$39,657
Ana-0770-220	50 AVE	2362	2486	45 ST	44 ST	124	10.5	LOC	Y	MF50	2029	$41,213
Ana-0770-230	50 AVE	2486	2585	44 ST	43 ST	99	10.5	LOC	Y	MF50	2029	$32,999
Ana-0770-240	50 AVE	2585	2684	43 ST	42 ST	99	10.6	LOC	Y			
Ana-0770-250	50 AVE	2684	2800	42 ST	East End	116	14	LOC	Y			
Ana-0780-010	50 ST	2738	2894	CAMROSE DR / NO NAME	34 AVE_EB	156	17	COL	Y			
Ana-0780-020	50 ST	2894	3272	34 AVE_EB	WT BUILDING RD ACCESS	378	11.67143	COL	Y			
Ana-0780-030	50 ST	3272	3533	WT BUILDING RD ACCESS	49 ST	261	10.80307	COL	Y			
Ana-0780-040	50 ST	3533	3925	49 ST	AUGUSTANA DORMES	392	10.8	COL	Y			
Ana-0780-050	50 ST	3925	4110	AUGUSTANA DORMES	44 AVE	185	12.4	COL	Y			
Ana-0780-060	50 ST	4110	4524	44 AVE	46 AVE	414	15.16618	COL	N			
Ana-0780-070	50 ST	4525	4728	46 AVE	47 AVE	203	7.7	COL	Y			
Ana-0780-080	50 ST	4728	4927	47 AVE	48 AVE	199	8.4	COL	Y			
Ana-0780-090	50 ST	4928	5049	48 AVE WB	48A AVE	121	10	COL	Y			
Ana-0780-100	50 ST	5050	5222	48A AVE	49 AVE	172	18	COL	Y			
Ana-0780-110	50 ST	5222	5394	49 AVE	50 AVE	172	17.9	COL	Y			
Ana-0780-120	50 ST	5394	5566	50 AVE	51 AVE	172	18	COL	Y			
Ana-0780-130	50 ST	5568	5780	52 AVE	53 AVE	212	11.7	LOC	Y			
Ana-0780-140	50 ST	5780	5984	53 AVE	54 AVE	204	10.99902	LOC	Y			
Ana-0780-150	50 ST	5984	6141	54 AVE	54A AVE	157	10.8	LOC	N			
Ana-0780-160	50 ST	6141	6257	54A AVE	55 AVE	116	10.8	LOC	N			
Ana-0790-010	50 ST_SB	0	203	South End	47 AVE	203	8.3	COL	Y			
Ana-0790-020	50 ST_SB	203	402	47 AVE	48 AVE	199	7.6	COL	Y	FDM	2037	$98,306
Ana-0790-030	50 ST_SB	403	527	48 AVE WB	48A AVE	124	10.4	COL	Y			
Ana-0800-010	500 PARKRIDGE CL	0	53	Southwest End	PARKRIDGE DR	53	15.6	LOC	Y			
Ana-0810-010	50A AVE	0	94	65A ST	65 ST	94	11.7	LOC	Y			
Ana-0810-020	50A AVE	95	158	57 ST	East End	63	15.6	LOC	Y			
Ana-0820-010	50A ST CL	0	67	34 AVE / NO NAME	North End	67	14.6	LOC	Y			
Ana-0830-010	50B ST CL	0	84	34 AVE / NO NAME	North End	84	14	LOC	Y			
Ana-0840-020	51 AVE	124	223	58 ST	57 ST	99	10.5	LOC	Y	MF50	2038	$33,680
Ana-0840-030	51 AVE	223	396	57 ST	56 ST	173	10.8	LOC	Y			
Ana-0840-040	51 AVE	396	568	56 ST	54 ST	172	10.8	LOC	Y			
Ana-0840-050	51 AVE	568	741	54 ST	53 ST	173	10.82197	LOC	Y			
Ana-0840-060	51 AVE	741	860	53 ST	52A ST	119	14.6	COL	Y			
Ana-0840-070	51 AVE	860	960	52A ST	52 ST	100	14.9	COL	Y	FDM	2038	$96,850
Ana-0840-080	51 AVE	960	1059	52 ST	51 ST	99	14.9	COL	Y	MF50	2019	$0
Ana-0840-090	51 AVE	1059	1164	51 ST	50 ST	105	15.1	COL	Y	MF50	2019	$0
Ana-0840-100	51 AVE	1164	1268	50 ST	49 ST	104	14.9	COL	Y	MF50	2019	$0
Ana-0840-110	51 AVE	1268	1367	49 ST	48 ST	99	14.5	COL	Y	MF50	2019	$0
Ana-0840-120	51 AVE	1367	1479	48 ST	47 ST	112	14.8	COL	Y			
Ana-0840-130	51 AVE	1479	1623	47 ST	46 ST	144	14.1	COL	Y			
Ana-0840-140	51 AVE	1623	2299	46 ST	41 ST	676	13.9	COL	N	RCLM	2039	$610,766
Ana-0840-150	51 AVE	2299	2449	41 ST	39 ST_SB	150	15.3	COL	N			
Ana-0850-010	51 ST	0	212	34 AVE / 51 ST CL	36 AVE	212	10.1	LOC	Y			
Ana-0850-020	51 ST	213	391	47 AVE	North End	178	10.2	LOC	Y	FDM	2035	$99,858
Ana-0850-030	51 ST	392	531	48 AVE WB	48A AVE	139	14.4	ART	Y	FDM	2025	$150,120
Ana-0850-040	51 ST	531	703	48A AVE	49 AVE	172	13.7	COL	Y	MF50	2026	$87,494
Ana-0850-050	51 ST	703	876	49 AVE	50 AVE	173	13.6	COL	Y	MF50	2025	$86,019
Ana-0850-060	51 ST	876	1047	50 AVE	51 AVE	171	14.2	COL	Y	FDM	2038	$157,833
Ana-0850-070	51 ST	1048	1240	52 AVE	53 AVE	192	10.7974	LOC	Y	MF50	2030	$64,466
Ana-0850-080	51 ST	1240	1442	53 AVE	54 AVE	202	10.3	LOC	Y	MF50	2025	$65,596
Ana-0850-090	51 ST	1442	1724	54 AVE	55 AVE	282	11.32269	LOC	N	RCLM	2038	$175,615
Ana-0860-010	51 ST CL	0	142	South End	34 AVE / 51 ST	142	11.8	LOC	Y			
Ana-0870-010	51A ST	0	217	South End	47 AVE	217	12.1	LOC	Y			
Ana-0880-010	52 AVE	0	118	56 ST	55 ST	118	11.1	COL	Y			
Ana-0880-020	52 AVE	118	237	55 ST	54 ST	119	12.4	COL	Y			
Ana-0880-030	52 AVE	237	354	54 ST	53 ST	117	13	COL	Y			
Ana-0880-040	52 AVE	355	512	53 ST	52 ST	157	13.6	COL	Y	MF50	2036	$68,260

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-0880-050	52 AVE	512	610	52 ST	51 ST	98	13	COL	Y	MF50	2036	$41,236
Ana-0880-060	52 AVE	610	720	51 ST	50 ST	110	13.2	COL	Y	MF50	2034	$46,419
Ana-0880-070	52 AVE	721	845	50 ST	49 ST	124	13.1	COL	Y			
Ana-0880-080	52 AVE	845	961	49 ST	48 ST	116	13.18362	COL	Y			
Ana-0880-090	52 AVE	961	1045	48 ST	47 ST / 48 ST	84	14.12857	COL	Y			
Ana-0880-100	52 AVE	1045	1196	47 ST / 48 ST	46 ST	151	14.48742	COL	Y			
Ana-0880-110	52 AVE	1196	1312	46 ST	45 ST / 52A AVE	116	12.075	COL	Y			
Ana-0890-010	52 ST	0	84	33 AVE	33A AVE	84	10.3	LOC	Y			
Ana-0890-020	52 ST	84	169	33A AVE	34 AVE	85	9.8	LOC	Y			
Ana-0890-030	52 ST	169	260	34 AVE	35 AVE	91	9.8	LOC	Y			
Ana-0890-040	52 ST	260	364	35 AVE	36 AVE	104	10	LOC	Y	MF50	2037	$33,532
Ana-0890-050	52 ST	365	599	North End	43 AVE	234	10.3	LOC	Y	MF50	2032	$78,246
Ana-0890-060	52 ST	599	739	43 AVE	44 AVE	140	9.3	LOC	Y	FDM	2035	$71,610
Ana-0890-070	52 ST	740	894	44 AVE	52A ST	154	9.2	LOC	Y			
Ana-0890-080	52 ST	894	1161	52A ST	46 AVE	267	9.4	LOC	Y	RECON	2035	$138,039
Ana-0890-090	52 ST	1161	1383	46 AVE	47 AVE	222	9.1	LOC	Y	MF50	2027	$65,051
Ana-0890-100	52 ST	1384	1524	South End	48A AVE	140	12.40077	LOC	Y			
Ana-0890-110	52 ST	1524	1696	48A AVE	49 AVE	172	12.5	LOC	Y	RECON	2030	$118,250
Ana-0890-120	52 ST	1696	1868	49 AVE	50 AVE	172	12.4	LOC	Y			
Ana-0890-130	52 ST	1868	2040	50 AVE	51 AVE	172	14.1	LOC	Y	MF50	2033	$85,852
Ana-0890-140	52 ST	2041	2231	52 AVE	53 AVE	190	11.1	LOC	Y			
Ana-0890-150	52 ST	2231	2334	53 AVE	53A AVE	103	10.9	LOC	Y			
Ana-0890-160	52 ST	2334	2434	53A AVE	54 AVE	100	10.8	LOC	Y			
Ana-0890-170	52 ST	2434	2639	54 AVE	North End	205	10.8	LOC	N	RCLM	2034	$121,770
Ana-0900-010	52A AVE	0	118	45 ST / 52 AVE	44 ST	118	10.4	LOC	Y			
Ana-0900-020	52A AVE	118	236	44 ST	43 ST	118	10.3	LOC	Y			
Ana-0900-030	52A AVE	236	353	43 ST	42 ST	117	10.4	LOC	Y			
Ana-0900-040	52A AVE	353	476	42 ST	41 ST	123	10.4	LOC	Y			
Ana-0910-010	52A ST	0	79	35 AVE	36 AVE	79	10	LOC	Y			
Ana-0910-020	52A ST	80	192	44 AVE	44A AVE	112	9.7	LOC	Y			
Ana-0910-030	52A ST	193	288	52 ST	45 AVE	95	5	LOC	N	RCLM	2033	$26,125
Ana-0910-040	52A ST	288	348	45 AVE	45A AVE	60	9.7	LOC	Y	RECON	2031	$32,010
Ana-0910-050	52A ST	349	521	48A AVE	49 AVE	172	10.6	LOC	Y	MF50	2025	$57,366
Ana-0910-060	52A ST	521	693	49 AVE	50 AVE	172	10.6	LOC	Y			
Ana-0910-070	52A ST	693	865	50 AVE	51 AVE	172	10.8	LOC	Y	RECON	2030	$102,168
Ana-0920-010	52B AVE	0	112	46 ST	45 ST	112	10.6	LOC	Y			
Ana-0920-020	52B AVE	112	230	45 ST	44 ST	118	11.3	LOC	Y			
Ana-0920-030	52B AVE	230	347	44 ST	43 ST	117	11.3	LOC	Y			
Ana-0920-040	52B AVE	347	465	43 ST	42 ST	118	11.3	LOC	Y			
Ana-0920-050	52B AVE	465	582	42 ST	41 ST	117	11.7	LOC	Y			
Ana-0930-010	52B ST	0	151	33A AVE	36 AVE	151	10.1	LOC	Y			
Ana-0940-010	53 AVE	0	243	67 ST	66 ST	243	10.1	LOC	Y	MF50	2029	$73,629
Ana-0940-020	53 AVE	244	421	64 ST	62 ST	177	10.3	LOC	Y	MF50	2028	$57,240
Ana-0940-030	53 AVE	422	478	West End	58 ST	56	12.8	LOC	Y			
Ana-0940-040	53 AVE	478	583	58 ST	57 ST	105	10.23524	LOC	Y	RECON	2032	$59,108
Ana-0940-050	53 AVE	583	701	57 ST	56 ST	118	10.79661	LOC	Y			
Ana-0940-060	53 AVE	701	818	56 ST	55 ST	117	10.4	LOC	Y			
Ana-0940-070	53 AVE	818	936	55 ST	54 ST	118	10.4	LOC	Y			
Ana-0940-080	53 AVE	936	1054	54 ST	53 ST	118	10.20339	LOC	Y			
Ana-0940-090	53 AVE	1054	1208	53 ST	52 ST	154	10.6	LOC	Y	MF50	2036	$54,158
Ana-0940-100	53 AVE	1208	1307	52 ST	51 ST	99	10.49899	LOC	Y	MF50	2028	$33,798
Ana-0940-110	53 AVE	1307	1407	51 ST	50 ST	100	10.4	LOC	Y	MF50	2025	$36,648
Ana-0940-120	53 AVE	1407	1525	50 ST	49 ST	118	10.80763	LOC	Y	RECON	2028	$70,141
Ana-0940-130	53 AVE	1525	1640	49 ST	48 ST	115	11.7	LOC	Y	MF50	2024	$48,607
Ana-0940-140	53 AVE	1640	1755	48 ST	47 ST	115	10.9	LOC	Y	RECON	2027	$68,942
Ana-0940-150	53 AVE	1755	1872	47 ST	46 ST	117	10.6	LOC	N			
Ana-0950-010	53 ST	1	330	PARKVIEW DR	43 AVE	329	8.7	ART	N	OL50	2031	$88,838
Ana-0950-020	53 ST	331	534	43 AVE	44 AVE	203	14.7	ART	Y	MF50	2032	$113,053
Ana-0950-030	53 ST	534	644	44 AVE	44A AVE	110	14	ART	Y	MF50	2028	$62,257
Ana-0950-040	53 ST	644	811	44A AVE	45A AVE	167	14.27066	ART	Y	MF50	2024	$80,849
Ana-0950-050	53 ST	811	950	45A AVE	46 AVE	139	14.7	ART	Y	MF50	2031	$79,001
Ana-0950-060	53 ST	950	1153	46 AVE	47 AVE	203	14.7	ART	Y	MF50	2033	$119,306
Ana-0950-070	53 ST	1153	1361	47 AVE	48 AVE WB	208	15.1	ART	Y	MF50	2029	$113,833
Ana-0950-080	53 ST	1362	1538	48A AVE	49 AVE	176	14.1	ART	Y	MF50	2033	$100,142
Ana-0950-090	53 ST	1538	1710	49 AVE	50 AVE	172	14.1	ART	Y	MF50	2032	$94,791
Ana-0950-100	53 ST	1710	1883	50 AVE	51 AVE	173	14.2	ART	Y	MF50	2033	$89,281
Ana-0950-110	53 ST	1883	2029	51 AVE	52 AVE	146	13.8	ART	Y	MF50	2034	$82,420
Ana-0950-120	53 ST	2029	2196	52 AVE	53 AVE	167	14.08563	ART	Y	MF50	2033	$93,658
Ana-0950-130	53 ST	2196	2298	53 AVE	53A AVE	102	14.1	ART	Y	MF50	2034	$58,833
Ana-0950-140	53 ST	2298	2399	53A AVE	54 AVE	101	13.9	ART	Y	MF50	2033	$54,364
Ana-0950-150	53 ST	2399	2603	54 AVE	55 AVE	204	17.27353	ART	Y	MF50	2033	$136,454
Ana-0950-160	53 ST	2603	3606	55 AVE	HWY 833	1003	14.6	ART	N	OL50	2031	$476,115
Ana-0960-010	53 ST_SB	0	321	NO NAME	North End	321	9.7	ART	N	OL50	2031	$100,919
Ana-0970-020	53A AVE	56	210	53 ST	52 ST	154	10.7	LOC	Y			
Ana-0980-010	53A ST	0	107	48A AVE	North End	107	14.9	LOC	Y			
Ana-0990-010	54 AVE	0	76	68 ST	67 ST	76	12.3	COL	Y	MF50	2026	$40,678
Ana-0990-020	54 AVE	76	213	67 ST	66 ST	137	12.2	COL	Y	MF50	2025	$63,382
Ana-0990-030	54 AVE	213	308	66 ST	65 ST	95	12	COL	Y	FDM	2037	$74,100
Ana-0990-040	54 AVE	308	390	65 ST	64 ST	82	12	COL	Y	MF50	2037	$39,844
Ana-0990-050	54 AVE	390	468	64 ST	63 ST	78	12.4	COL	Y			
Ana-0990-060	54 AVE	468	691	63 ST	62 ST	223	12.5	COL	Y	FDM	2037	$181,188
Ana-0990-070	54 AVE	691	788	62 ST	61 ST CL	97	12.5	COL	Y			
Ana-0990-080	54 AVE	788	1009	61 ST CL	60 ST	221	12.19955	COL	Y			
Ana-0990-090	54 AVE	1009	1176	60 ST	58 ST	167	12.1	COL	Y			
Ana-0990-100	54 AVE	1176	1475	58 ST	56 ST	299	12.40167	COL	Y			
Ana-0990-110	54 AVE	1475	1592	56 ST	55 ST	117	12.9	COL	Y			
Ana-0990-120	54 AVE	1592	1710	55 ST	54 ST	118	13	COL	Y			
Ana-0990-130	54 AVE	1710	1827	54 ST	53 ST	117	13	COL	Y			
Ana-0990-140	54 AVE	1827	1982	53 ST	52 ST	155	12.6	COL	Y	MF50	2020	$80,064
Ana-0990-150	54 AVE	1982	2080	52 ST	51 ST	98	12.2	COL	Y	MF50	2020	$49,479
Ana-0990-160	54 AVE	2080	2180	51 ST	50 ST	100	12.2	COL	Y	MF50	2020	$52,287
Ana-0990-170	54 AVE	2180	2433	50 ST	NO NAME	253	12.9	COL	Y	MF50	2020	$115,786
Ana-0990-180	54 AVE	2433	2476	NO NAME	48 ST	43	12.9	COL	Y	MF50	2020	$17,216
Ana-0990-190	54 AVE	2476	2528	48 ST	47 ST	52	12	COL	Y	MF50	2020	$19,005
Ana-0990-200	54 AVE	2528	2645	47 ST	46 ST	117	12.3	COL	N	OL50	2038	$57,765
Ana-1000-010	54 ST	0	271	45 AVE	46 AVE	271	10.9	LOC	Y			
Ana-1000-020	54 ST	272	469	47 AVE	48 AVE	197	10.8	LOC	Y			
Ana-1000-030	54 ST	470	642	48A AVE	49 AVE	172	10.6	LOC	Y	MF50	2035	$61,496
Ana-1000-040	54 ST	642	815	49 AVE	50 AVE	173	10.7	LOC	Y			
Ana-1000-050	54 ST	815	987	50 AVE	51 AVE	172	10.8	LOC	Y			
Ana-1000-070	54 ST	1040	1190	52 AVE	53 AVE	150	10.5	LOC	Y			
Ana-1000-080	54 ST	1190	1392	53 AVE	54 AVE	202	10.4	LOC	Y			
Ana-1010-010	54A AVE	0	103	62 ST	61 ST CL	103	9.3	LOC	Y			
Ana-1010-020	54A AVE	103	240	61 ST CL	60 ST	137	9.1	LOC	Y			
Ana-1010-030	54A AVE	241	307	59 ST	58 ST	66	9.1	LOC	Y			
Ana-1010-040	54A AVE	308	355	50 ST	NO NAME	47	11.5	LOC	N			
Ana-1020-010	54B AVE	0	65	59 ST	58 ST	65	9.4	LOC	Y			
Ana-1030-010	55 AVE	0	50	South End	66 ST	50	17.2	LOC	Y			
Ana-1030-020	55 AVE	50	180	66 ST	65 ST	130	10	LOC	Y			
Ana-1030-030	55 AVE	181	298	64 ST	63 ST	117	12.5	LOC	Y	MF50	2030	$45,484
Ana-1030-040	55 AVE	299	464	55 AVE CL / 60 ST	58 ST	165	9.2	LOC	Y			
Ana-1030-060	55 AVE	516	613	51 ST	50 ST	97	13.2	LOC	Y			
Ana-1030-070	55 AVE	613	700	50 ST	49 ST	87	10.9	LOC	Y			
Ana-1030-080	55 AVE	700	962	49 ST	47 ST	262	10.9	LOC	Y	RECON	2030	$157,069
Ana-1040-010	55 AVE CL	0	56	NO NAME	55 AVE / 60 ST	56	15.1	LOC	Y			
Ana-1050-010	55 ST	0	85	28 AVE	28A AVE CL	85	12.2	LOC	Y			
Ana-1050-020	55 ST	86	343	PARKVIEW DR	43 AVE	257	11.8	COL	Y	FDM	2038	$197,119

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-1050-030	55 ST	343	494	43 AVE	44 AVE	151	10.8	COL	Y			
Ana-1050-040	55 ST	495	627	South End	45 AVE	132	11	LOC	Y			
Ana-1050-050	55 ST	628	836	47 AVE	North End	208	10.8	LOC	Y			
Ana-1050-060	55 ST	837	974	52 AVE	53 AVE	137	10.8	LOC	Y			
Ana-1050-070	55 ST	974	1176	53 AVE	54 AVE	202	10.9	LOC	Y			
Ana-1060-010	56 ST	0	59	23 AVE	23A AVE CL	59	13.2	LOC	Y			
Ana-1060-020	56 ST	59	152	23A AVE CL	24 AVE CL	93	10.3	LOC	Y			
Ana-1060-030	56 ST	152	244	24 AVE CL	25 AVE	92	10.5	LOC	Y			
Ana-1060-040	56 ST	244	333	25 AVE	26 AVE CL	89	10.8	LOC	Y			
Ana-1060-050	56 ST	333	439	26 AVE CL	27 AVE CL	106	10.6	LOC	Y			
Ana-1060-060	56 ST	439	570	27 AVE CL	28 AVE	131	10.5	LOC	Y			
Ana-1060-070	56 ST	571	774	46 AVE	47 AVE	203	10.8	LOC	Y			
Ana-1060-080	56 ST	774	913	47 AVE	47A AVE	139	10.8	LOC	Y			
Ana-1060-090	56 ST	913	982	47A AVE	48 AVE WB	69	11.3	LOC	Y			
Ana-1060-100	56 ST	983	1026	South End	49 AVE	43	7.5	LOC	N			
Ana-1060-110	56 ST	1026	1199	49 AVE	50 AVE	173	10.7	LOC	Y			
Ana-1060-120	56 ST	1199	1371	50 AVE	51 AVE	172	10.8	LOC	Y			
Ana-1060-140	56 ST	1444	1485	South End	52 AVE	41	11.4	LOC	Y			
Ana-1060-150	56 ST	1485	1605	52 AVE	53 AVE	120	10.5	LOC	Y			
Ana-1060-160	56 ST	1605	1707	53 AVE	53A AVE	102	10.7	LOC	Y			
Ana-1060-170	56 ST	1707	1807	53A AVE	54 AVE	100	10.7	LOC	Y			
Ana-1070-010	56 ST CL	0	80	South End	39 AVE	80	14.8	LOC	Y			
Ana-1080-010	56A ST CL	1	117	39 AVE	Northeast End	116	13.4	LOC	Y	RECON	2033	$85,492
Ana-1090-010	57 ST	0	44	23 AVE	24 AVE CL	44	10.2	LOC	Y			
Ana-1090-020	57 ST	44	185	24 AVE CL	25 AVE	141	10.5	LOC	Y			
Ana-1090-030	57 ST	185	419	25 AVE	28 AVE	234	10.4	LOC	Y			
Ana-1090-040	57 ST	419	506	28 AVE	28A AVE CL	87	11	LOC	Y			
Ana-1090-050	57 ST	507	666	ENEVOLD DR	35 AVE	159	11.8	LOC	Y			
Ana-1090-060	57 ST	666	749	35 AVE	36 AVE	83	13.8	LOC	Y	MF50	2036	$36,063
Ana-1090-070	57 ST	750	847	39 AVE	MARLER DR	97	10.4	LOC	Y	MF50	2020	$32,439
Ana-1090-080	57 ST	848	1048	46 AVE	47 AVE	200	10.9	LOC	Y			
Ana-1090-090	57 ST	1049	1090	South End	49 AVE	41	9.4	LOC	Y			
Ana-1090-100	57 ST	1090	1263	49 AVE	50 AVE	173	10.7	LOC	Y			
Ana-1090-110	57 ST	1263	1349	50 AVE	50A AVE	86	10.6	LOC	Y	MF50	2031	$28,326
Ana-1090-120	57 ST	1349	1435	50A AVE	51 AVE	86	10.6	LOC	Y			
Ana-1090-130	57 ST	1435	1534	51 AVE	North End	99	10.5	LOC	Y			
Ana-1090-140	57 ST	1535	1668	South End	53 AVE	133	13.3	LOC	Y			
Ana-1100-010	58 ST	0	72	36 AVE	37 AVE CL	72	10.5	LOC	Y			
Ana-1100-020	58 ST	72	154	37 AVE CL	MOUNT PLEASANT DR	82	10.4	LOC	Y			
Ana-1100-030	58 ST	154	251	MOUNT PLEASANT DR	38 AVE CL	97	10.8	LOC	Y			
Ana-1100-040	58 ST	251	472	38 AVE CL	39 AVE / 39 AVE CL	221	10.5	LOC	Y			
Ana-1100-050	58 ST	473	548	48 AVE	48A AVE	75	9.289394	LOC	Y			
Ana-1100-060	58 ST	548	587	48A AVE	48B AVE	39	8.6	LOC	Y	MF50	2039	$10,643
Ana-1100-070	58 ST	588	757	49 AVE	50 AVE / GRAND DR	169	10.2	LOC	Y			
Ana-1100-080	58 ST	757	929	50 AVE / GRAND DR	51 AVE	172	10.8	LOC	Y			
Ana-1100-090	58 ST	929	1030	51 AVE	North End	101	10.9	LOC	Y			
Ana-1100-110	58 ST	1118	1222	54 AVE	54A AVE	104	9.4	LOC	Y			
Ana-1100-120	58 ST	1222	1319	54A AVE	54B AVE	97	8.806186	LOC	Y			
Ana-1100-130	58 ST	1319	1418	54B AVE	55 AVE	99	9.4	LOC	Y			
Ana-1110-010	58 ST CL	0	61	ENEVOLD DR	North End	61	16.5	LOC	Y			
Ana-1110-020	58 ST CL	62	224	42 AVE	Southeast End	162	10.6	LOC	Y	RECON	2032	$94,446
Ana-1110-030	58 ST CL	225	436	53 AVE	Southwest End	211	10	LOC	Y			
Ana-1120-010	59 ST	46	142	MARLER DR	41 AVE	96	9.8	LOC	Y			
Ana-1120-020	59 ST	143	236	43 AVE	44 AVE	93	9.1	LOC	Y	MF50	2029	$28,602
Ana-1120-030	59 ST	237	332	54A AVE	54B AVE	95	9.9	LOC	Y			
Ana-1130-010	59 ST CL	0	70	South End	28 AVE	70	13.6	LOC	Y			
Ana-1130-020	59 ST CL	71	131	ENEVOLD DR	North End	60	16.9	LOC	Y			
Ana-1130-030	59 ST CL	132	273	Southwest End	MARLER DR	141	13.43617	LOC	Y	RECON	2025	$104,198
Ana-1130-040	59 ST CL	274	422	42 AVE	North End	148	10.6	LOC	Y			
Ana-1140-010	60 ST	0	124	41 AVE	42 AVE	124	10.5	LOC	Y			
Ana-1140-020	60 ST	125	165	South End	48A AVE	40	9.6	LOC	Y	RECON	2034	$21,120
Ana-1140-030	60 ST	165	255	48A AVE	48B AVE	90	8.9	LOC	Y			
Ana-1140-040	60 ST	256	472	South End	54 AVE	216	11.50509	LOC	Y			
Ana-1140-050	60 ST	472	574	54 AVE	54A AVE	102	12.6	COL	Y			
Ana-1140-060	60 ST	574	772	54A AVE	55 AVE / 55 AVE CL	198	12.5	COL	Y	MF50	2035	$92,134
Ana-1140-070	60 ST	772	789	55 AVE / 55 AVE CL		17	12.3	COL	Y			
Ana-1150-010	60 ST CL	0	45	South End	28 AVE	45	15.5	LOC	Y	MF50	2029	$20,925
Ana-1150-020	60 ST CL	46	127	42 AVE	NO NAME	81	23.1	LOC	Y	RECON	2029	$102,911
Ana-1160-010	600 PARKRIDGE CL	0	51	PARKRIDGE DR / PARKRIDGE DR_1	NO NAME	51	17.1	LOC	Y			
Ana-1170-010	61 ST	0	103	45 AVE	MONTJOY AVE	103	8.9	LOC	Y	MF50	2028	$29,003
Ana-1170-020	61 ST	103	329	MONTJOY AVE	47 AVE	226	8.6	LOC	Y			
Ana-1170-030	61 ST	329	423	47 AVE	47A AVE	94	8.5	LOC	Y			
Ana-1180-010	61 ST CL	0	51	28 AVE	Northwest End	51	13.99	LOC	Y			
Ana-1180-020	61 ST CL	52	109	Southwest End	54 AVE	57	15.9	LOC	Y			
Ana-1180-030	61 ST CL	110	148	54A AVE	Northeast End	38	28.2	LOC	Y			
Ana-1190-010	61A ST	0	162	30 AVE	32 AVE	162	10	LOC	Y			
Ana-1190-020	61A ST	162	256	32 AVE	ENEVOLD DR	94	9.7	LOC	Y			
Ana-1190-030	61A ST	256	354	ENEVOLD DR	61A ST_1	98	9.5	LOC	Y			
Ana-1190-040	61A ST	354	427	61A ST_1	35 AVE	73	8.9	LOC	Y			
Ana-1200-010	61A ST_1	0	29	West End	61A ST	29	35	LOC	Y			
Ana-1210-010	62 ST	0	124	VALLEYVIEW DR	24 AVE	124	13.26	COL	N			
Ana-1210-020	62 ST	124	272	24 AVE	26 AVE	148	13.15	COL	N			
Ana-1210-030	62 ST	272	396	26 AVE	28 AVE	124	12.65	COL	N			
Ana-1210-040	62 ST	396	532	28 AVE	CAMROSE DR	136	19.88	COL	Y			
Ana-1210-050	62 ST	533	765	ERICKSON DR	39 AVE	232	9	LOC	Y			
Ana-1210-060	62 ST	766	1048	East End	42 AVE	282	10.8	LOC	Y			
Ana-1210-070	62 ST	1049	1121	NO NAME	43 AVE	72	20.7	LOC	Y			
Ana-1210-080	62 ST	1122	1241	44B AVE	45 AVE	119	9.9	LOC	Y			
Ana-1210-090	62 ST	1242	1331	53 AVE	54 AVE	89	10.4	LOC	Y			
Ana-1210-100	62 ST	1331	1426	54 AVE	54A AVE	95	9.608421	LOC	Y	RECON	2034	$50,204
Ana-1210-110	62 ST	1426	1506	54A AVE	Northeast End	80	14.23188	LOC	Y			
Ana-1220-010	62 ST CL	0	152	30 AVE	Northwest End	152	14.7	LOC	Y			
Ana-1230-010	62A ST	0	118	30 AVE	ELLIOTT DR	118	10.4	LOC	Y			
Ana-1230-020	62A ST	119	171	NO NAME	ENEVOLD DR	52	10.4	LOC	Y	MF50	2035	$18,932
Ana-1240-010	63 ST	0	95	26 AVE	27 AVE	95	9.22	LOC	N			
Ana-1240-020	63 ST	95	168	27 AVE	28 AVE	73	9.32	LOC	N			
Ana-1240-030	63 ST	169	254	30 AVE	63 ST CL / ELLIOTT DR	85	9.6	LOC	Y			
Ana-1240-040	63 ST	255	350	63 ST CL / ERICKSON DR	38 AVE CL	95	9.1	LOC	Y			
Ana-1240-050	63 ST	350	532	38 AVE CL	39 AVE	182	9.1	LOC	Y			
Ana-1240-060	63 ST	532	633	39 AVE	MARLER DR	101	8.8	LOC	Y			
Ana-1240-070	63 ST	633	735	MARLER DR	41 AVE	102	9	LOC	Y			
Ana-1240-080	63 ST	735	799	41 AVE	42 AVE	64	9.4	LOC	Y	RECON	2033	$33,088
Ana-1240-090	63 ST	800	880	NO NAME	43 AVE	80	22.7	LOC	Y			
Ana-1240-100	63 ST	881	976	43 AVE	43A AVE CL	95	9.1	LOC	Y			
Ana-1240-110	63 ST	976	1115	43A AVE CL	44A AVE	139	9.2	LOC	Y			
Ana-1240-120	63 ST	1115	1203	44A AVE	44B AVE	88	9.1	LOC	Y			
Ana-1240-130	63 ST	1204	1300	54 AVE	55 AVE	96	11.3	LOC	Y			
Ana-1250-010	63 ST CL	0	117	63 ST / ELLIOTT DR	North End	117	14.06923	LOC	Y			
Ana-1250-020	63 ST CL	118	182	NO NAME	63 ST / ERICKSON DR	64	13.8	LOC	Y	MF50	2035	$28,340
Ana-1260-010	64 ST	0	170	32 AVE	35 AVE	170	10.1	LOC	Y	MF50	2029	$51,510
Ana-1260-020	64 ST	171	352	Northeast End	39 AVE	181	12.3	LOC	Y			
Ana-1260-030	64 ST	353	459	N 48 AVE SERVICE RD	48A AVE	106	9.1	LOC	N	RCLM	2033	$53,053
Ana-1260-040	64 ST	459	553	48A AVE	48B AVE	94	9.2	LOC	Y			
Ana-1260-050	64 ST	553	594	48B AVE	49 AVE	41	8.8	LOC	Y	MF50	2027	$12,285
Ana-1260-060	64 ST	594	648	49 AVE	49 AVE	54	9.1	LOC	Y	MF50	2038	$16,785
Ana-1260-070	64 ST	648	695	49 AVE	50 AVE	47	9.1	LOC	Y			
Ana-1260-080	64 ST	696	787	53 AVE	54 AVE	91	10.4	LOC	Y			

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-1260-090	64 ST	787	884	54 AVE	55 AVE	97	10.6	LOC	Y			
Ana-1270-010	64 ST CL	0	65	ENEVOLD DR	North End	65	16.36	LOC	Y			
Ana-1270-020	64 ST CL	66	157	NO NAME	43 AVE	91	14.2	LOC	Y	RECON	2029	$71,071
Ana-1280-010	65 ST	0	309	38 AVE / 66 ST	MARLER DR	309	10.5	COL	Y	FDM	2026	$210,893
Ana-1280-020	65 ST	309	563	MARLER DR	43 AVE	254	12.1	COL	Y	MF50	2023	$97,105
Ana-1280-030	65 ST	563	885	43 AVE	44B AVE	322	12	COL	Y	MF50	2035	$147,879
Ana-1280-040	65 ST	885	976	44B AVE	45 AVE	91	11.7	COL	Y	MF50	2038	$44,430
Ana-1280-050	65 ST	976	1067	45 AVE	45A AVE	91	11.8	COL	Y	MF50	2037	$43,199
Ana-1280-060	65 ST	1067	1155	45A AVE	46 AVE	88	12.1	COL	Y	MF50	2035	$32,246
Ana-1280-070	65 ST	1155	1486	46 AVE	S 48TH AVE SERVICE RD	331	14.3	COL	Y	MF50	2036	$147,856
Ana-1280-080	65 ST	1486	1509	S 48TH AVE SERVICE RD	48 AVE	23	14.3	COL	Y	MF50	2034	$10,059
Ana-1280-090	65 ST	1510	1587	50 AVE	50A AVE	77	11.2	LOC	Y			
Ana-1280-100	65 ST	1588	1685	54 AVE	55 AVE	97	12.2	LOC	Y			
Ana-1290-010	65A ST	0	79	50 AVE	50A AVE	79	10.3	LOC	Y			
Ana-1300-010	66 ST	0	172	66A ST	38 AVE / 65 ST	172	10.4	COL	Y	MF50	2023	$66,379
Ana-1300-020	66 ST	173	291	42 AVE	43 AVE	118	9.7	LOC	Y			
Ana-1300-030	66 ST	291	344	43 AVE	43 AVE	53	8.907547	LOC	Y			
Ana-1300-040	66 ST	344	440	43 AVE	44 AVE	96	9.3	LOC	Y			
Ana-1300-050	66 ST	440	591	44 AVE	44B AVE	151	9.3	LOC	Y			
Ana-1300-060	66 ST	592	680	44B AVE	45 AVE	88	9.1	LOC	Y			
Ana-1300-070	66 ST	686	940	48 AVE WB	49 AVE	254	13.22598	COL	Y	MF50	2020	$106,486
Ana-1300-080	66 ST	940	1047	49 AVE	50 AVE	107	11.1	COL	Y	MF50	2020	$38,477
Ana-1300-090	66 ST	1047	1312	50 AVE	GOLF COURSE	265	11	LOC	Y	RECON	2034	$160,325
Ana-1300-100	66 ST	1314	1412	55 AVE	54 AVE	98	9.7	LOC	Y			
Ana-1300-110	66 ST	1412	1503	54 AVE	53 AVE	91	10.1	LOC	Y			
Ana-1310-010	66 ST CL	0	48	South End	31 AVE	48	18.5	LOC	Y			
Ana-1310-020	66 ST CL	49	92	45 AVE	North End	43	27	LOC	Y			
Ana-1320-010	66A ST	0	140	ENEVOLD DR	66 ST	140	11.4	COL	Y	MF50	2022	$55,699
Ana-1320-020	66A ST	141	227	44 AVE	NO NAME	86	17.1	LOC	Y			
Ana-1330-010	67 ST	0	108	30 AVE	31 AVE	108	10.2	LOC	Y			
Ana-1330-020	67 ST	109	196	32 AVE	33 AVE	87	11	LOC	Y			
Ana-1330-030	67 ST	196	285	33 AVE	34 AVE	89	9.1	LOC	Y			
Ana-1330-040	67 ST	285	370	34 AVE	35 AVE	85	9.9	LOC	Y	RECON	2035	$46,282
Ana-1330-050	67 ST	371	529	38 AVE	67 ST_1	158	9.1	LOC	Y	FDM	2034	$79,079
Ana-1330-060	67 ST	529	632	67 ST_1	MARLER DR	103	9	LOC	Y	FDM	2035	$50,985
Ana-1330-070	67 ST	632	733	MARLER DR	42 AVE	101	9	LOC	Y	RECON	2026	$49,995
Ana-1330-080	67 ST	733	901	42 AVE	43 AVE	168	8.9	LOC	Y	MF50	2027	$53,223
Ana-1330-090	67 ST	902	1095	44 AVE	44B AVE	193	9.5	LOC	Y			
Ana-1330-100	67 ST	1096	1254	45 AVE	NO NAME	158	11.5	LOC	Y			
Ana-1330-110	67 ST	1255	1345	53 AVE	54 AVE	90	11.1	LOC	Y			
Ana-1340-010	67 ST_1	0	207	38 AVE	67 ST	207	9.1	LOC	Y	MF50	2034	$63,471
Ana-1350-010	68 ST	0	102	CAMROSE DR / RGE RD 204	NO NAME	102	9.8	ART	Y			
Ana-1350-020	68 ST	102	587	NO NAME	NO NAME	485	9.8	ART	Y	MF50	2037	$162,164
Ana-1350-030	68 ST	587	1132	NO NAME	NO NAME	545	10.07963	ART	Y	MF50	2037	$187,425
Ana-1350-040	68 ST	1132	1203	NO NAME	MARLER DR	71	10.1	ART	Y	MF50	2039	$24,466
Ana-1350-050	68 ST	1203	1765	MARLER DR		562	9.4	ART	Y	MF50	2031	$160,597
Ana-1350-060	68 ST	1765	1865		45 AVE	100	9.4	ART	Y	MF50	2038	$32,721
Ana-1350-070	68 ST	1865	2367	45 AVE	48 AVE	502	11.1	ART	Y	MF50	2033	$223,641
Ana-1350-080	68 ST	2367	2794	48 AVE	50 AVE	427	13.6	ART	Y	FDM	2023	$435,540
Ana-1350-090	68 ST	2796	3208	Southwest End		412	14.42184	ART	Y	MF50	2033	$236,146
Ana-1350-100	68 ST	3208	3593		54 AVE	385	13.4	ART	Y	MF50	2021	$178,900
Ana-1360-010	68 ST SB	0	169	South End	45 AVE	169	6.5	ART	Y	MF50	2032	$43,176
Ana-1360-020	68 ST SB	169	671	45 AVE	48 AVE	502	10.5	ART	Y	MF50	2029	$193,018
Ana-1360-030	68 ST SB	671	1105	48 AVE	50 AVE	434	12.9	ART	Y	MF50	2023	$218,295
Ana-1370-010	68A ST	0	127	37A AVE	38 AVE	127	9.9	LOC	Y			
Ana-1380-010	69 ST	0	40	South End	37A AVE	40	10.4	COL	Y	MF50	2030	$12,723
Ana-1380-020	69 ST	40	142	37A AVE	38 AVE	102	10.3	COL	Y	MF50	2035	$33,587
Ana-1380-030	69 ST	142	217	38 AVE	38 AVE / 69A ST CL	75	10	COL	Y	MF50	2024	$22,500
Ana-1380-040	69 ST	217	301	38 AVE / 69A ST CL	39 AVE CL	84	10.80357	COL	Y	MF50	2036	$29,012
Ana-1380-050	69 ST	301	395	39 AVE CL	40 AVE CL	94	11.1	COL	Y	MF50	2036	$33,772
Ana-1380-060	69 ST	395	492	40 AVE CL	MARLER DR	97	11.7	COL	Y	MF50	2036	$48,328
Ana-1380-070	69 ST	492	590	MARLER DR	42 AVE	98	11.09796	COL	Y	MF50	2036	$44,537
Ana-1380-080	69 ST	590	664	42 AVE	42A AVE	74	10.9	COL	Y	MF50	2022	$24,198
Ana-1380-090	69 ST	664	824	42A AVE	43 AVE / 70 ST	160	11.1	COL	Y	MF50	2022	$53,280
Ana-1380-110	69 ST	1079	1256	45 AVE	46 AVE	177	10.6	LOC	Y			
Ana-1380-120	69 ST	1257	1341	49A AVE	50 AVE	84	10	LOC	Y			
Ana-1390-010	69A ST CL	0	122	38 AVE / 69 ST	Northwest End	122	11.4	LOC	Y			
Ana-1390-020	69A ST CL	123	222	South End	MARLER DR	99	13.1	LOC	Y			
Ana-1400-010	70 ST	0	43	38 AVE	Northwest End	43	14.8	LOC	Y			
Ana-1400-020	70 ST	44	106	South End	43 AVE / 69 ST	62	16.3	LOC	Y			
Ana-1400-030	70 ST	107	199	50 AVE	51 AVE	92	9.7	LOC	Y			
Ana-1410-010	71 ST	0	124	42 AVE	43 AVE	124	10.4	LOC	Y	MF50	2034	$39,220
Ana-1410-020	71 ST	124	272	43 AVE	North End	148	10.73311	LOC	Y			
Ana-1410-030	71 ST	273	367	49A AVE	50 AVE	94	9.7	LOC	Y			
Ana-1410-040	71 ST	367	459	50 AVE	51 AVE	92	9.9	LOC	Y			
Ana-1420-010	71 ST CL	0	64	South End	38 AVE	64	13.5	LOC	Y			
Ana-1420-020	71 ST CL	65	168	South End	46 AVE	103	11.6	LOC	Y	RECON	2035	$65,714
Ana-1430-010	72 ST	1	107	42 AVE	43 AVE	106	9.5	LOC	Y	RECON	2028	$55,385
Ana-1430-020	72 ST	108	167	43 AVE	North End	59	19.3	LOC	Y			
Ana-1440-010	72 ST CL	0	23	South End	38 AVE	23	18.7	LOC	Y			
Ana-1450-010	73 ST	0	130	MARLER DR	42 AVE CL	130	14.2	COL	Y	MF50	2036	$59,750
Ana-1450-020	73 ST	130	237	42 AVE CL	43 AVE	107	13.8	COL	Y	MF50	2035	$47,206
Ana-1450-030	73 ST	237	381	43 AVE	44 AVE / 44 AVE CL	144	13.7	COL	Y	FDM	2038	$128,232
Ana-1450-040	73 ST	381	467	44 AVE / 44 AVE CL	44A AVE CL	86	15	COL	Y			
Ana-1450-050	73 ST	467	591	44A AVE CL	44B AVE	124	14.5	COL	Y			
Ana-1450-060	73 ST	591	692	44B AVE	45 AVE	101	12.7	COL	Y			
Ana-1450-070	73 ST	692	814	45 AVE	46 AVE	122	10.4	COL	Y	MF50	2025	$40,837
Ana-1450-080	73 ST	814	1157	46 AVE	48 AVE	343	15.2	COL	Y	FDM	2039	$338,884
Ana-1450-090	73 ST	1157	1483	48 AVE	North End	326	13.8	COL	Y	MF50	2026	$170,755
Ana-1460-010	73A ST	0	104	45 AVE	46 AVE	104	9.5	LOC	Y			
Ana-1470-010	74 ST	0	79	NO NAME	43 AVE	79	14.1	LOC	Y			
Ana-1470-020	74 ST	79	148	43 AVE	North End	69	15.05217	LOC	Y			
Ana-1470-030	74 ST	149	374	44 AVE	44B AVE	225	9	LOC	Y			
Ana-1470-040	74 ST	375	478	45 AVE	46 AVE	103	8.9	LOC	Y			
Ana-1480-010	75 ST	0	83	38 AVE / MARLER DR	37A AVE	83	10.2	COL	Y	MF50	2025	$25,398
Ana-1480-020	75 ST	83	162	37A AVE	38A AVE	79	10	COL	Y	MF50	2023	$23,700
Ana-1480-030	75 ST	162	251	38A AVE	39 AVE	89	10.2	COL	Y	MF50	2024	$27,234
Ana-1480-040	75 ST	251	339	39 AVE	40 AVE	88	10.2	COL	Y	MF50	2024	$26,928
Ana-1480-050	75 ST	339	436	40 AVE	41 AVE	97	10.4	COL	Y	MF50	2035	$32,250
Ana-1480-060	75 ST	436	549	41 AVE	42 AVE	113	11.1	COL	Y	FDM	2029	$81,530
Ana-1480-070	75 ST	549	715	42 AVE	43 AVE	166	10.6	COL	Y	MF50	2024	$52,788
Ana-1480-080	75 ST	715	825	43 AVE	North End	110	13.47364	LOC	Y			
Ana-1480-090	75 ST	826	1051	44 AVE	44B AVE	225	9.1	LOC	Y			
Ana-1480-100	75 ST	1052	1155	45 AVE	46 AVE	103	9.7	LOC	Y			
Ana-1490-010	76 ST	0	75	37A AVE	38A AVE	75	11.6	LOC	Y			
Ana-1490-020	76 ST	76	165	39 AVE	40 AVE	89	11.7	LOC	Y			
Ana-1500-010	ARENA PARKING LOT ACCESS RD	0	140	44 AVE	45 AVE	140	14.4	LOC	Y			
Ana-1510-010	AUGUSTANA DORMES	1	546	50 ST	South End	545	5	LOC	N			
Ana-1520-010	AUGUSTANA S	0	161	South End	46 AVE	161	19	LOC	Y			
Ana-1530-010	BLANK_1	1	131	NO NAME	45 AVE	130	11.2	LOC	Y			
Ana-1540-010	CAMROSE DR	0	117	68 ST / RGE RD 204	NO NAME	117	9.8	ART	Y			
Ana-1540-020	CAMROSE DR	117	585	NO NAME	62 ST	468	9.8	ART	Y	MF50	2032	$180,043
Ana-1540-030	CAMROSE DR	585	1233	62 ST	PARKVIEW DR SB / VALLEYVIEW DR SB	648	9.8	ART	Y	MF50	2033	$253,380
Ana-1540-040	CAMROSE DR	1233	2436	PARKVIEW DR SB / VALLEYVIEW DR SB	50 ST	1203	11	ART	Y	MF50	2030	$487,912
Ana-1540-050	CAMROSE DR	2437	2598	50 ST / NO NAME	NO NAME	161	11.9	ART	N	OL50	2029	$58,128
Ana-1540-060	CAMROSE DR	2598	3343	NO NAME	NO NAME	745	9.4949	ART	Y	MF50	2032	$274,058

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-1540-070	CAMROSE DR	3343	3574	NO NAME	39 ST (NEW SALEM RD) / NO NAME	231	8.5	ART	Y	MF50	2033	$78,386
Ana-1540-080	CAMROSE DR	3575	4971	39 ST / 39 ST (NEW SALEM RD) / NO NAME	EXHIBITION DR / GRAVEL PIT RD	1396	13.8	ART	N	OL50	2022	$600,817
Ana-1540-090	CAMROSE DR	4971	5275	EXHIBITION DR / GRAVEL PIT RD	NO NAME	304	14.7	ART	N	OL50	2024	$143,198
Ana-1540-100	CAMROSE DR	5275	5772	NO NAME	HIGHWAY 13	497	14.7	ART	N	OL50	2024	$245,673
Ana-1550-010	COMP RD	0	476	45 AVE	S 48TH AVE SERVICE RD	476	11.9	COL	Y	MF50	2024	$246,166
Ana-1550-020	COMP RD	476	507	S 48TH AVE SERVICE RD	48 AVE WB	31	11.9	COL	Y	MF50	2025	$16,310
Ana-1560-010	DRIED MEAT LAKE RD	0	161	Southeast End	NO NAME	161	9	ART	N	OL50	2028	$45,784
Ana-1560-020	DRIED MEAT LAKE RD	161	201	NO NAME	NO NAME	40	9	ART	N	OL50	2030	$9,998
Ana-1560-030	DRIED MEAT LAKE RD	201	336	NO NAME	HIGHWAY 13	135	9	ART	N	OL50	2029	$37,241
Ana-1580-010	EAST END 2	0	74	Southwest End	48 AVE	74	18	LOC	Y			
Ana-1590-010	EAST END 3	0	75	Southwest End	48 AVE	75	11.3	LOC	Y			
Ana-1600-010	EDGEWOOD DR	0	231	ENEVOLD DR	300 EDGEWOOD CL / 400 EDGEWOOD CL	231	11.3	LOC	Y			
Ana-1600-020	EDGEWOOD DR	231	467	300 EDGEWOOD CL / 400 EDGEWOOD CL	200 EDGEWOOD CL	236	11.6	LOC	Y			
Ana-1600-030	EDGEWOOD DR	467	549	200 EDGEWOOD CL	100 EDGEWOOD CL	82	11.8	LOC	Y			
Ana-1600-040	EDGEWOOD DR	549	646	100 EDGEWOOD CL	ENEVOLD DR	97	11.6	LOC	Y			
Ana-1610-010	ELLIOTT DR	0	95	ENEVOLD DR / ERICKSON DR	35 AVE	95	11.2	COL	Y	MF50	2034	$34,015
Ana-1610-020	ELLIOTT DR	95	344	35 AVE	32 AVE	249	11	COL	Y	MF50	2024	$95,389
Ana-1610-030	ELLIOTT DR	344	419	32 AVE	31 AVE	75	11	COL	Y			
Ana-1610-040	ELLIOTT DR	419	604	31 AVE	63 ST / 63 ST CL	185	10.8	COL	Y	MF50	2037	$77,769
Ana-1610-050	ELLIOTT DR	604	687	63 ST / 63 ST CL	62A ST	83	10.9	COL	Y			
Ana-1610-060	ELLIOTT DR	687	814	62A ST	32 AVE	127	11.2	COL	Y			
Ana-1610-070	ELLIOTT DR	815	908	32 AVE	ENEVOLD DR	93	11.3	COL	Y	MF50	2036	$40,451
Ana-1620-010	ENEVOLD DR	0	46	68 ST	NO NAME	46	16.1	COL	Y			
Ana-1620-020	ENEVOLD DR	46	105	NO NAME	66A ST	59	16.1	COL	Y			
Ana-1620-030	ENEVOLD DR	105	271	66A ST	ELLIOTT DR / ERICKSON DR	166	14.3	COL	Y			
Ana-1620-040	ENEVOLD DR	271	362	ELLIOTT DR / ERICKSON DR	64 ST CL	91	14	COL	Y	MF50	2038	$41,772
Ana-1620-050	ENEVOLD DR	362	655	64 ST CL	62A ST	293	14.5	COL	Y	MF50	2037	$165,394
Ana-1620-060	ENEVOLD DR	655	714	62A ST	ELLIOTT DR / ERICKSON DR	59	14.4	COL	Y			
Ana-1620-070	ENEVOLD DR	714	893	ELLIOTT DR / ERICKSON DR	61A ST	179	14.2	COL	Y	MF50	2038	$83,341
Ana-1620-080	ENEVOLD DR	893	985	61A ST	59 ST CL / EDGEWOOD DR	92	14.2	COL	Y	MF50	2026	$39,192
Ana-1620-090	ENEVOLD DR	985	1076	59 ST CL / EDGEWOOD DR	58 ST CL	91	14	COL	Y	RECON	2037	$171,990
Ana-1620-100	ENEVOLD DR	1076	1151	58 ST CL	57 ST	75	13.7	COL	Y	RECON	2037	$138,712
Ana-1620-110	ENEVOLD DR	1151	1284	57 ST	EDGEWOOD DR	133	14.5	COL	Y	MF50	2026	$62,697
Ana-1620-120	ENEVOLD DR	1284	1401	EDGEWOOD DR	PARKRIDGE DR_1 / PARKVIEW DR SB	117	14.3	COL	Y	MF50	2025	$55,286
Ana-1630-010	ERICKSON DR	0	109	ELLIOTT DR / ENEVOLD DR	37 AVE	109	11.2	COL	Y	FDM	2028	$79,352
Ana-1630-020	ERICKSON DR	109	250	37 AVE	63 ST / 63 ST CL	141	10.89787	COL	Y	FDM	2022	$99,879
Ana-1630-030	ERICKSON DR	250	347	63 ST / 63 ST CL	62 ST	97	10.6	COL	Y	FDM	2021	$66,833
Ana-1630-040	ERICKSON DR	347	666	62 ST	36 AVE	319	10.99937	COL	Y	FDM	2026	$228,072
Ana-1630-050	ERICKSON DR	666	746	36 AVE	35 AVE	80	10.7975	COL	Y	MF50	2035	$27,615
Ana-1630-060	ERICKSON DR	746	826	35 AVE	34 AVE	80	10.6	COL	Y			
Ana-1630-070	ERICKSON DR	826	913	34 AVE	ENEVOLD DR	87	11.3	COL	Y			
Ana-1640-010	EXHIBITION DR	0	446	CAMROSE DR	NO NAME	446	13.7	ART	N	OL50	2029	$167,058
Ana-1640-020	EXHIBITION DR	446	492	NO NAME	NO NAME	46	13.7	ART	N	OL50	2026	$17,344
Ana-1640-030	EXHIBITION DR	492	716	NO NAME	48 AVE / HIGHWAY 13	224	20	ART	N	OL50	2029	$142,948
Ana-1650-010	GOLF COURSE	0	104	66 ST	East End	104	6	LOC	N			
Ana-1660-010	GRAND DR	0	119	48 AVE WB	48A AVE / GRANDVIEW CRES	119	14.5	COL	Y			
Ana-1660-020	GRAND DR	119	213	48A AVE / GRANDVIEW CRES	48B AVE / GRANDVIEW CRES	94	11.6	COL	Y			
Ana-1660-030	GRAND DR	213	308	48B AVE / GRANDVIEW CRES	49 AVE	95	11.7	COL	Y			
Ana-1660-040	GRAND DR	308	367	49 AVE	GRAND PARK CRES	59	11.7	COL	Y			
Ana-1660-050	GRAND DR	367	933	GRAND PARK CRES	50 AVE / 58 ST	566	12.39965	COL	Y			
Ana-1670-010	GRAND PARK CRES	0	172	48 AVE	48B AVE	172	10.5	LOC	Y			
Ana-1670-020	GRAND PARK CRES	172	470	48B AVE	GRAND DR	298	9.1	LOC	Y			
Ana-1680-010	GRANDVIEW CRES	0	330	48A AVE / GRAND DR	48B AVE / GRAND DR	330	10	LOC	Y	RECON	2032	$181,500
Ana-1690-010	HIGHWAY 13	0	153	48 AVE / EXHIBITION DR	NO NAME	153	11.1	ART	N	RCLM	2022	$127,373
Ana-1690-020	HIGHWAY 13	153	496	NO NAME	48 AVE WB	343	11.1	ART	N	FDM	2023	$285,548
Ana-1690-030	HIGHWAY 13	496	833	48 AVE WB	CAMROSE DR	337	16.4	ART	N	OL50	2023	$197,459
Ana-1690-040	HIGHWAY 13	833	886	CAMROSE DR	NO NAME	53	16.32076	ART	N	RCLM	2022	$64,875
Ana-1690-050	HIGHWAY 13	886	1934	NO NAME	DRIED MEAT LAKE RD	1048	16.3	ART	N	OL50	2027	$564,530
Ana-1690-060	HIGHWAY 13	1934	1965	DRIED MEAT LAKE RD	Southeast End	31	19.1	ART	N	OL50	2021	$24,224
Ana-1700-010	HIGHWAY 26	0	961	48 AVE WB	RGE RD 201	961	12.6	ART	N	OL50	2025	$452,086
Ana-1700-020	HIGHWAY 26	961	1202	RGE RD 201	RGE RD 200	241	11.1	ART	N	OL50	2027	$86,689
Ana-1700-030	HIGHWAY 26	1202	1773	RGE RD 200	East End	571	10.7	ART	N	OL50	2026	$213,528
Ana-1710-010	MARLER DR	0	60	South End	38 AVE / 75 ST	60	11.8	COL	Y	MF50	2025	$21,240
Ana-1710-020	MARLER DR	60	132	38 AVE / 75 ST	North End	72	13.8	COL	Y			
Ana-1710-030	MARLER DR	133	259	41 AVE	73 ST	126	14.3	COL	Y	MF50	2024	$54,054
Ana-1710-040	MARLER DR	259	501	73 ST	69A ST CL	242	14.7	COL	Y	MF50	2036	$113,727
Ana-1710-050	MARLER DR	501	559	69A ST CL	69 ST	58	14.4	COL	Y			
Ana-1710-060	MARLER DR	559	680	69 ST	NO NAME	121	14.7	COL	Y	MF50	2024	$62,056
Ana-1710-070	MARLER DR	680	749	NO NAME	68 ST	69	14.7	COL	Y	FDM	2039	$65,929
Ana-1710-080	MARLER DR	749	927	68 ST	67 ST	178	15.5	COL	Y			
Ana-1710-090	MARLER DR	927	1092	67 ST	65 ST	165	14.4	COL	Y	FDM	2027	$154,440
Ana-1710-100	MARLER DR	1092	1344	65 ST	63 ST	252	14	COL	Y	MF50	2026	$118,093
Ana-1710-110	MARLER DR	1344	1670	63 ST	MOUNT PLEASANT DR	326	14.20061	COL	Y	MF50	2025	$160,868
Ana-1710-120	MARLER DR	1670	1810	MOUNT PLEASANT DR	59 ST CL	140	14.4	COL	Y	MF50	2024	$71,912
Ana-1710-130	MARLER DR	1810	1873	59 ST CL	59 ST	63	14.4	COL	Y	FDM	2025	$58,968
Ana-1710-140	MARLER DR	1873	2125	59 ST	57 ST	252	14.3	COL	Y	FDM	2025	$234,234
Ana-1710-150	MARLER DR	2125	2182	57 ST	42 AVE	57	14.3	COL	Y	MF50	2024	$28,730
Ana-1710-160	MARLER DR	2182	2282	42 AVE	43 AVE	100	14	COL	Y	FDM	2024	$91,000
Ana-1710-170	MARLER DR	2282	2375	43 AVE	PARKVIEW DR	93	17.1	COL	Y	MF50	2025	$59,572
Ana-1720-010	MONTCALM AVE	0	91	MOUNT PLEASANT DR	MONTROSE AVE	91	8.8	LOC	Y			
Ana-1720-020	MONTCALM AVE	91	584	MONTROSE AVE	MOUNT PLEASANT DR	493	9	LOC	Y			
Ana-1730-010	MONTCLARE AVE	0	324	MOUNT PLEASANT DR	47 AVE	324	8.9	LOC	Y	MF50	2025	$94,153
Ana-1740-010	MONTJOY AVE	0	303	61 ST	47 AVE	303	9	LOC	Y			
Ana-1750-010	MONTROSE AVE	0	88	MONTCALM AVE	MONTROSE AVE_1	88	8.6	LOC	Y			
Ana-1750-020	MONTROSE AVE	88	140	MONTROSE AVE_1	MONTROSE AVE_1	52	10.2	LOC	Y			
Ana-1760-010	MONTROSE AVE_1	0	135	MONTROSE AVE	MONTROSE AVE	135	10.1	LOC	Y			
Ana-1760-020	MONTROSE AVE_1	135	225	MONTROSE AVE	MOUNT PLEASANT DR	90	9.2	LOC	Y	FDM	2035	$45,540
Ana-1770-010	MOUNT PLEASANT DR	0	312	East End	58 ST	312	13.3	COL	Y			
Ana-1770-020	MOUNT PLEASANT DR	312	586	58 ST	39 AVE	274	12.4	COL	Y	MF50	2020	$126,589
Ana-1770-030	MOUNT PLEASANT DR	586	686	39 AVE	MARLER DR	100	12.1	COL	Y	MF50	2020	$39,843
Ana-1770-040	MOUNT PLEASANT DR	686	914	MARLER DR	42 AVE	228	10.9	COL	Y	MF50	2038	$112,047
Ana-1770-050	MOUNT PLEASANT DR	914	1108	42 AVE	43 AVE	194	10.8	COL	Y			
Ana-1770-060	MOUNT PLEASANT DR	1108	1205	43 AVE	44 AVE	97	10.7	COL	Y	MF50	2038	$41,054
Ana-1770-070	MOUNT PLEASANT DR	1205	1299	44 AVE	MONTCALM AVE	94	10.7	COL	Y	MF50	2036	$38,881
Ana-1770-080	MOUNT PLEASANT DR	1299	1497	MONTCALM AVE	MONTROSE AVE_1	198	10.8	COL	Y	MF50	2035	$79,955
Ana-1770-090	MOUNT PLEASANT DR	1497	1548	MONTROSE AVE_1	45 AVE	51	10.5	COL	Y	MF50	2023	$16,764
Ana-1770-100	MOUNT PLEASANT DR	1548	1804	45 AVE	MONTCLARE AVE	256	10.85664	COL	Y	MF50	2035	$85,884
Ana-1770-110	MOUNT PLEASANT DR	1804	1951	MONTCLARE AVE	47 AVE	147	10.9	COL	Y	MF50	2035	$61,059
Ana-1770-120	MOUNT PLEASANT DR	1951	2048	47 AVE	47A AVE	97	10.62062	COL	Y	MF50	2024	$33,388
Ana-1770-130	MOUNT PLEASANT DR	2048	2158	47A AVE	48 AVE WB	110	13.52647	COL	Y	MF50	2035	$57,228
Ana-1780-010	N 48 AVE SERVICE RD	0	247	West End	64 ST	247	9	LOC	Y	MF50	2020	$75,064
Ana-1780-020	N 48 AVE SERVICE RD	247	447	64 ST	East End	200	8.7	LOC	Y	MF50	2020	$61,797
Ana-1780-030	N 48 AVE SERVICE RD	448	921	39 ST	HIGHWAY 26	473	10.2	LOC	Y	RECON	2026	$265,353
Ana-1790-010	PARKRIDGE DR	0	149	600 PARKRIDGE CL / PARKRIDGE DR_1	500 PARKRIDGE CL	149	10.9	LOC	Y			
Ana-1790-020	PARKRIDGE DR	149	331	500 PARKRIDGE CL	400 PARKRIDGE CL	182	10.6	LOC	Y			
Ana-1790-030	PARKRIDGE DR	331	434	400 PARKRIDGE CL	300 PARKRIDGE CL	103	11.1	LOC	Y			
Ana-1790-040	PARKRIDGE DR	434	528	300 PARKRIDGE CL	200 PARKRIDGE CL / PARKRIDGE DR_1	94	11	LOC	Y			
Ana-1790-050	PARKRIDGE DR	528	782	200 PARKRIDGE CL / PARKRIDGE DR_1	100 PARKRIDGE CL	254	11.5	COL	Y	MF50	2037	$112,949
Ana-1790-060	PARKRIDGE DR	782	856	100 PARKRIDGE CL	PARKVIEW DR	74	11.5	COL	Y	MF50	2038	$32,844
Ana-1800-010	PARKRIDGE DR_1	0	68	ENEVOLD DR / PARKVIEW DR	600 PARKRIDGE CL / PARKRIDGE DR	68	11	COL	Y	FDM	2027	$48,620
Ana-1800-020	PARKRIDGE DR_1	68	206	600 PARKRIDGE CL / PARKRIDGE DR	200 PARKRIDGE CL / PARKRIDGE DR	138	10.6	COL	Y	MF50	2025	$48,823
Ana-1810-010	PARKVIEW DR	1	263	CAMROSE DR / NO NAME	PARKRIDGE DR_1	262	9.4	ART	Y	MF50	2032	$98,036
Ana-1810-020	PARKVIEW DR	264	566	ENEVOLD DR / PARKRIDGE DR_1	PARKRIDGE DR	302	15.3	ART	Y	MF50	2034	$186,546
Ana-1810-030	PARKVIEW DR	566	1031	PARKRIDGE DR	39 AVE	465	15.9	ART	Y	MF50	2032	$287,338
Ana-1810-040	PARKVIEW DR	1031	1193	39 AVE	MARLER DR	162	16.3	ART	Y	MF50	2026	$109,218
Ana-1810-050	PARKVIEW DR	1193	1280	MARLER DR	55 ST	87	16.9	ART	Y	MF50	2033	$57,109
Ana-1810-060	PARKVIEW DR	1280	1318	55 ST	53 ST	38	11.5	ART	Y	MF50	2031	$15,031

ElementID	RoadName	From	To	StreetFrom	StreetTo	Length (m)	Width (m)	Class	Curb Exist	Treatment	Treatment Year	Treatment Cost
Ana-1820-010	PARKVIEW DR SB	0	264	CAMROSE DR / VALLEYVIEW DR SB / NO NAME	ENEVOLD DR	264	9	ART	Y	MF50	2030	$93,597
Ana-1830-010	R SERVICE RD GRAND PARK CRES 48A	1	217	48 AVE WB	GRAND PARK CRES	216	8.9	LOC	Y	MF50	2019	$0
Ana-1840-010	S 48TH AVE SERVICE RD	0	449	65 ST	COMP RD	449	9.2	LOC	Y	RECON	2028	$227,194
Ana-1840-020	S 48TH AVE SERVICE RD	450	724	48 AVE	48 AVE	274	8.9	LOC	Y	MF50	2019	$0
Ana-1840-030	S 48TH AVE SERVICE RD	725	1020	48 AVE	48 AVE	295	8.5	LOC	Y	RECON	2027	$137,913
Ana-1840-040	S 48TH AVE SERVICE RD	1021	1326	39 ST	38 ST	305	9.3	LOC	Y	RECON	2031	$156,008
Ana-1840-050	S 48TH AVE SERVICE RD	1326	1455	38 ST	Southeast End	129	9.4	LOC	Y	RECON	2032	$66,693
Ana-1840-060	S 48TH AVE SERVICE RD	1456	1783	48 AVE	37 ST	327	10.13394	LOC	Y			
Ana-1840-070	S 48TH AVE SERVICE RD	1783	1999	37 ST	36 ST / NO NAME	216	10.4	LOC	Y			
Ana-1850-010	SOUTH CAMPUS RD	1	236	50 ST	NO NAME	235	7.5	LOC	Y	RECON	2033	$96,938
Ana-1860-010	VALLEYVIEW DR	0	150	62 ST	59 ST	150	8.2	COL	Y			
Ana-1860-020	VALLEYVIEW DR	150	531	59 ST	25 AVE	381	7.7	COL	Y			
Ana-1860-030	VALLEYVIEW DR	531	724	25 AVE	28 AVE	193	8.179275	COL	Y			
Ana-1860-040	VALLEYVIEW DR	724	861	28 AVE	CAMROSE DR	137	9.6	COL	Y			
Ana-1870-010	VALLEYVIEW DR SB	0	154	62 ST	24 AVE CL_1	154	8.2	COL	Y			
Ana-1870-020	VALLEYVIEW DR SB	154	716	24 AVE CL_1	28 AVE	562	8.278682	COL	Y			
Ana-1870-030	VALLEYVIEW DR SB	716	847	28 AVE	CAMROSE DR / PARKVIEW DR SB	131	8	COL	Y			
Ana-1880-010	WT BUILDING RD	0	333	Northwest End	WT BUILDING RD ACCESS	333	8	LOC	Y	RECON	2028	$146,520
Ana-1890-010	WT BUILDING RD ACCESS	1	103	50 ST	WT BUILDING RD	102	8.6	LOC	Y	RECON	2028	$48,246
Ana-1890-020	WT BUILDING RD ACCESS	103	168	WT BUILDING RD	East End	65	8.7	LOC	Y	RECON	2029	$31,102

APPENDIX D - ISL STORM AND SANITARY CCTV INSPECTIONS AND CONDITION ASSESSMENT



Storm and Sanitary CCTV Inspections and Condition Assessments

City of Camrose

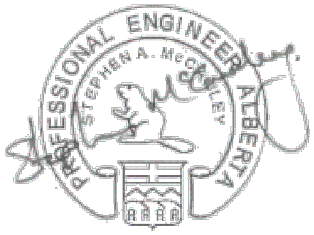
FINAL REPORT

November 2020

ISL Engineering and Land Services Ltd. Is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

Corporate Authorization

This document entitled “Storm and Sanitary CCTV Inspections and Condition Assessments” has been prepared by ISL Engineering and Land Services Ltd. (ISL) for the use of the City of Camrose. The information and data provided herein represent ISL’s professional judgment at the time of preparation. ISL denies any liability whatsoever to any other parties who may obtain this report and use it, or any of its contents, without prior written consent from ISL.



2020-11-06

Stephen McCauley, P.Eng.
Senior Water Resources Engineer

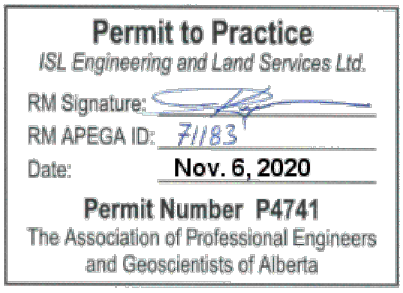


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1.0 Introduction

1.1 Background

The City of Camrose (the City) has over 270 km of storm and sanitary pipe assets, ranging in size from 200 mm to 2,100 mm for storm, and between 100 mm and 1,500 mm for sanitary. These assets are of a variety of ages, with some greater than 100 years old and the City does not have accurate information on their condition.

To guide the future direction of capacity improvement for the two networks, the City uses its Storm and Sanitary Master Plans. However, neither plan adequately assesses pipe condition and subsequent rehabilitation needs, with estimated costs. This information is essential to an effective Asset Management Program (AMP).

An effective AMP enables a municipality to plan and prioritize maintenance and rehabilitation programs based on the condition of the individual assets. It also facilitates integration with other asset management programs, such as road rehabilitation and streetscapes, helping coordinate and prioritize programs of work.

In June 2016, the City commissioned ISL Engineering and Land Services (ISL) to initiate an AMP as it pertains to a selection of the City's storm and sanitary sewer network, by inspecting and completing condition assessments as well as determining rehabilitation needs, cost estimates and prioritization.

For this project, the City pre-selected sewers for inspection based on the following criteria:

- Coinciding with locations where road work is planned in the next 3-5 years;
- The oldest infrastructure; and
- Sewers in locations that are known to be problematic.

1.2 Scope of Work

The scope of work for this project included:

1. **Standards Overview:**
   a. Confirm CCTV inspection standards
   b. Confirm standards for condition assessment and rehabilitation planning
2. **GIS Portal**
   a. Background information and strategy
   b. Develop a non-proprietary GIS data model for managing the data and integration with the City's existing GIS technology
3. **Inspections and Condition Assessments:**
   a. Conduct CCTV pipe inspections
   b. Refine and populate data into the GIS data model

4. **Rehabilitation Planning:**
    a. Evaluate and determine structural and operational grading classifications for the inspected sewers
    b. Determine rehabilitation needs, both maintenance and structural, based on the observed defects and estimate rehabilitation costs
    c. Prioritize the rehabilitation needs
    d. Populate data into GIS integration model
    e. Prepare a summary report of the findings

2.0 Standards

2.1 CCTV Inspections

CCTV inspections were completed by IVIS Inc. The inspections were completed in accordance with the Pipeline Assessment and Certification Program (PACP). PACP is an international standard for the assessment of pipelines, manholes, and laterals (service connections).

2.2 Condition Assessments for Sewers

Assessment of the structural and operational conditions of the inspected infrastructure followed the National Association of Sewer Service Companies (NASSCO) protocols. The NASSCO protocols use the Water Research Centre (WRc) defect assessment and classification model. This is a research-based model that determines the condition of a pipe based on structural and operational defects. The condition assessment gradings are categorized in Tables 2.1 to 2.3.

Table 2.1: Structural Condition Grades

Structural Condition Grade	Implication
5	Failed or failure imminent
4	Very poor condition/High structural risk.
3	Poor condition/Moderate structural risk
2	Fair condition/Minimal Structural risk
1	Acceptable condition

Table 2.2: Operation Condition Grades

Operational Condition Grade	Issue
5	Severe roots/debris/grease/intruding lateral (less than 75% CSA)
4	Heavy roots (mass)/encrustation/debris/sags /grease/intruding lateral (50-75% loss of CSA)
3	Medium roots/encrustation/debris/sags/ grease/intruding lateral (20-50% loss of CSA)
2	Light roots/encrustation/debris/grease/intruding lateral (5-20% loss of CSA)
1	Acceptable condition (less than 5% loss of CSA)

To assist the City in determining timelines for implementing identified rehabilitation or re-inspection works, a prioritization summary was developed based on the condition grade implications.

Table 2.3: Prioritization

Priority	Implication	Condition Grade
1	Repair or service immediately	5 and sometimes 4
2	Repair or service within the next 5 years	3 and 4
3	Re-inspect in 5 to 10 years	1 and 2

3.0 GIS Portal

3.1 GIS Background

There are custom GIS programs that provide a specialized GIS interface with PACP data. However, these platforms have considerable costs associated with them for initial software purchase and licensing and tend to be only cost effective for large municipalities with in-house hydraulic modeling capabilities.

The City of Camrose uses a GIS database for most of its infrastructure, including its storm and sanitary sewer networks. To provide a cost-effective solution, without having to commit to proprietary software and licensing, it was proposed to build on this by developing a GIS portal that would enable the addition of pertinent condition and rehabilitation assessment information into the City's existing GIS.

3.2 Portal Development

The GIS portal was created using Microsoft Access. The advantage of this is that it allows data management between Microsoft Excel and GIS platforms. Survey data can either be managed directly in Access using forms, or in a spreadsheet format. Then the data can be directly opened and viewed in GIS through ArcGIS (10.1 or higher).

For this application, the interface was developed so that each sewer can have multiple records, allowing the City to historically track inspection and rehabilitation work. It also allows the City to update inspection records when rehabilitation work is complete, enabling tracking of rehabilitation estimates versus actual costs, helping the City refine budgets.

The key information recorded in the database for each pipe length included:

- Inspection date and inspection contractor
- Review Engineer and date of the review
- Identified structural and operational condition assessments
- Prioritization or timeline for rehabilitation or re-inspection
- Description of the condition, including type and location of defects
- Description of the proposed rehabilitation
- Estimate of rehabilitation cost

In the development, inconsistencies in the original pipe data, including missing pipe references where manholes had been constructed on an existing line, resulted in GIS and data problems. To resolve these, the pipes were split at the manholes and renumbered with a new pipe index. For reference and look up purposes, the original City GIS ID is included in the Access data entry form. However, when using for inspection and data entry, it is recommended that the new GIS ID is used.

4.0 Inspections and Condition Assessments

4.1 Inspections

The inspections were complete in two stages. Stage 1 was completed in 2016 and Stage 2 in 2018 and included three separate phases of work.

Stage 1: 2016 Inspections

The scope of work for this stage was identified by the City and included inspection of 36 sanitary sewers ranging in size from 200 to 450 mm diameter and 16 storm sewers of sizes 275 to 1350 mm diameter. The length of the pipe runs to be inspected included approximately 3,224 m of sanitary sewer and 1,610 m of storm sewer for a total of 4,834 m.

The inspections were undertaken by IVIS Inc. and included two phases, one for sanitary and one for storm inspections.

PHASE 1: 2016 SANITARY INSPECTIONS

Of the 36 sanitary sewer runs attempted, 19 were unable to be completed in the first pass and 18 reverse runs were attempted. One reverse run could not be attempted as the downstream manhole (MH 9_201.00) could not be located (possibly buried under concrete ramp). The most common reasons for in-complete runs included heavy encrustation deposits and protruding lateral connections that prevented the inspection camera from passing. Of the 3,224 m of sanitary sewer identified for inspection, the total length of inspections completed amounted to 1,913 m or 59%.

Maps showing the sewer locations and records of the condition and rehabilitation assessments are included in **Appendix A**.

PHASE 2: 2016 STORM INSPECTIONS

All but one of the 16 storm sewer inspections were completed on the first pass. A reverse run was not attempted as the manhole (MH 3044) was inaccessible (located in a travel trailer storage yard). The reason for the incomplete run was due to a protruding CB lead that prevented the inspection camera from passing. Of the 1,610 m of storm sewer identified for inspection, the total length of inspections completed amounted to 1,559 m or 97%.

Maps showing the sewer locations and records of the condition and rehabilitation assessments are included in **Appendix B.**

2018 Inspections

The scope of work for this stage was also identified by the City and included inspection of 58 sanitary sewers of 200 mm diameter, amounting to a total length of some 4,720 m.

The inspections were undertaken by IVIS Inc. and included on sanitary inspection phase.

PHASE 3: 2018 SANITARY INSPECTIONS

Of the 58 sanitary sewer runs attempted, 12 were unable to be completed in the first pass and 11 reverse runs were attempted. One was not attempted on line 3-127.00. GIS shows the manhole

(MH 3_120.06) located in the intersection of 48 Avenue and 46 Street. Site reconnaissance suggests the line dead ends before this. Reasons requiring reverse runs included encrustations, lateral protrusions and two collapses were discovered. The total amount of inspection completed was 4,311 m or 93%.

Maps showing the sewer locations and records of the condition and rehabilitation assessments are included in **Appendix C**.

4.2 Condition and Rehabilitation Assessments

The CCTV inspection reports and videos were reviewed to confirm operational and structural issues and defects. From this, and in accordance with the condition grading parameters set out in Section 2, overall operational and structural condition grades were determined for each pipe. Rehabilitation priorities were assigned based on both operational and structural condition grade.

In addition, rehabilitation needs, and opportunities were also identified, and cost estimates were prepared for any rehabilitation need identified as a priority 1 or 2. Costs for future re-inspections associated with Grade 3 priorities were not assigned.

Detailed documentation of the condition assessment, rehabilitation assessments, and rehabilitation priorities are included in Appendix B - Condition and Rehabilitation Assessments. The tables shown in Appendix B, combined with the documentation from the inspections, provide a comprehensive report for each stage of inspections.

This information was then manually input into the Access database and provided to the City for uploading to GIS. The reason for the manual input was because the spreadsheet was prepared in advance of the Access data entry model. Future inspections and condition assessments could be completed directly into the Access database.

A summary of the number of pipes runs found with conditions grades 3 to 5 is presented in Table 4.1.

Table 4.1: Pipe Runs with Condition Grades 3 to 5

Inspection Phase	Structural Condition Grade			Operational Condition Grade		
	3	4	5	3	4	5
(1) 2016 Sanitary	7	1	7	16	12	5
(2) 2016 Storm	0	0	1	0	0	0
(3) 2018 Sanitary	13	10	12	19	11	4
Totals	**20**	**11**	**20**	**35**	**23**	**9**

4.2.1 Rehabilitation Priorities and Cost Estimates

Rehabilitation requirements were prioritized based on condition grades and rehabilitation need. Grade 5 structural and operational conditions were identified as a priority 1 or immediately requiring rehabilitation. Prioritization of Grade 4 condition assessments was determined based on consideration of the observed defects and the expected remaining life span. Thus, some grade 4 would have a prioritization rating of 1 (immediate repair or service) whereas others may be 2 (repair or service within the next 5 years).

In addition, when determining rehabilitation needs, multiple options were identified where possible. This provided a minimum rehabilitation need to resolve one or multiple specific defects as well as a recommended rehabilitation that would not only address the specific observed defects but also mitigate other issues arising within a particular sewer length in the near future by renewing the entire length.

A summary of the findings is presented in Tables 4.2 to 4.3.

Table 4.2: Priority 1 (Immediate) Rehabilitation Needs

Phase	No. of Affected Pipes	Rehabilitation Cost Estimates	
		(Minimum)	(Recommended)
Phase 1: 2016 Sanitary Inspections	15	$152k	$236k
Phase 2: 2016 Storm Inspections	1	$13k	$13k
Phase 3: 2018 Sanitary Inspections	23	$329k	$949k
Totals		**$494k**	**$1.198M**

Table 4.3: Priority 2 (Repair of Service in Next 5 Years) Rehabilitation Needs

Phase	No. of Affected Pipes	Rehabilitation Cost Estimates	
		(Minimum)	(Recommended)
Phase 1: 2016 Sanitary Inspections	23	$174k	$316k
Phase 2: 2016 Storm Inspections	5	$15k	$15k
Phase 3: 2018 Sanitary Inspections	19	$103k	$383k
Totals		**$292k**	**$714k**

5.0 Conclusion and Recomendations

5.1 Conclusions

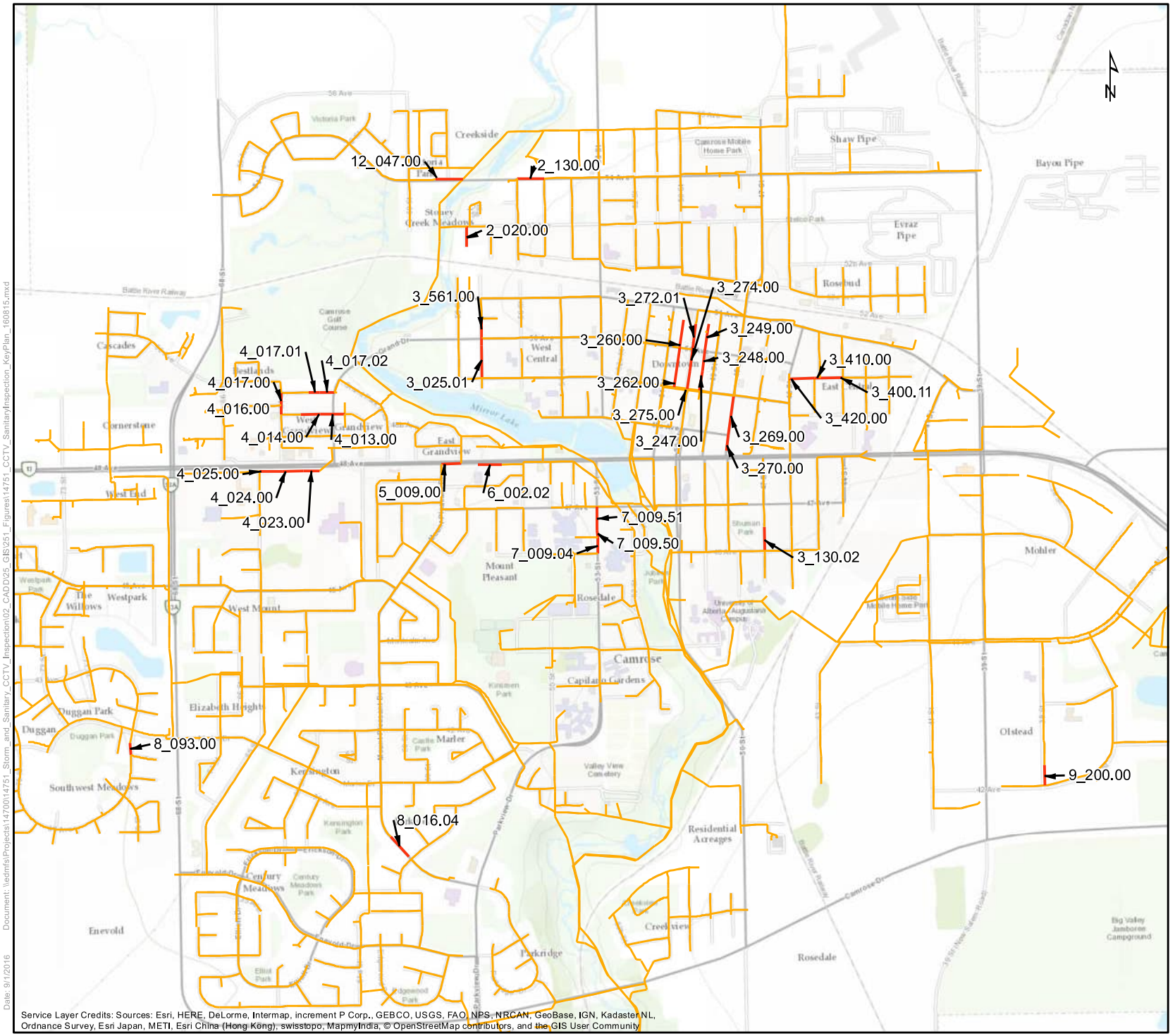
- **2016 Sanitary Sewer Inspections:**
  - 19 of 36 inspection runs were completed in the first pass
  - Abandonment of initial runs was primarily due to protruding service laterals and heavy encrustation deposits
  - The total length of sewer pipe that could be inspected amounted to 1,913 m (59%) of a total length of 3,224 m
  - 5 runs determined with Operational Condition Grades of 5
  - 12 runs determined with Operational Condition Grades of 4
  - 16 runs determined with Operational Condition Grades of 3
  - 7 runs determined with Structural Condition Grades of 5
  - 1 run determined with Structural Condition Grades of 4
  - 7 runs determined with Structural Condition Grades of 3
- **2016 Storm Sewer Inspections:**
  - 15 of 16 runs were completed (1,559 m of 1,610m total length)
  - A protruding service lateral and an inaccessible manhole prevents 100% completion of the 2016 storm sewer inspections
  - 0 runs determined with Operational Condition Grades of 5
  - 0 runs determined with Operational Condition Grades of 4
  - 0 runs determined with Operational Condition Grades of 3
  - 1 run determined with Structural Condition Grades of 5
  - 0 run determined with Structural Condition Grades of 4
  - 0 runs determined with Structural Condition Grades of 3
- **2018 Sanitary Inspections:**
  - 46 of 58 inspections runs were completed in the first pass
  - Abandonment of initial runs was primarily due to protruding service laterals and heavy encrustation deposits. Additionally, two pipes were observed to have collapsed in part
  - The total length of sewer pipe that could be inspected amounted to 4,311 m (93%) of a total length of 4,720 m
  - 4 runs determined with Operational Condition Grades of 5
  - 11 runs determined with Operational Condition Grades of 4
  - 19 runs determined with Operational Condition Grades of 3
  - 12 runs determined with Structural Condition Grades of 5
  - 10 runs determined with Structural Condition Grades of 4
  - 13 runs determined with Structural Condition Grades of 3
- Capital budget needs for Priority 1 servicing and repairs ranges from $494k to $1.198M
- Capital budget needs for Priority 2 servicing and repairs ranges from $292k to $714k.

5.2 Recommendations

- Undertaken preliminary design to individually prioritize all rehabilitation recommendations, including confirming the rehabilitation works to be carried through to detailed design i.e. minimum required versus concept recommendation.
- Complete detailed design and construction of all confirmed priority 1 rehabilitations at the earliest opportunity
- Repair or services as required, all priority 2 recommendations within the next 5 years

APPENDIX A

Phase 1 Sanitary Inspections
– Maps and Condition Assessments


12_047.00
2_130.00
2_020.00
3_561.00
3_272.01
3_274.00
3_249.00
3_260.00
3_248.00
3_410.00
3_400.11
3_420.00
3_262.00
3_275.00
3_247.00
3_269.00
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4_016.00
4_014.00
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4_023.00
5_009.00
6_002.02
7_009.51
7_009.50
7_009.04
8_093.00
8_016.04
9_200.00
Creekside
Shaw Pipe
Bayou Pipe
Evraz Pipe
Rosebud
Cascades
Cornerstone
Westlands
West Central
Downtown
East Grandview
Mirror Lake
West End
Mount Pleasant
Rosedale
Camrose
Capilano Gardens
Mohler
Olstead
Westpark
The Willows
West Mount
Duggan Park
Duggan
Elizabeth Heights
Southwest Meadows
Kensington
Century Meadows
Enevold
Parkridge
Creekview
Residential Acreages
Big Valley Jamboree Campground
Stoney Creek Meadows
Victoria Park
Camrose Golf Course
Camrose Mobile Home Park
Battle River Railway
Legend
Sanitary Pipes
To be Inspected
Not to be Inspected
1:23000
0 95 190 380 570 760
Meters
KEY PLAN
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION
CITY OF Camrose
IVIS Inc.
ISL Engineering and Land Services
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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- Sanitary Pipe: To be inspected

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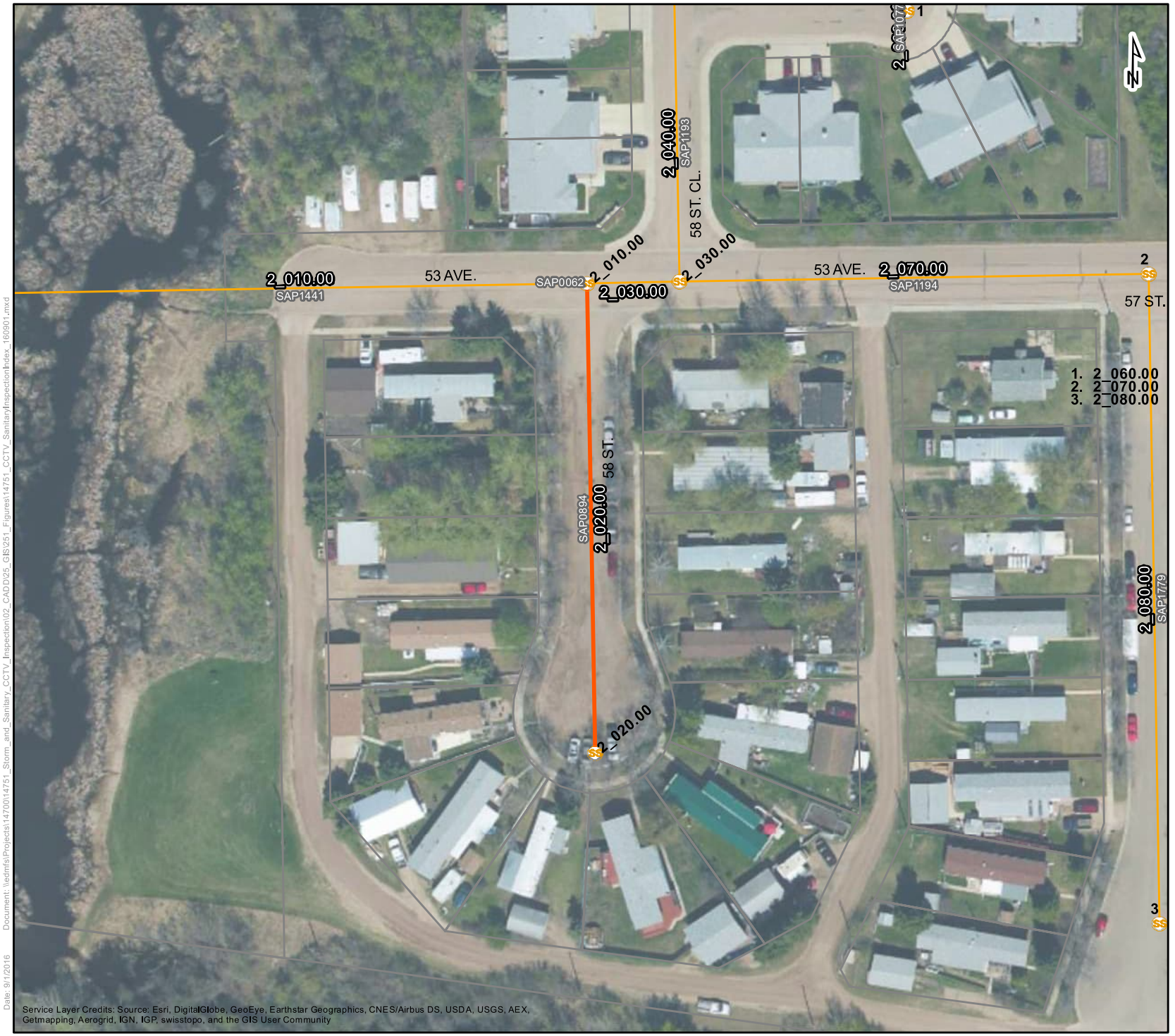
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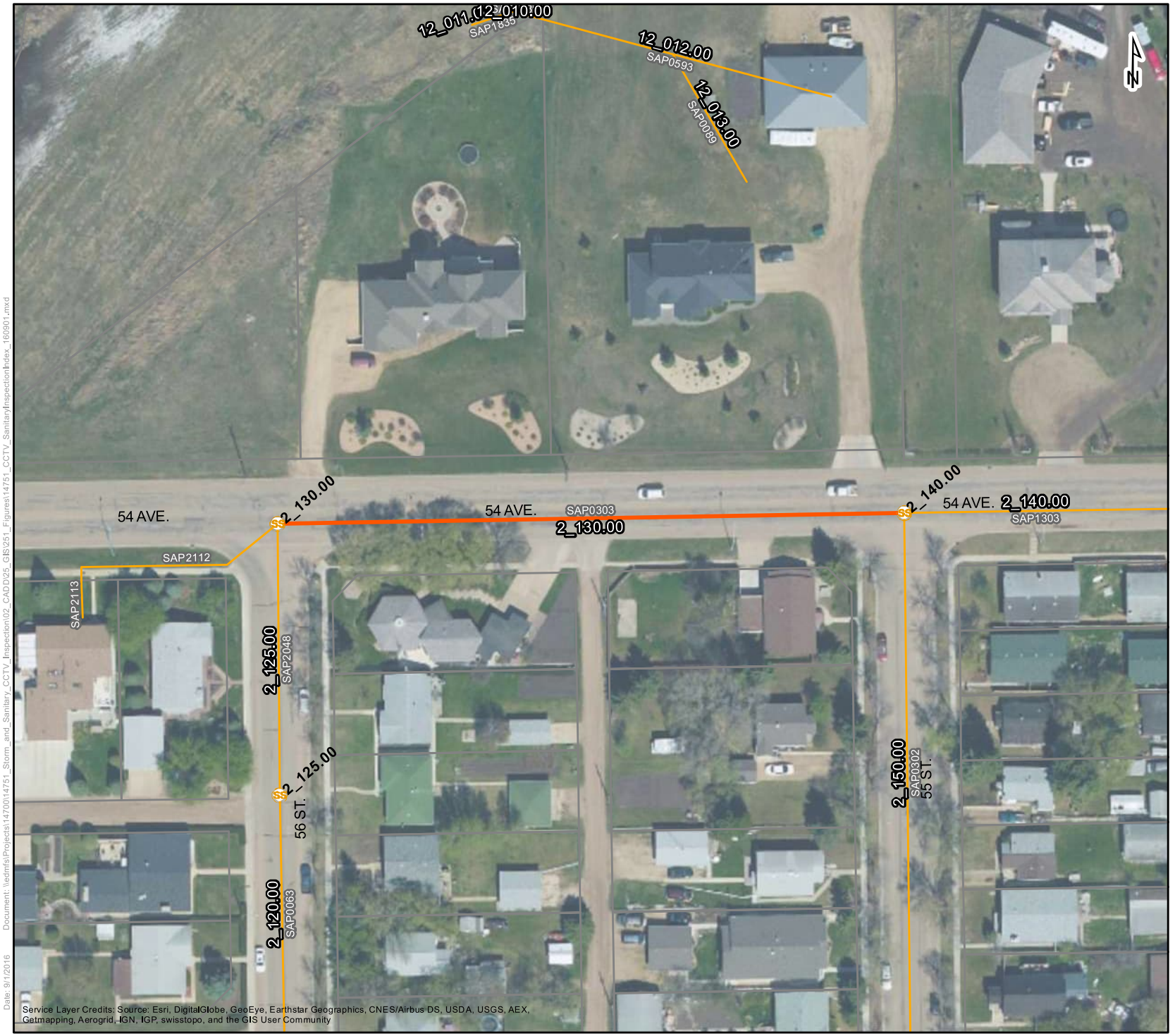
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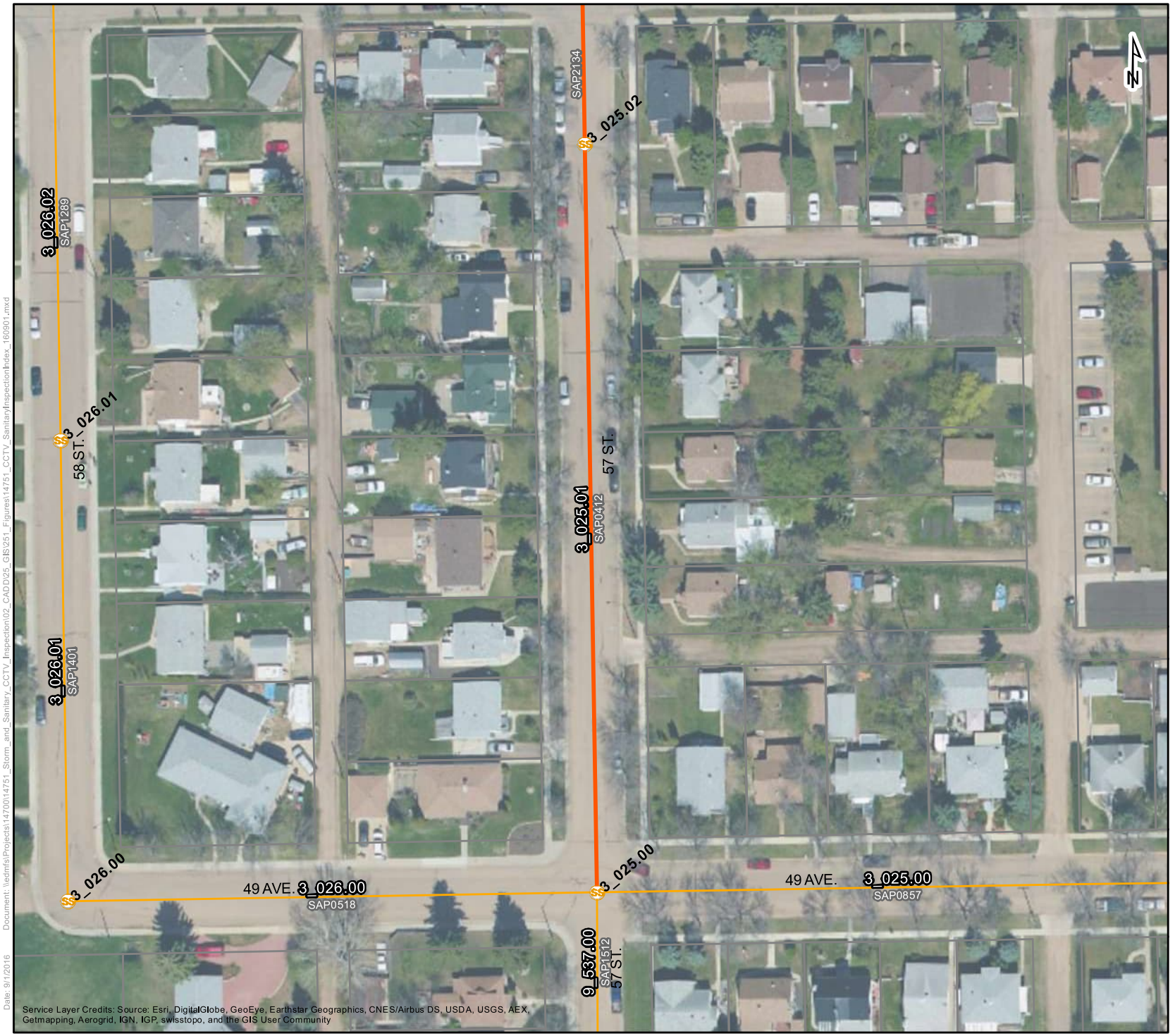
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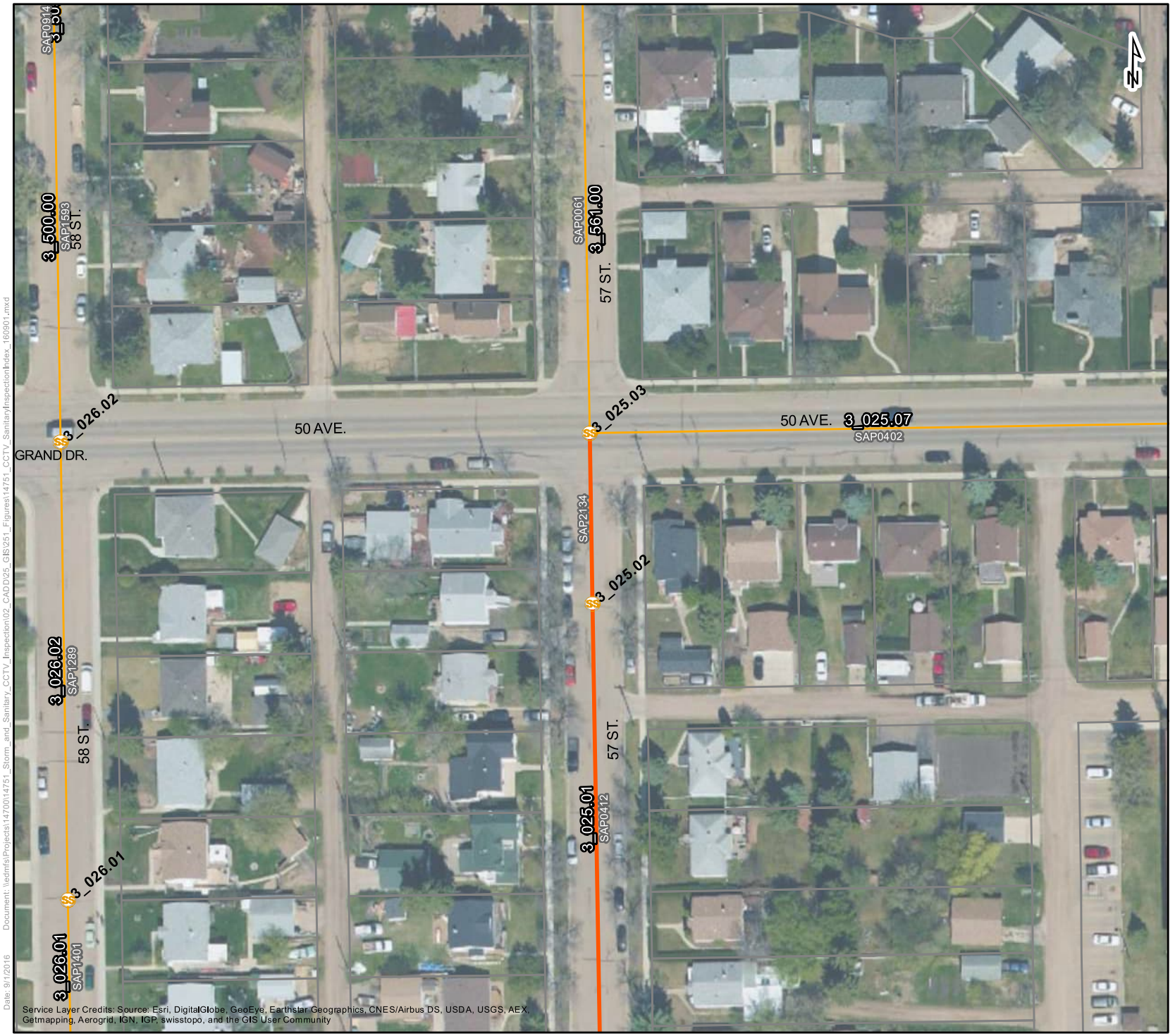
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STORM AND SANITARY
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SANITARY PIPE INDEX
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Legend

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- Sanitary Pipe: To be inspected

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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

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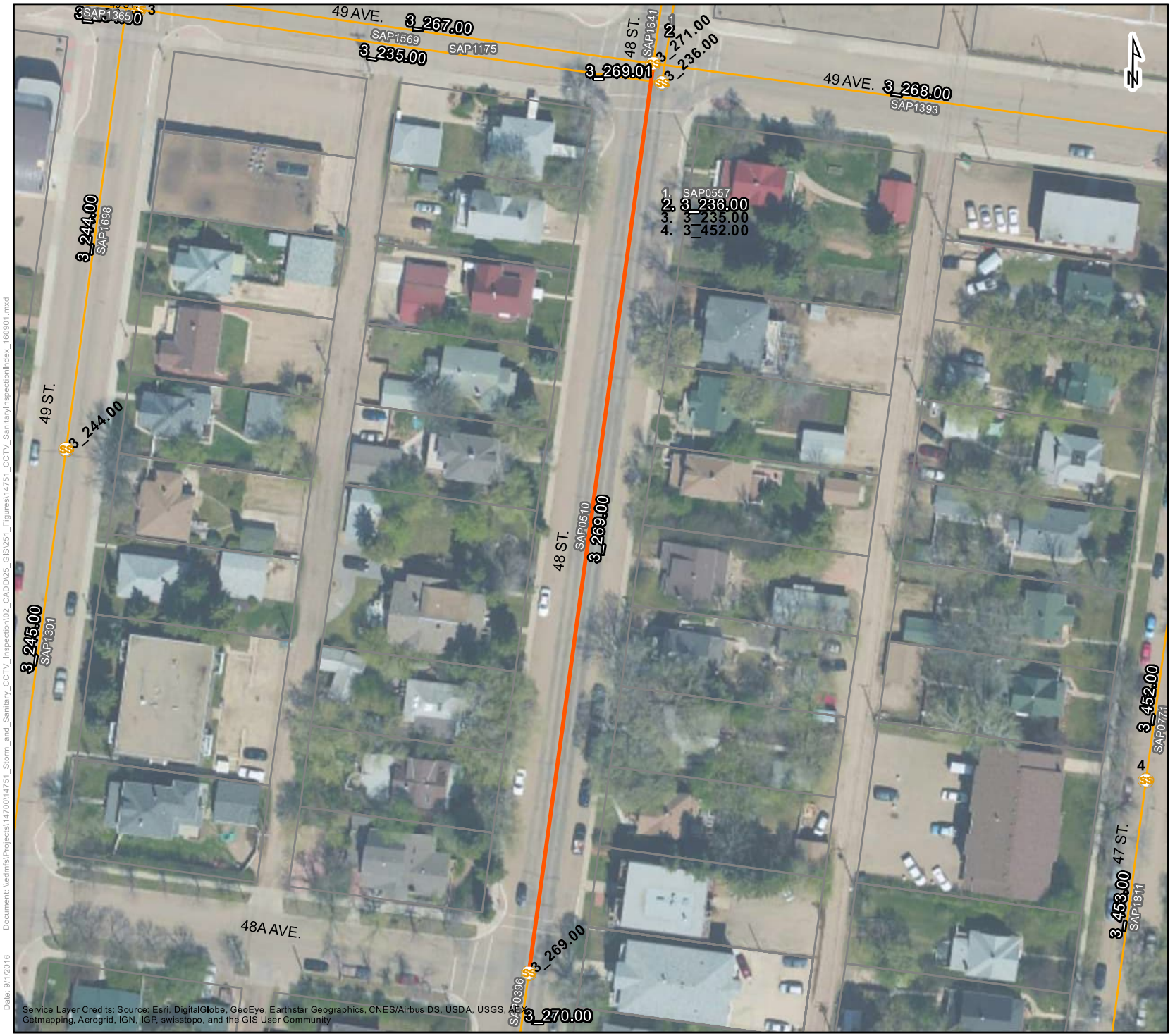
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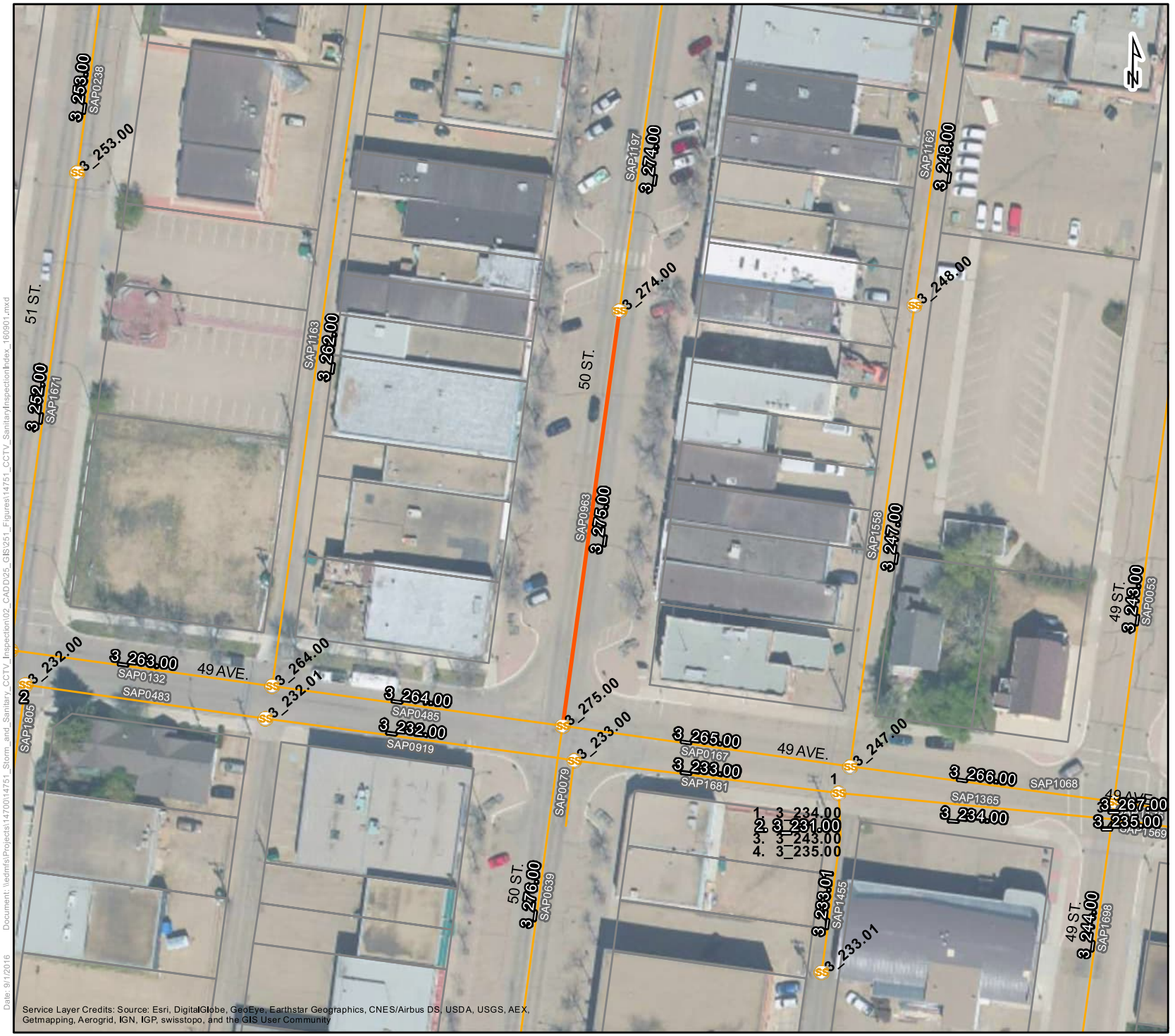
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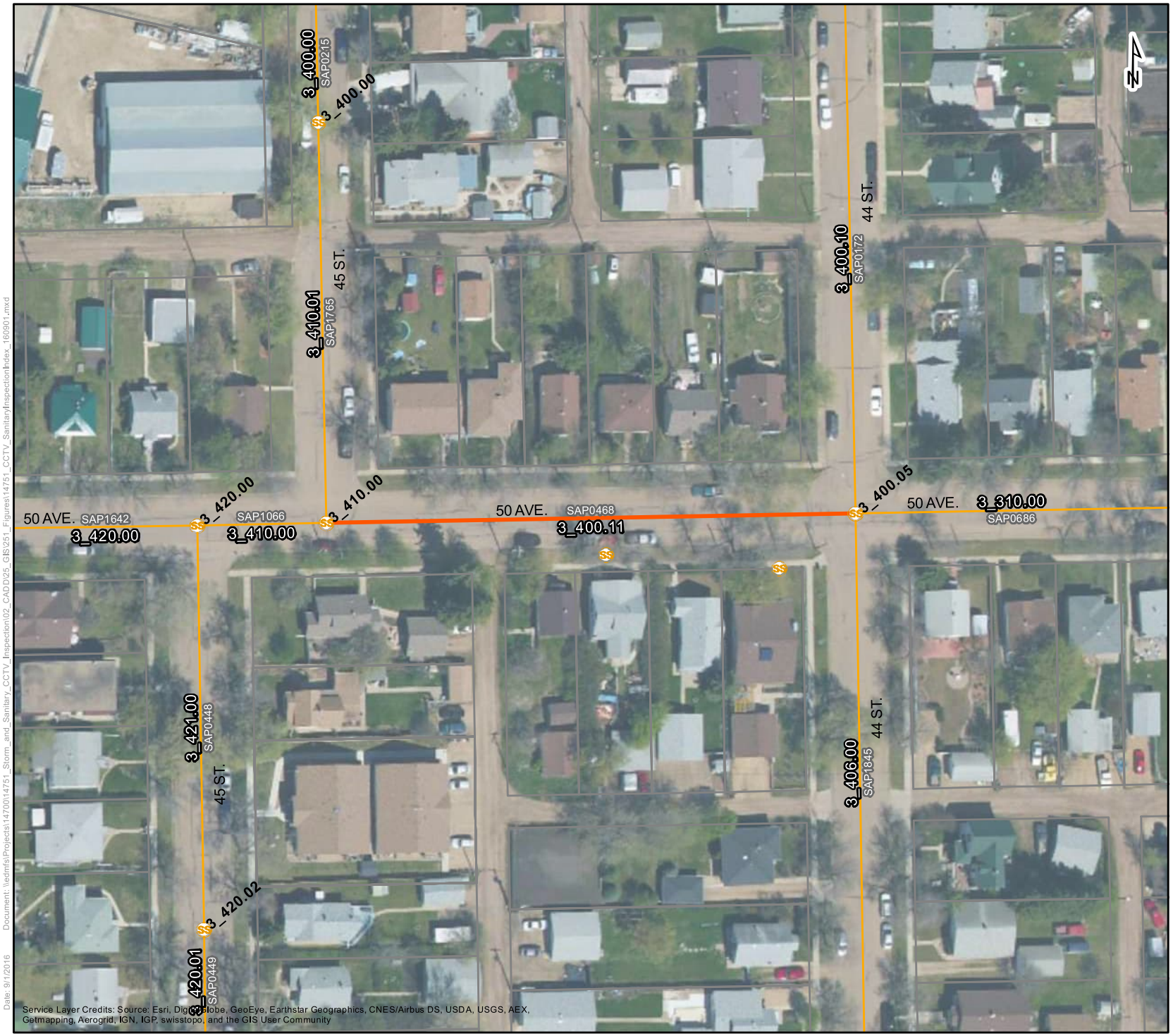
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Legend

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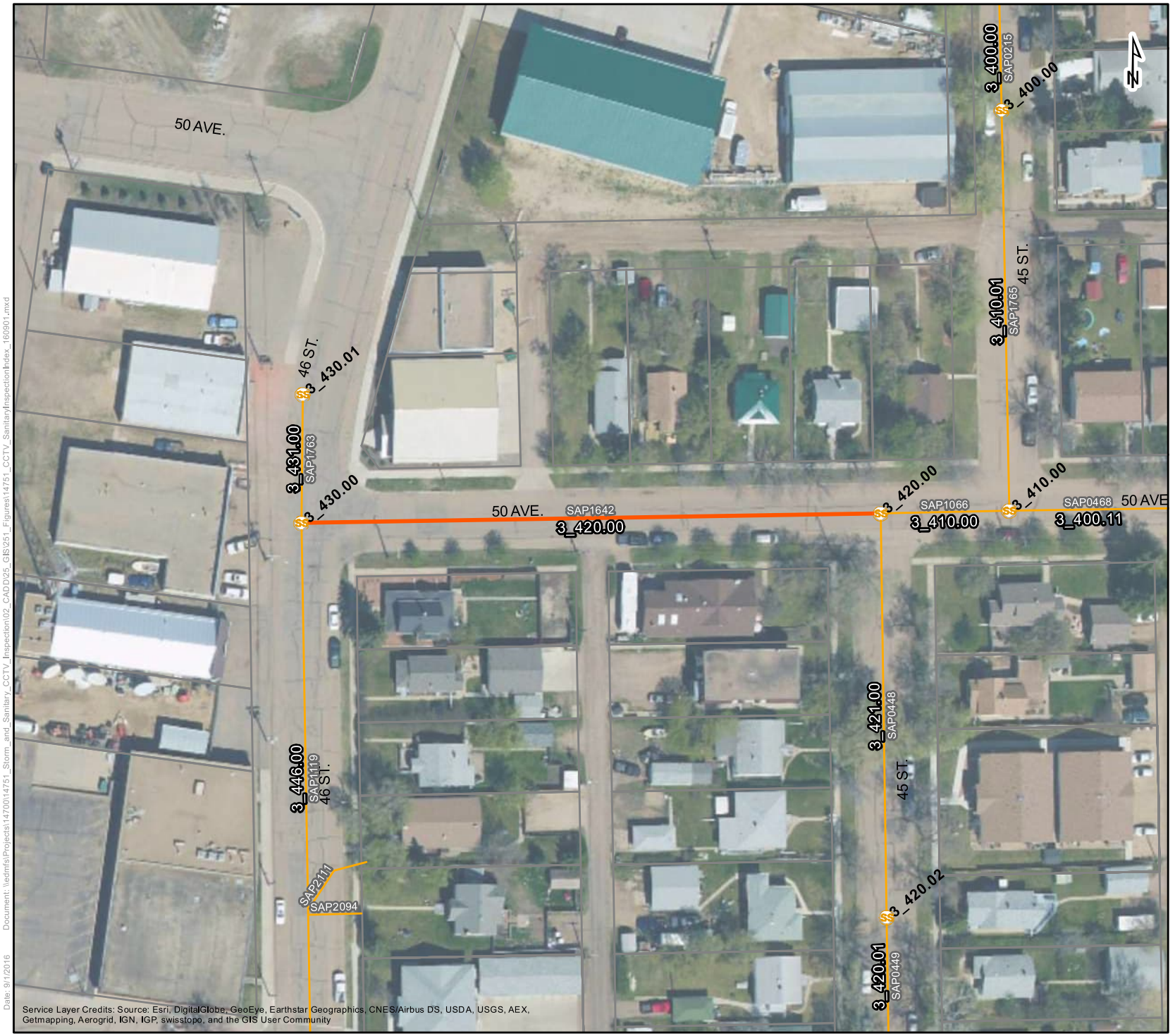
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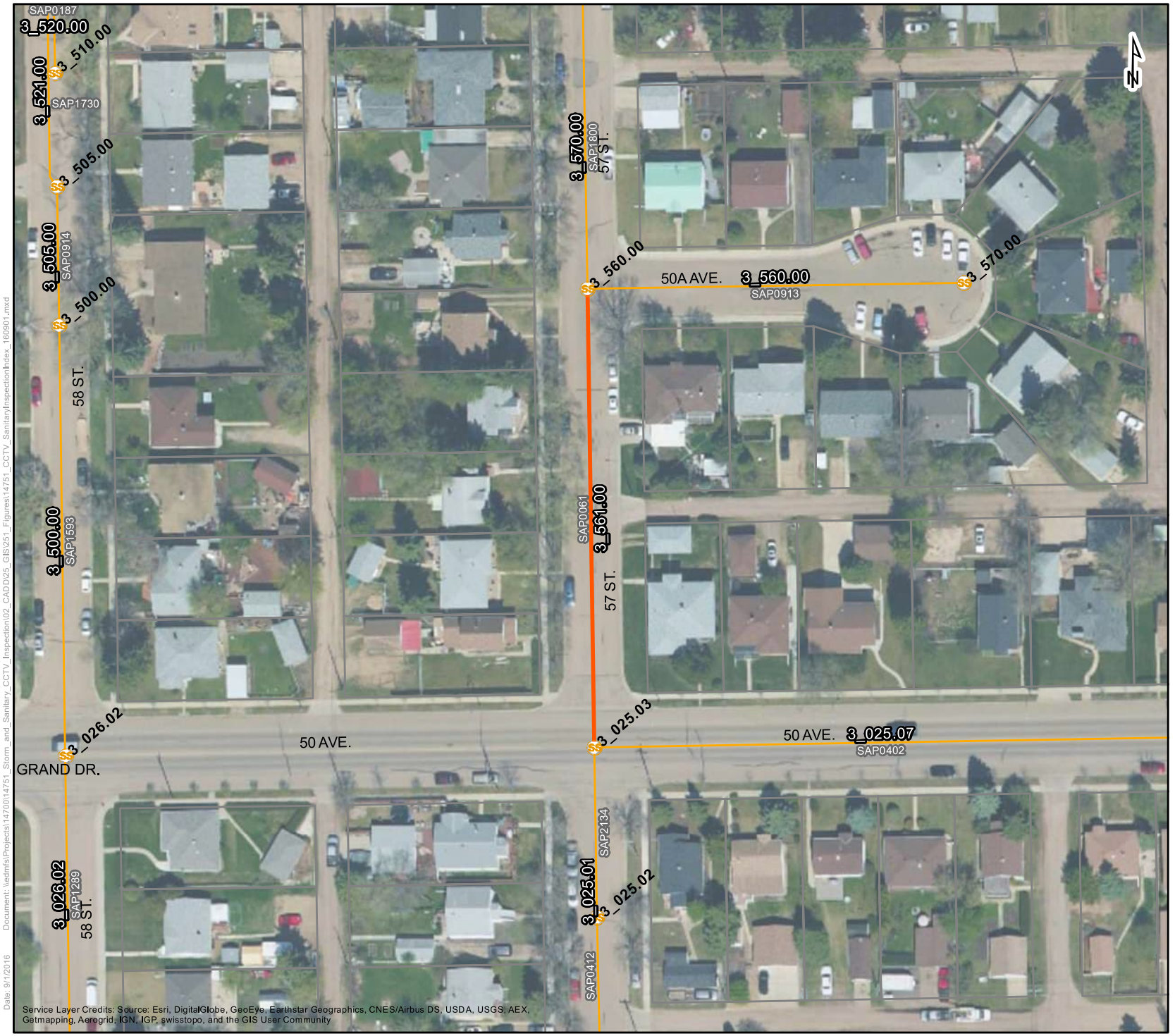
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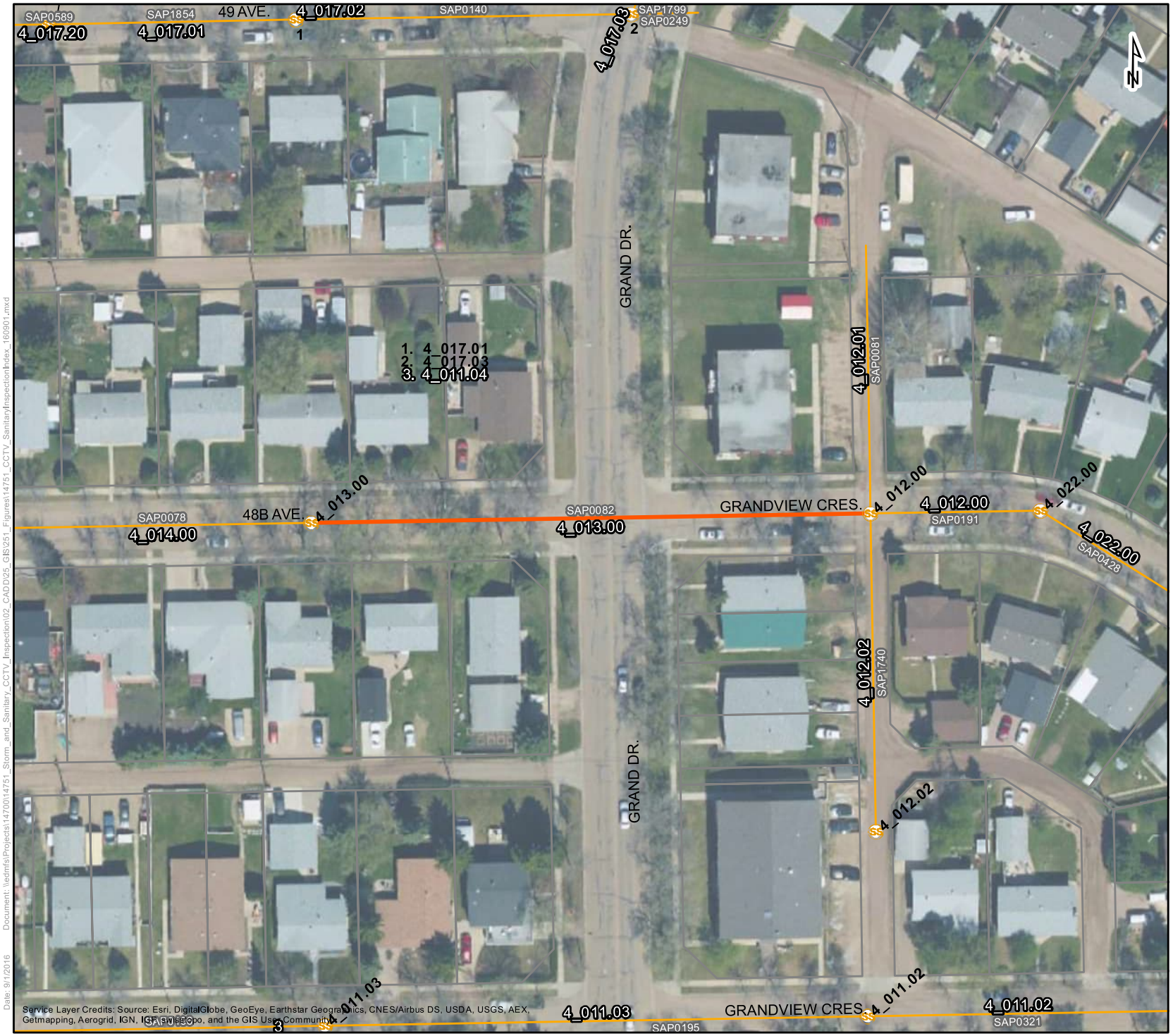
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Legend

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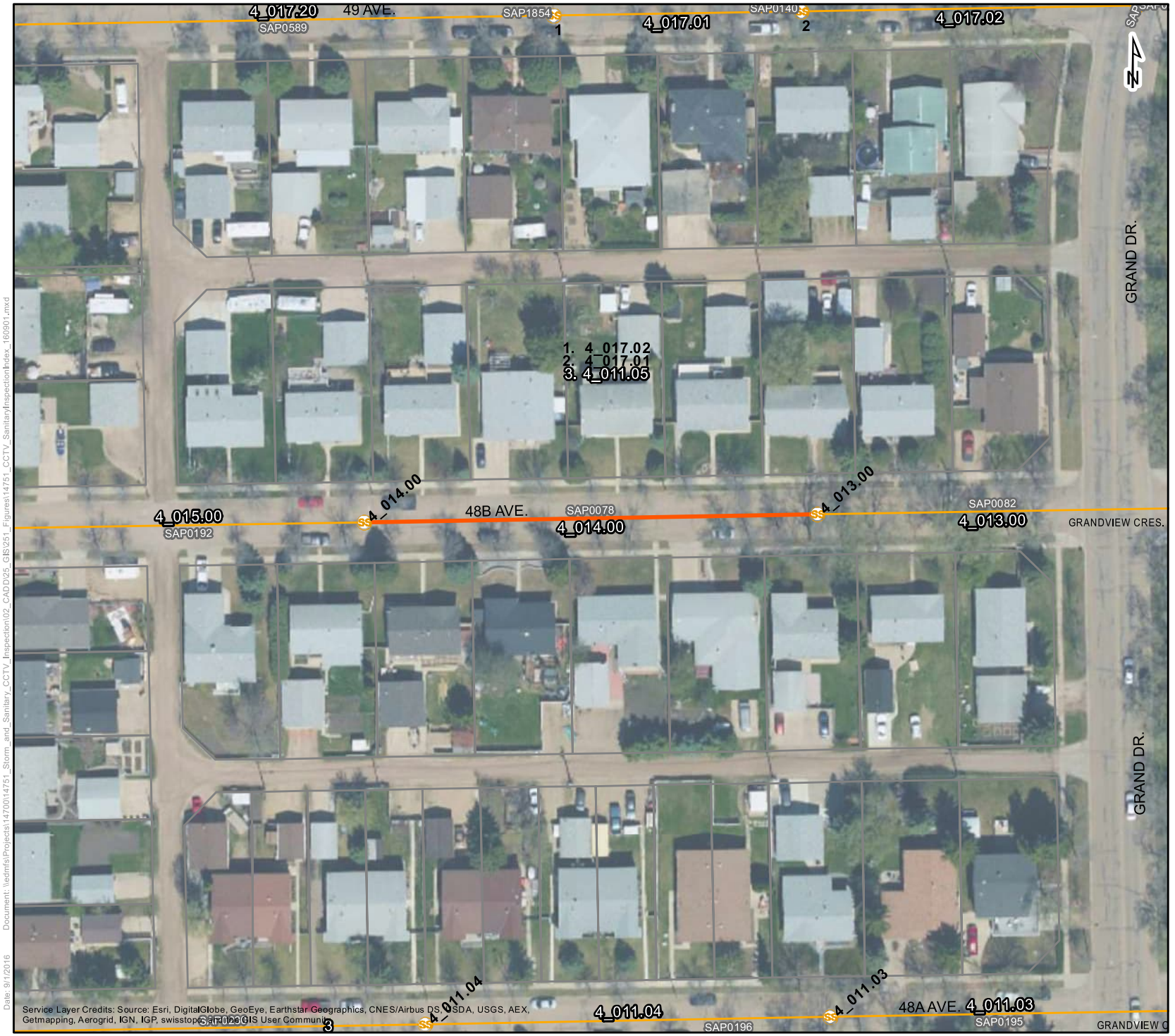
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Legend

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- Sanitary Pipe
- Sanitary Pipe: To be inspected

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SANITARY PIPE INDEX
STORM AND SANITARY
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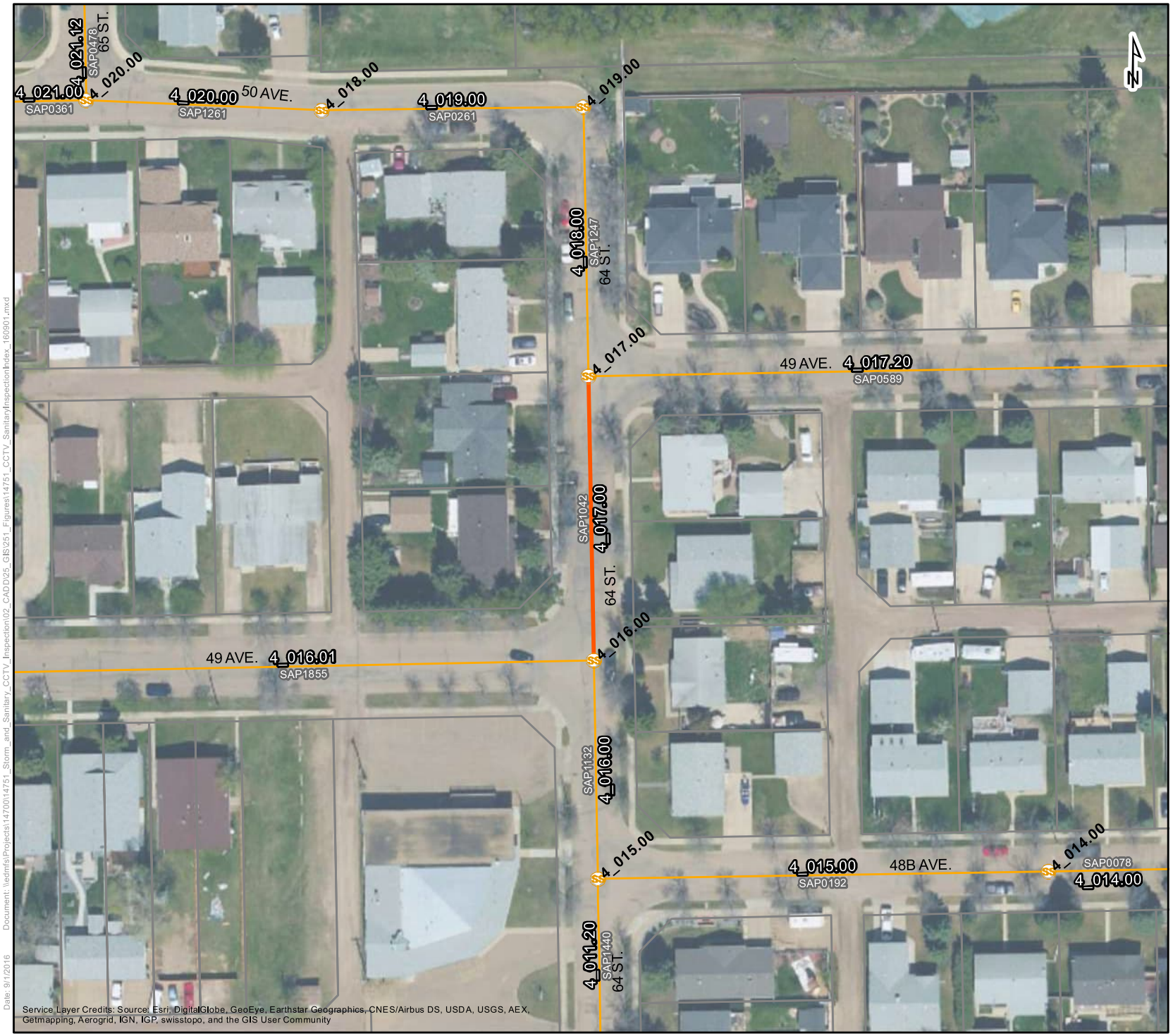
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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 4_017.00
SANITARY PIPE INDEX
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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 4_017.01
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Legend

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- Sanitary Pipe: To be inspected

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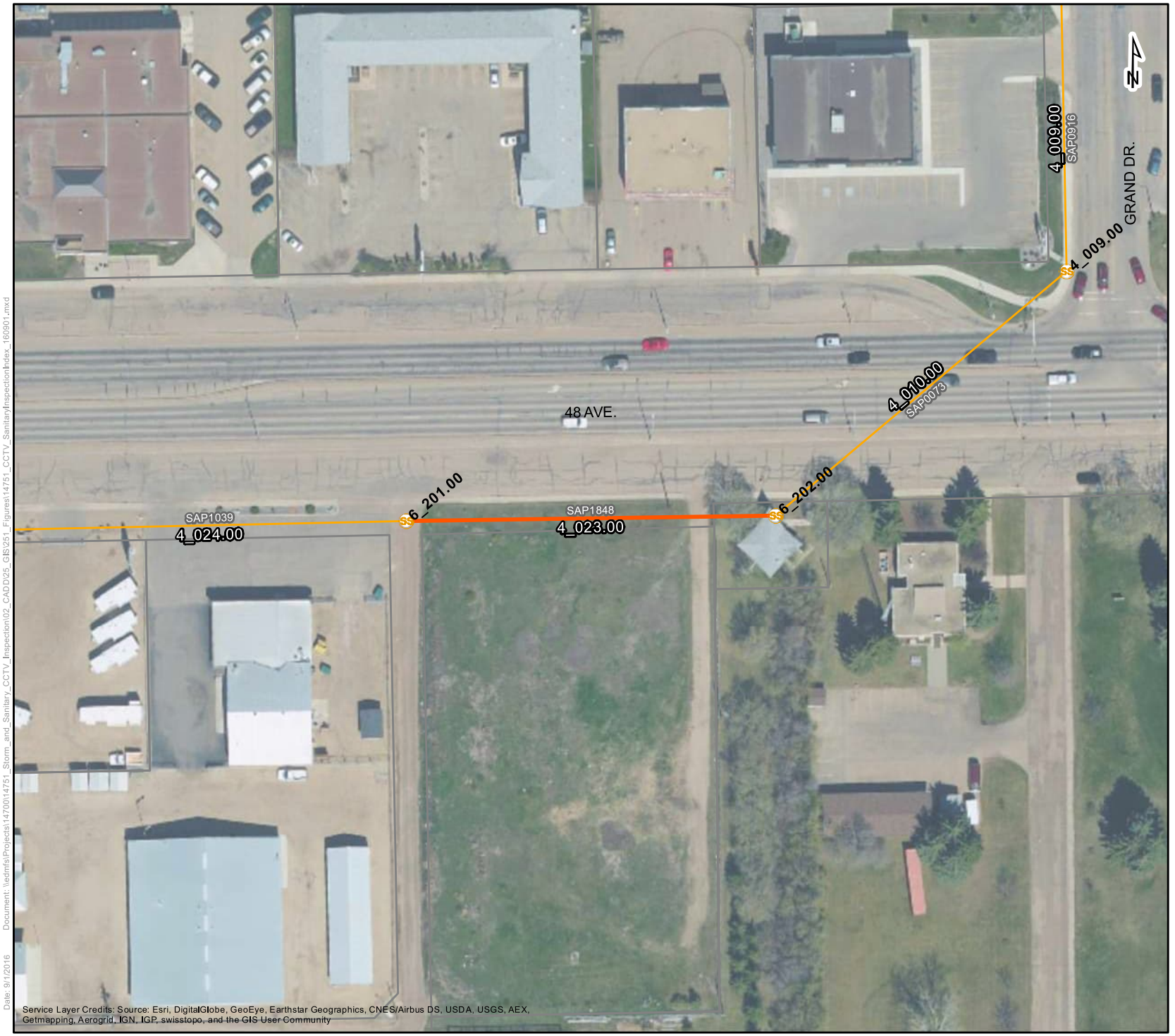
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Legend

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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

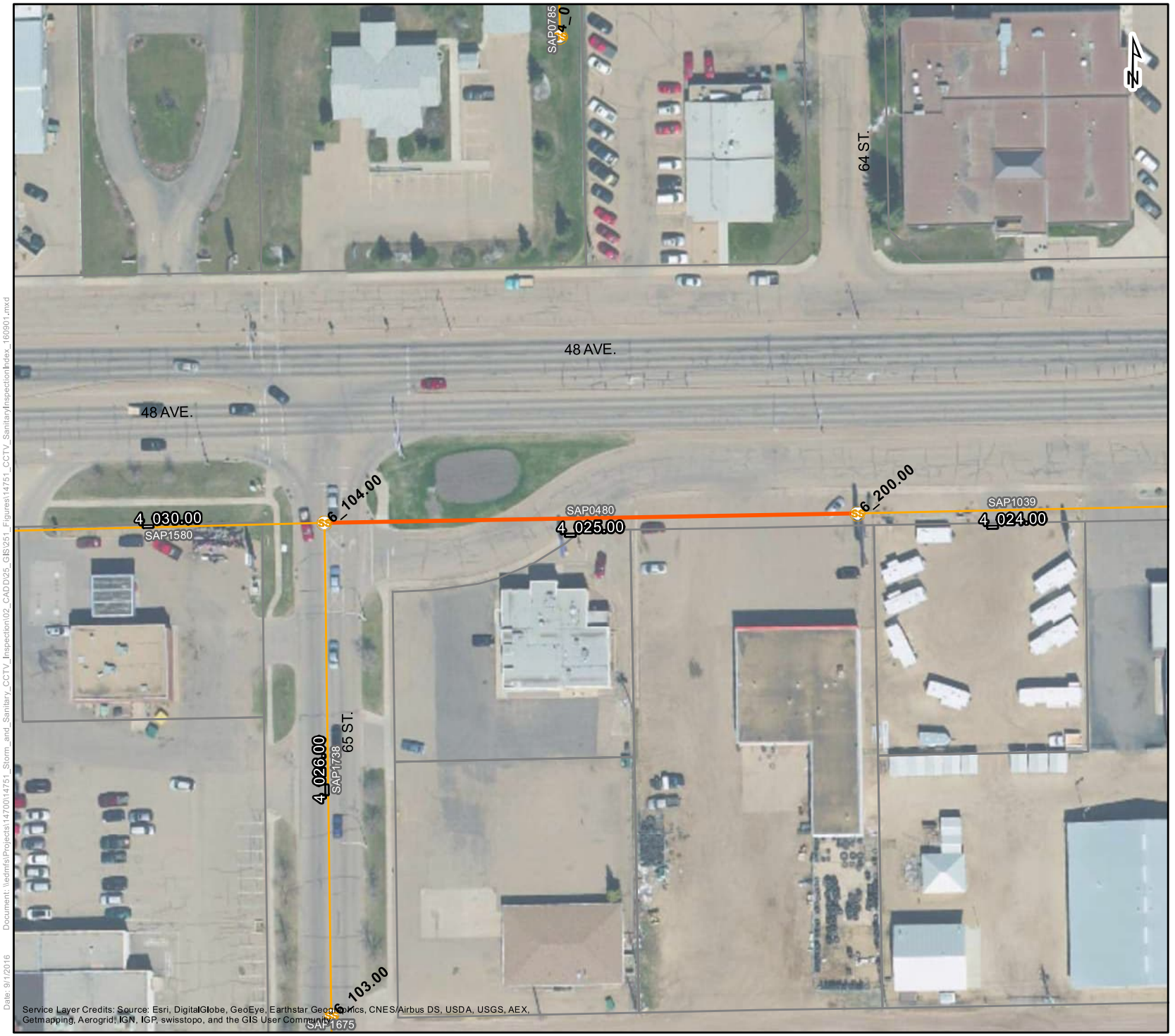
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SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

Date: 9/1/2016 Document: \\edmfs\Projects\147001\14751_Storm_and_Sanitary_CCTV_Inspection\02_CADD\25_GIS\251_Figures\14751_CCTV_SanitaryInspectionIndex_160901.mxd



Legend

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PIPE ID: 4_025.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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Legend

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- Sanitary Pipe: To be inspected

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PIPE ID: 5_009.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

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STORM AND SANITARY
CCTV INSPECTION

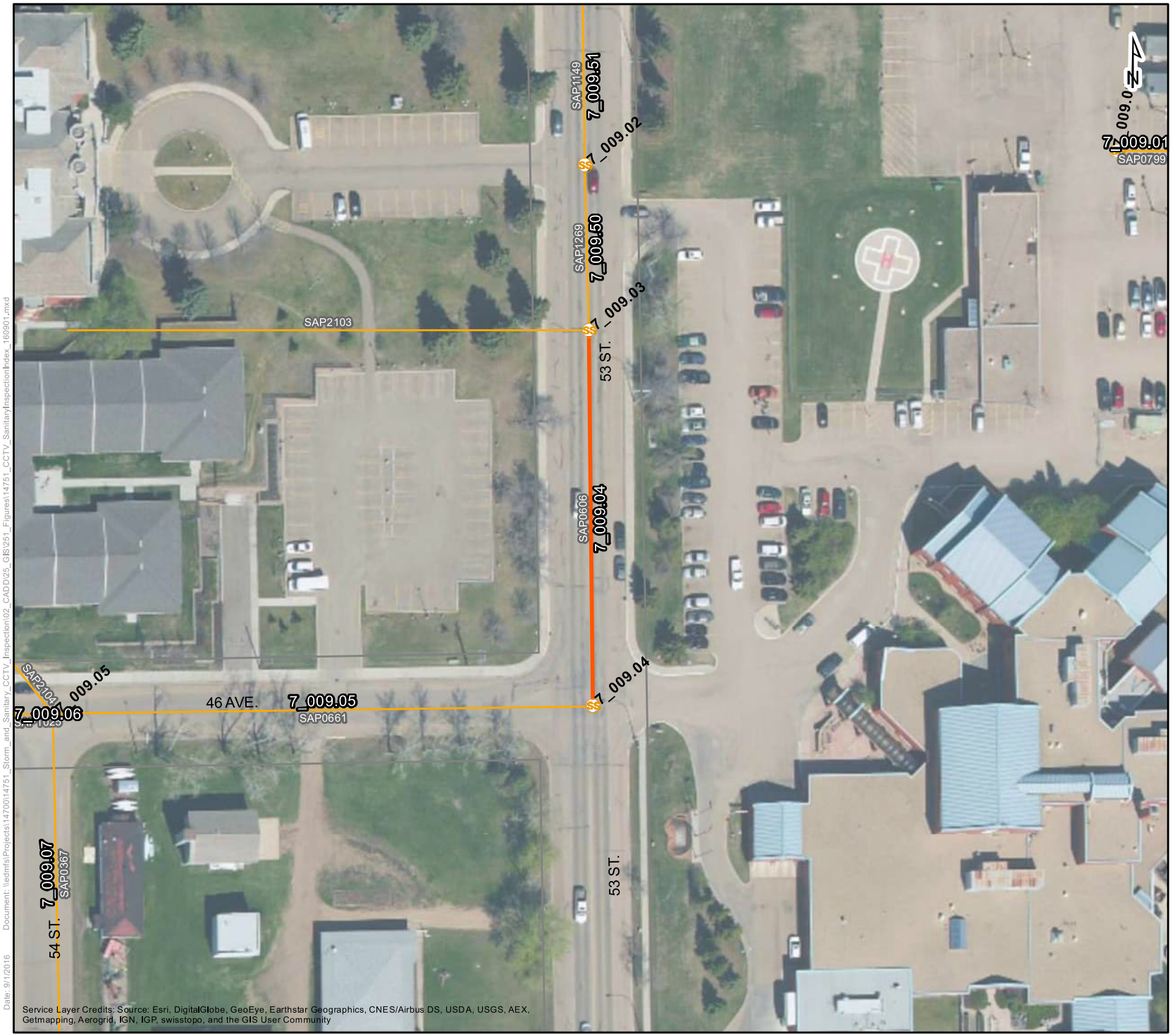
CITY OF Camrose

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Legend

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- Sanitary Pipe: To be inspected

1:1000

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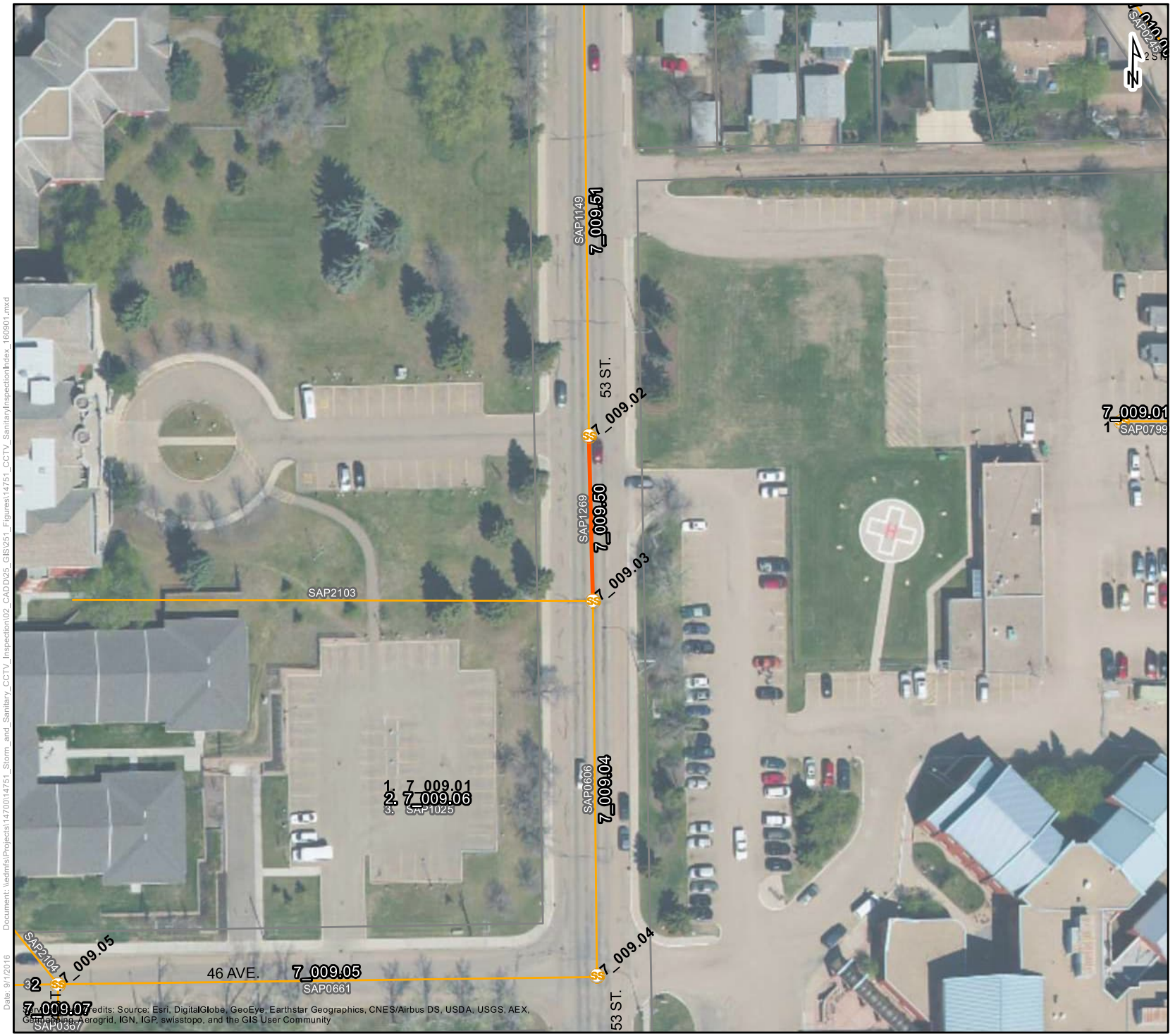
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STORM AND SANITARY
CCTV INSPECTION

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Legend

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- Sanitary Pipe
- Sanitary Pipe: To be inspected

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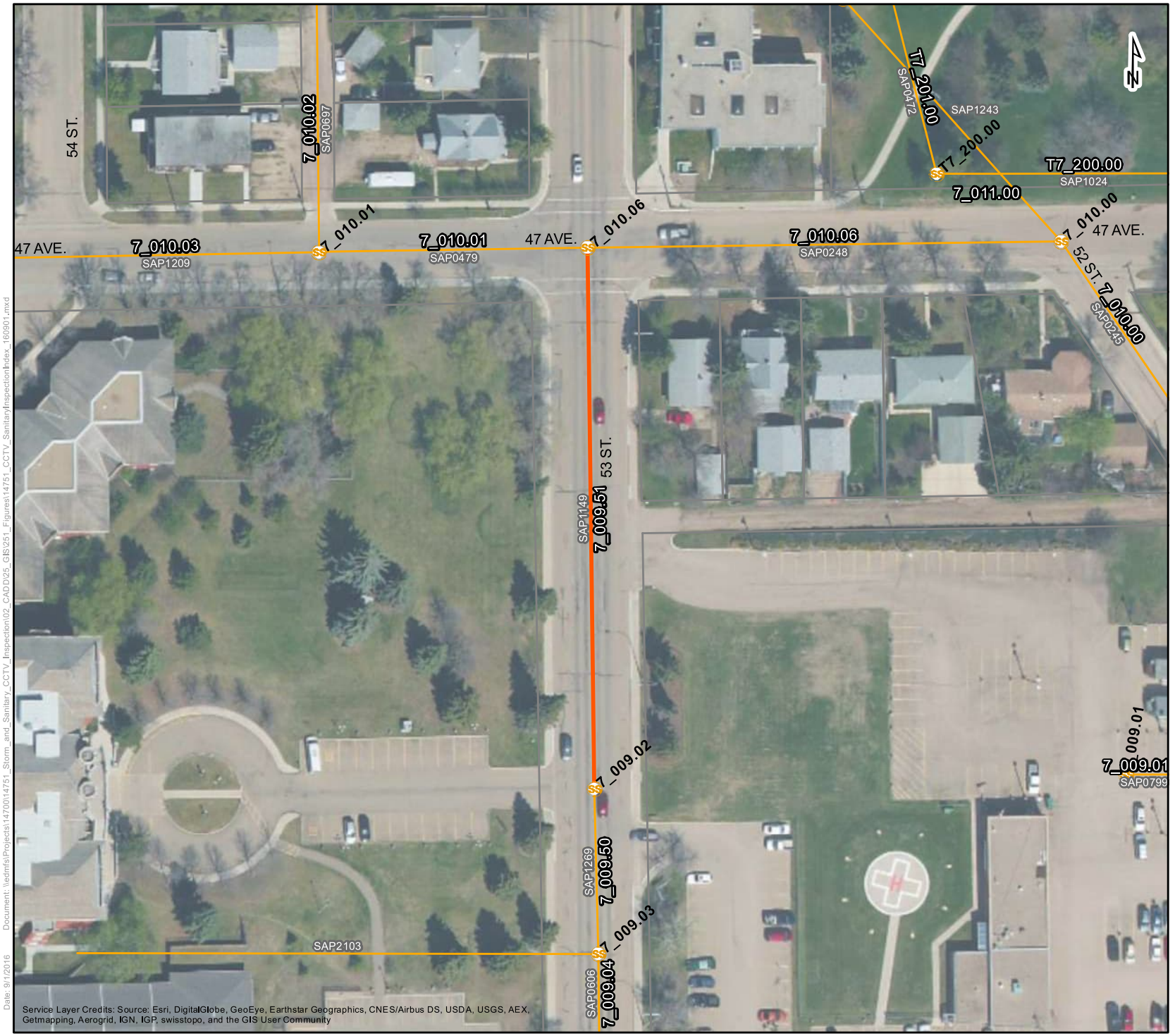
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CCTV INSPECTION

CITY OF Camrose

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- Sanitary Pipe: To be inspected

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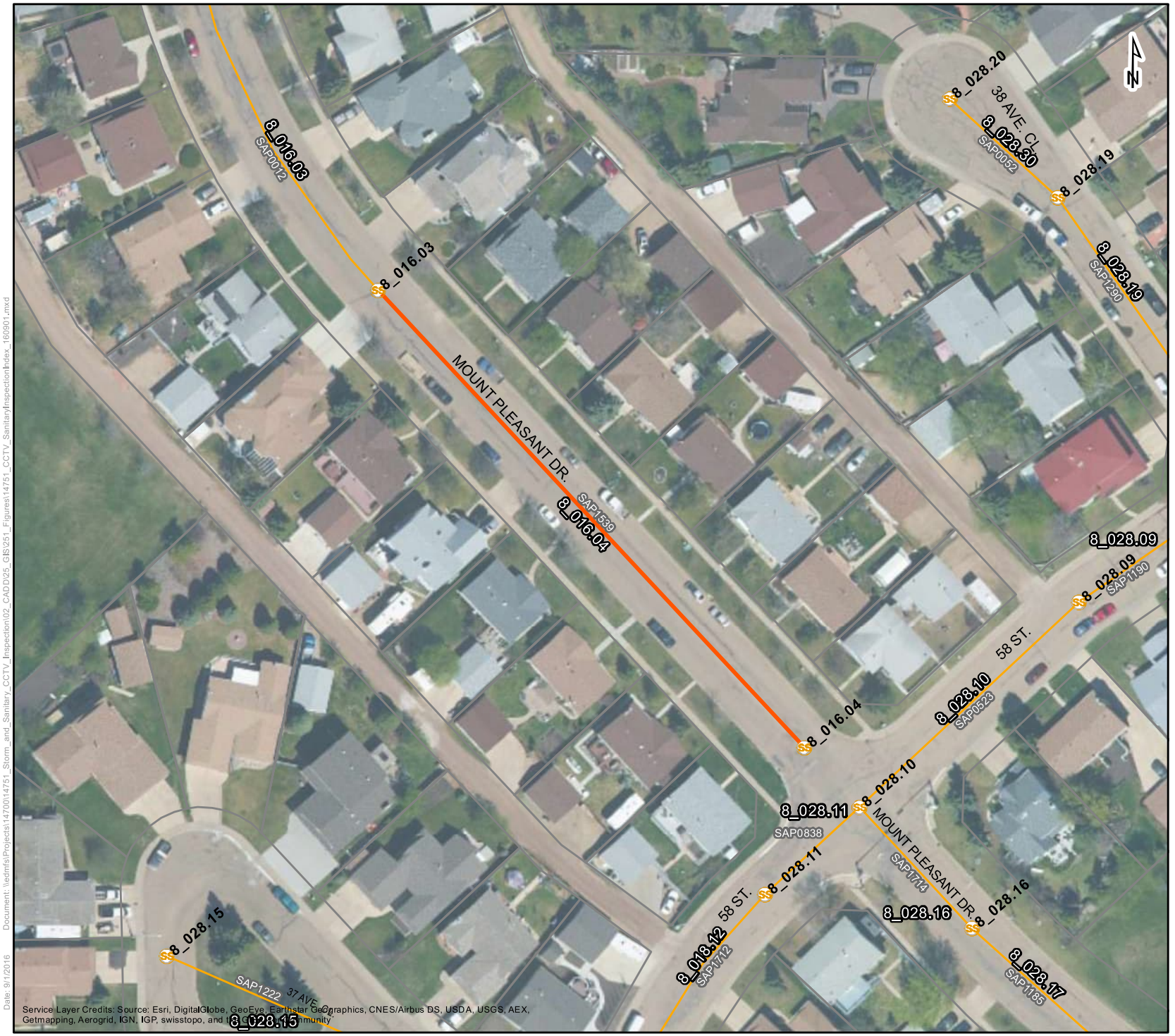
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PIPE ID: 7_009.51
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

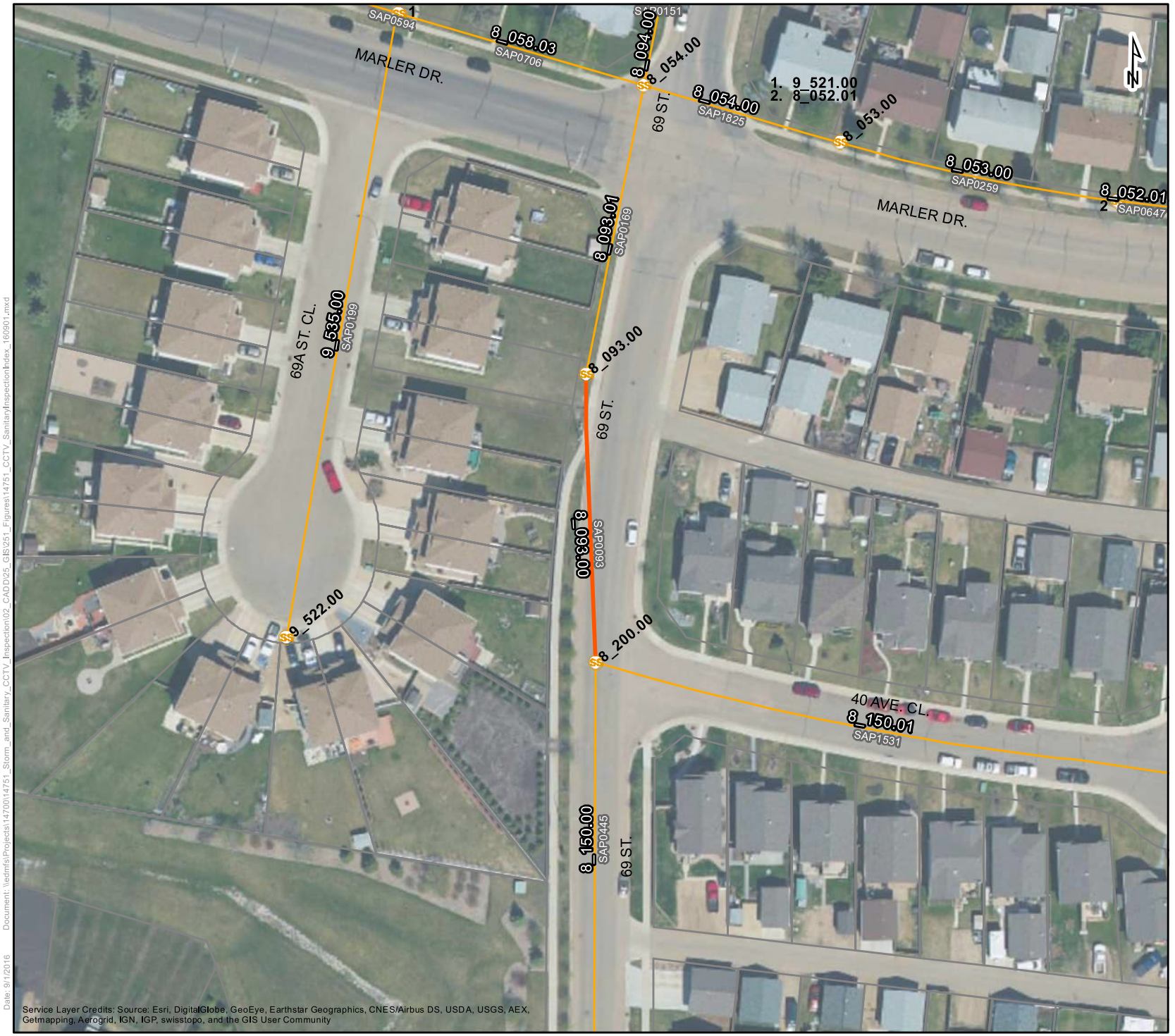
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SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

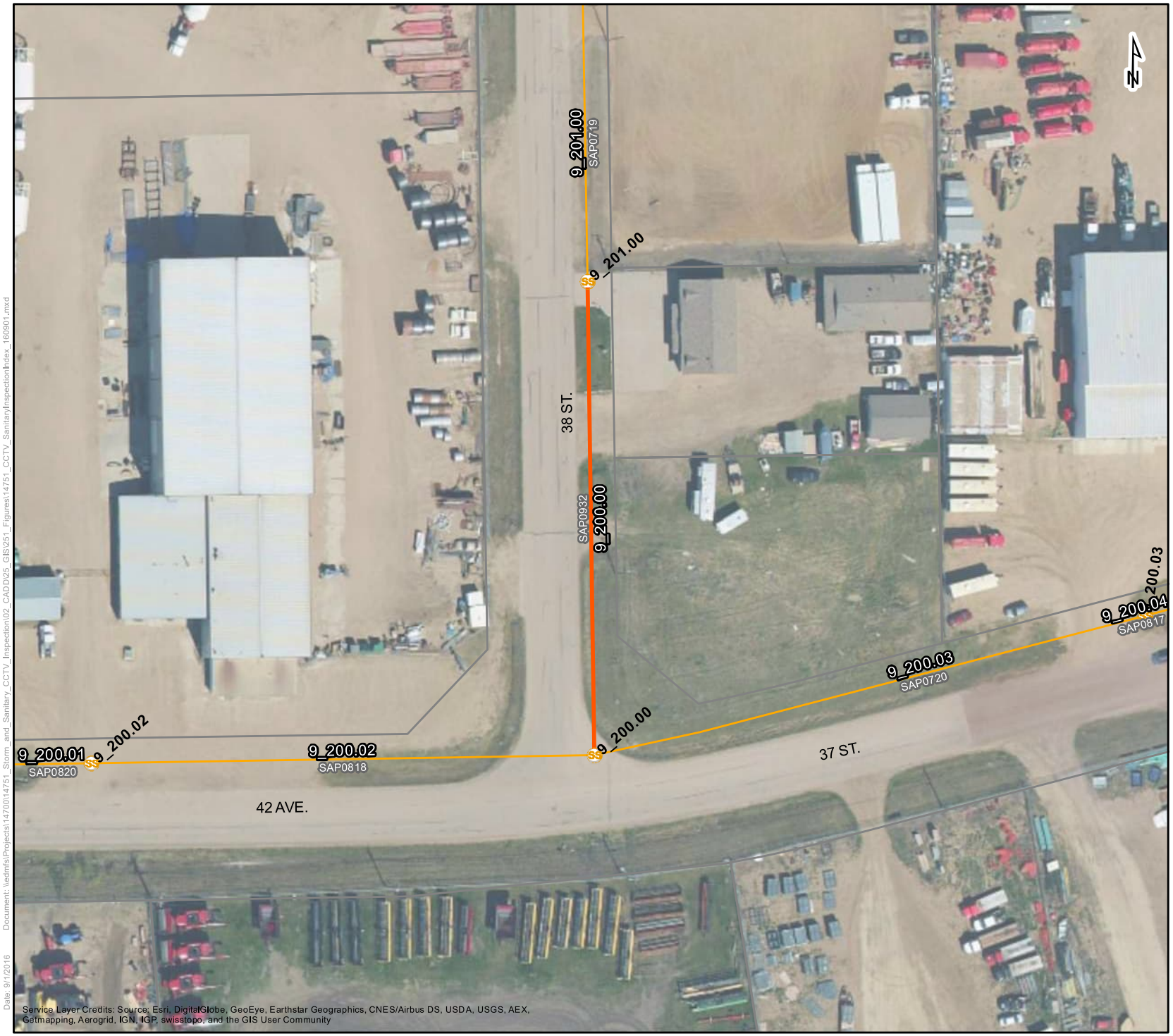
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SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Sanitary Manhole
- Sanitary Pipe
- Sanitary Pipe: To be inspected

1:1000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 9_200.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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ISL Engineering and Land Services

Date: 9/1/2016 Document: \\edmfs\Projects\147001\14751_Storm_and_Sanitary_CCTV_Inspection\02_CADD\25_GIS\251_Figures\14751_CCTV_SanitaryInspectionIndex_160901.mxd

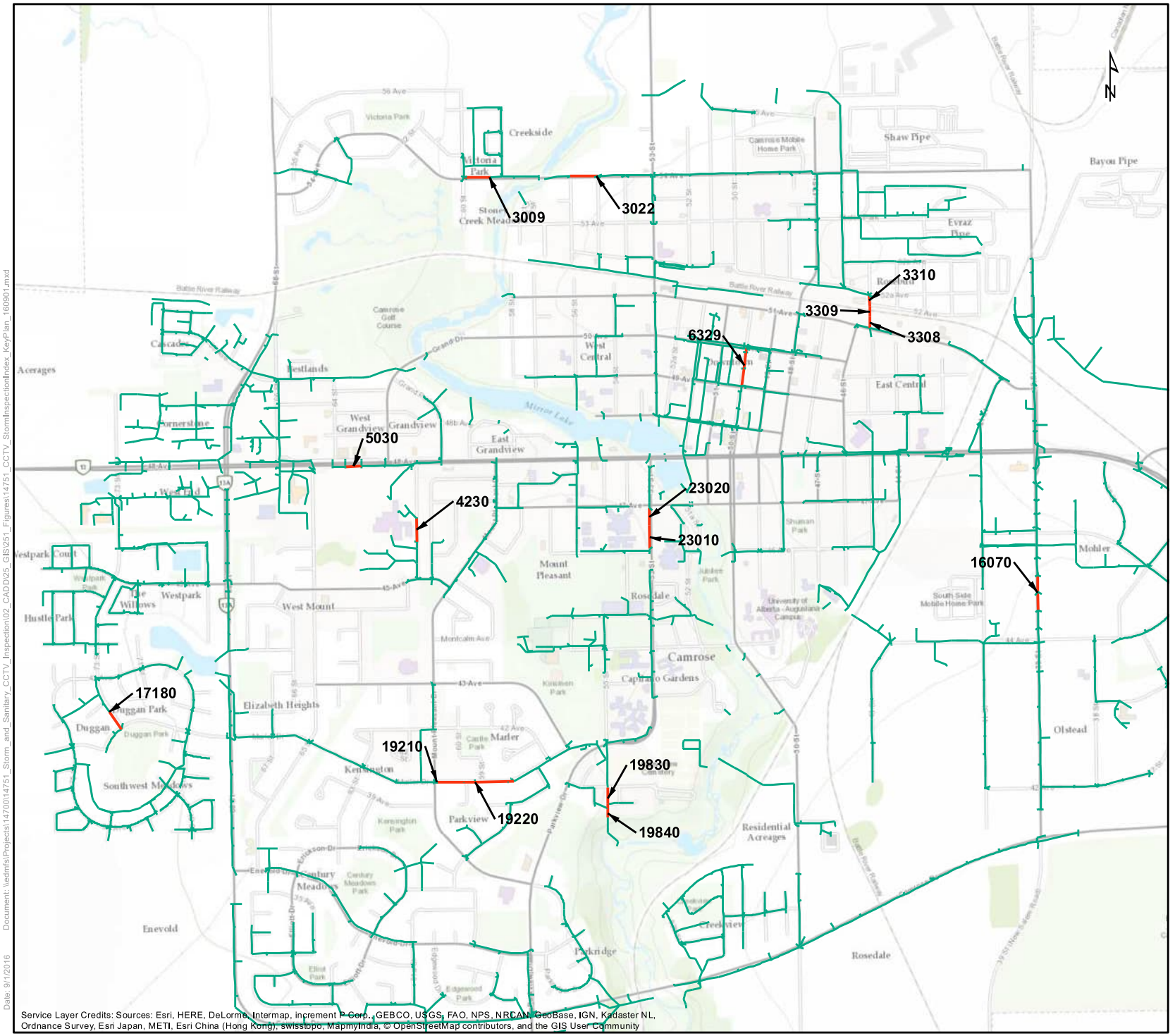
14751 City of Camrose Storm and Sanitary CCTV Inspections

Phase 1 Sanitary Sewers

Phase 1 - Main Line Survey Log

Segment No.	Built in	Location		Properties						CCTV Inspection					Assessment				Preliminary Budget Pricing Based on Nominal Bury Depth of (3-4m)											
		Street	Crossroad 1	Pipe ID	Start MH	End MH	Sewer Length m	Avg. Depth m	Pipe Dia.	Pipe Material	Direction	Surveyed Length	%Inspected	Inspection Aborted	Reason Aborted	Struct. Grade	Ops. Grade	Priority	Condition Remarks	Rehabilitation Comments	Flush and Camera	Mechanically Clean and Camera	Trim Protruding Service Connection/Re connect Service	Spot Repair Excavation per m	Full Length Repair Excavation	200mm Spot Repair Liner $ 3,200 each	200mm Full Length Liner/ 385 all inclusive of Pre-lining cleaning, CIPP and warranty cleaning and CCTV per m.	250mm Spot Repair Liner $ 3,500 each	250mm Full Length Liner $ 425 all inclusive of Pre-lining cleaning, CIPP and warranty cleaning and CCTV per m.	300mm Spot Repair Liner $ 3,800 each	300mm Full Length Liner $ 450 all inclusive of Pre-lining cleaning, CIPP and warranty cleaning and CCTV per m.	Priority 1		Priority 2		Priority 3	
																														Minimum Rehabilitation	Recommended Rehabilitation	Minimum Rehabilitation	Recommended Rehabilitation	Minimum Rehabilitation	Recommended Rehabilitation
																					$20.00	$42.00	$650.00	$1,200.00	$750.00	$3,200.00	$385.00	$3,500.00	$425.00	$3,800.00	$450.00						
1a	1996	47 Street	46 Avenue	SAP0128	3_130.02	3_130.00	102	**3.56**	200	VCP	Down	10.2	10.0%	Yes	Protruding lateral	2	3	2	Sewer in reasonable structural condition with exception 0.9m downstream of MH 3_130.02 where material change from PVC to VCT. Spiral and longitudinal cracks to next joint.	Trim protruding service connection @ 10.2m* Apply CIPP spot reline of service connection of <1m and Re camera section *(See below for outstanding camera work)			$650.00			$3,200.00							$3,850.00			
1b	1996	47 Street	46 Avenue	SAP0128 R	3_130.00	3_130.02	102	**3.56**	200	VCP	UP	31.7	31.1%	Yes	Protruding lateral	2	3	2	Multiple grade changes of vertical alignment. Sags and open joints through out run.	Trim protruding service connection @ 31.7m* Apply CIPP spot relining of service connection of <1m and Re camera section	$2,040.00		$650.00			$3,200.00							$5,890.00			
2a	1911	48 Street	49 Avenue	SAP0510	3_236.00	3_269.00	172.5	**3.2**	200	VCP	Up	57	33.0%	Yes	Protruding lateral	2	2	1	Sewer in reasonable structural condition with exception 0.9m to 5m upstream of MH 3_236.00. Minor Circumferential cracks @ 33.5 and 46m	Apply CIPP spot reline 0.9 to 5m * Apply CIPP spot reline of service connection of <1m @ 26.8m * Cut protruding service connection @ 57 m and Re-camera section upstream to MH 3_269			$650.00			$6,400.00						**$7,050.00**						
2b	1911	48 Street	48 A Avenue	SAP0510 R	3_269.00	3_236.00	172.5	**3.2**	200	VCP	Down	72.9	42.3%	Yes	Protruding lateral	5	2	1	Pipe is Broken In several locations, multiple longitudinal and circumferential cracks, and exposed earth at service lateral.	Excavate and conduct point repair 21m to 26m downstream of 3_269.00 * Trim protruding connection at 79m and Re-camera remaining section *Install CIPP liner the entire length if feasible. May require excavate and replace with SDR 35 depending on remaining CCTV review	$3,450.00		$650.00	$7,200.00	$30,750.00		$66,412.50					$11,300.00	$30,750.00	Full liner if applicable = $66,412.50				
3	1956	48 Avenue	Mount Pleasant Dr	SAP0529	5_009.00	5_008.00	85.5	**5.1**	250	VCP	Down	84.1	98.4%	No	N/A	2	2	2	Pipe is in fair structural shape. Many deviations in horizontal and vertical alignment.	Mechanically clean pipe over the first 20m downstream of MH 5_009.00 * Actively flush line to maintain positive operational capacity due to multiple changes in vertical alignment		$1,050.00												$1,050.00	$1,050.00		
4	1959	53 Street	46 Avenue	SAP0606	7_009.04	7_009.03	70.5	**2.6**	200	VCP	Down	69.7	98.9%	No	N/A	1	1	4	NOTE: CCTV quality poor from 60m downstream of MH 7_00904 to end of run.	None at this Time															
5	Unknown	Laneway between 49th and 50th Streets	50 A Avenue	SAP0736	3_249.00	3_258.00	116.5	**4.2**	200	VCP	Down	34.3	29.4%	Yes	Protruding lateral	5	3	1	NOTE: No reverse run completed due to bricks in sewer upstream of MH 3_258.00 * Visible holes in Pipe, migration of soil into sewer possible * Considerable encrustation present * Vertical and horizontal deviation in alignment creating poor hydraulic performance.	Immediate point repair of sewer 34m upstream of MH 3_249.00 * Point repair, remove bricks 1m downstream of MH 3_258.00 * Mechanical cleaning of sewer * Trim protruding service connection @ 34.3 upstream of MH 3_249.00 * Re-camera remainder of section			$650.00	$7,200.00								**$12,743.00**						
6a	Unknown	Laneway between 49th and 50th Streets	49 Avenue	SAP1558	3_248.00	3_247.00	87.5	**4.2**	250	VCP	Down	48.1	55.0%	Yes	Encrustation from lateral	2	2	1	Note: Encrustation plugged service lateral 15.6m downstream of MH 3_248.00. All services exhibiting varying amounts of build up.	Mechanical cleaning of service connections followed by CIPP spot reline of the trimmed pipe. Each location of service connections have minor circumferential and longitudinal cracks in the vicinity. 3 locations of <5m CIPP spot reline locations at approx. 17m, 35m and 44m downstream of MH 3_248.00		$3,675.00	$1,950.00			$9,600.00			$37,187.50			$15,225.00		Full liner if applicable = $37,187.50				
6b	Unknown	Laneway between 49th and 50th Streets	50 Avenue	SAP1558 R	3_247.00	3_248.00	87.5	**4.2**	250	VCP	Up	35.8	40.9%	Yes	Encrustation from lateral	3	4	2	Pipe in poor operational condition upstream MH 3_247.00 for 17m * 80% constricted of service lateral @ 35.8m upstream of MH	Assess MH 3_247.00 for replacement if required. * Replace 17m of VCT with new SDR 35 and adjust grade to provide positive flow * Mechanical clean service connection @ 35.8 upstream and CIPP spot reline if required <1m			$650.00	$20,400.00				$3,500.00							$24,550.00	$24,550.00		
7a	Unknown	Laneway between 49th and 50th Streets	50 Avenue	SAP1162	3_249.00	3_248.00	85	**4.2**	250	VCP	Down	67	78.8%	Yes	Encrustation	4	3	1	Pipe in good conditions with good flow characteristics with the exception of 1 risk to structural integrity. Location MH 3_249.00 lead to 4m downstream.	CIPP Spot reline from MH 3_249.00 to 4m downstream * Mechanically clean encrustation @ 67m downstream * Apply CIPP spot reline of service connection of <1m @ 67m.		$420.00					$10,500.00					$10,500.00						
7b	Unknown	Laneway between 49th and 50th Streets	50 Avenue	SAP1162 R	3_248.00	3_249.00	85	**4.2**	250	VCP	Up	16.5	19.4%	Yes	Encrustation	2	3	1	Pipe in good condition with good flow characteristics with one the exception of hanging encrustation 16.5 m upstream of MH 3_248.00	Mechanically clean encrustation at 10.4m and 16.5m upstream of MH 3_248.00 * CIPP spot reline of service connections @ 10.4m <1m * Re-assess pipe at 16.5m after mechanical cleaning		693					$7,000.00					$7,693.00						
8	2002	69 Street	40 Avenue Cl	SAP0093	8_200.00	8_093.00	54.5	4.3	250	PVC	Down	18.4	33.8%	Yes	Line full of settled deposits	1	4	1	Line is plugged with settled debris Note: Flow direction wrong on GIS	Investigate drop structure at 8_093.00. Uncap overflow if possible, and allow for flushing of sewer downstream of MH	$1,090.00											$1,090.00						
9	1911	50 Street	50 Avenue	SAP0810	3_272.01	3_273.00	109.5	2.5	200	VCP	Down	25.4	23.2%	Yes	Protruding lateral	5	5	1	Pipe in extreme structural distress, placing of CIPP liner doubtful. Repair immediately	Excavate and replace sewer with new 200mm SDR 35. Note: No reverse run available for this section. Bottom of sewer is missing at MH3_273.00, it can be assumed the entire length (109.5m) should be excavated and replaced with new 200mm SDR 35	$1,700.00				$19,050.00							$20,750.00		1) Full remove and replace $76,650 -2) if applicable R/R plus liner $35,560				
10	1911	50 Street	50 Avenue	SAP1197	3_273.00	3_274.00	93.5	2.5	200	VCP	Down	80.4	86.0%	Yes	Line full of settled deposits	3	3	2	Pipe exhibits poor to fair condition over the length observed. Line is blocked with settled deposits which flushing could not remove. Blockage needs to be removed before the full length can be assessed. Without access from the upstream MH placing spot repairs liners is not possible. No reverse run available	2 CIPP spot relines to be placed at locations 20m to 26m, and 41 to 56m downstream of MH 3_273.00. Remove settled blockage at 80.4m and re camera. A feasible solution may be a full length liner, but the reminder of the section must be opened to access and assessment.		$1,050.00				$4,800.00	$11,550.00							$17,400.00	Full liner if applicable = $35,805.00		
11a	1971	63 Street	48 Avenue	SAP1132	4_016.00	4_015.00	41	5.3	300	VCP	Down	0	0.0%	Yes	Camera underway water		5	1	Assessment not possible	See below																
11b	1971	64 Street	48 B Avenue	SAP1132 R	4_015.00	4_016.00	41	**5.3**	300	VCP	Up	6	14.6%	Yes	Encrustation		5	1	Assessment not possible	Mechanically clean pipe of encrustation and re camera and re assess condition of sewer section.		1722									$1,722.00						
12	1959	53 Street	46 Avenue	SAP1149	7_009.04	7_009.03	70.5	3.6	200	VCP	Down	20.6	29.2%	Yes	Sewer flowing at capacity		5	1	Assessment not possible	Actively flush sewer to ensure flows are not being surcharged. Assess flow at peak periods. Re camera section, if not possible due to capacity demands, consider bypass pumping of the section.	$1,410.00										$1,410.00						
13a	1911	48 Street	48 Avenue	SAP0396	3_270.00	3_269.00	70	2.8	200	VCP	Down	1.5	2.1%	Yes	Pipe is broken@ crown of pipe, void is visible	5	5	1	Assessment not possible	Excavated point repair required immediately, 0 to 4m downstream of MH 3_270.00					$7,200.00					$7,200.00						
13b	1911	49 Street	49 Avenue	SAP0396 R	3_269.00	3_270.00	70	**2.8**	200	VCP	Up	32	45.7%	Yes	Protruding lateral	1	2	2	Section observed in satisfactory condition	Trim protruding service connection and apply <1m. spot reline * CCTV remainder of section and evaluate	$800.00		$650.00			$3,200.00							$4,650.00			
14	1944	50 Avenue	45 Street	SAP1066	3_420.00	3_410.00	24.5	3.7	200	VCP	Down	22.4	91.4%	No	N/A	2	2	3	Section observed in satisfactory condition, with the exception of the last 3m where the sewer appears to have negative grade.	Flush downstream to ensure there is positive flow to MH 3_400.11	$460.00														$460.00	
15	1944	50 Avenue	46 Street	SAP1642	3_430.00	3_420.00	109	3.9	200	VCP	Down	106.2	97.4%	No	N/A	2	3	1	Section in fair structural condition. With the exception of two fractured locations @ 66.7m and 106m downstream of MH 3_430.00	Trim protruding service connection at 67.4m apply CIPP 2m spot reline * Evaluate and if feasible to apply <2m spot reline at 104, if unsuccesful excavate and repair broken pipe leading into MH 3_420.00			$650.00	$7,200.00		$6,400.00					$7,050.00	$7,200.00					
16a	1949	45 Street	50 Avenue	SAP0468	3_400.05	3_410.00	99.5	4	200	VCP	Up	44.3	44.5%	Yes	Protruding lateral	2	2	2	Section in fair structural condition. Many deviations in horizontal and vertical alignment affecting operational efficiency.	Trim protruding service connection at 44m and apply <1m. CIPP spot reline * CCTV remainder of section and evaluate	$700.00		$650.00			$3,200.00							$4,550.00	$4,550.00		
16b	1949	45 Street	50 Avenue	SAP0468 R	3_410.00	3_400.05	99.5	**4**	200	VCP	Down	17.4	17.5%	Yes	Protruding lateral	3	2	2	Section in fair to poor structural condition. Many deviations in horizontal and vertical alignment affecting operational efficiency. Internal surface of sewer is smaling	Trim protruding service connection at 17.4m and apply <1m. CIPP spot reline * CCTV remainder of section and evaluate (See above for CCTV)			$650.00			$3,200.00	$7,700.00						$3,850.00	$7,700.00				
17	1959	53 Street	46 Avenue	SAP1269	7_009.03	7_009.02	31	2.8	200	VCP	Down	29.7	95.8%	No	N/A	2	4	2	Some minor structural cracking observed. Poor hydraulic performance noted.	Conduct geodetic survey and obtain upstream and downstream inverts for this section. Evaluate and if feasible consider excavating to correct vertical alignment.					$23,250.00						$23,250.00	$23,250.00					
18	1971	58 Street	53 Avenue	SAP0894	2_020.00	2_010.00	88.5	Unknown	200	VCP	Down	88.5	100.0%	No	N/A	1	4	2	Root propagation present in the mainline joints and service laterals	Consider full length CIPP reline of concrete sewer before further degradation of surface occurs thereby comprising the structural integrity of the pipe * Investigation found unknown Manhole 60m downstream of 2_130.00 apply benching to match new CIPP liner. (See Below)		$3,717.00					$34,072.50							$3,717.00	Full liner = $34,072.5 c/w service laterals @ $8,000 each = $90.072.50		
19a	1983	54 Avenue	56 Street	SAP0303	2_130.00	2_140.00	118	1.9	200	Concrete	Down	60.1	50.9%	Yes	Displaced pipe	3	3	2	Pipe has exposed aggregate surface through out the length observed, with some structural cracking .	Consider full length CIPP reline of concrete sewer before further degradation of surface occurs thereby comprising the structural integrity of the pipe * Investigation found unknown Manhole 60m downstream of 2_130.00 apply benching to match new CIPP liner. (See Below)						$6,400.00							$6,400.00	See below for liner estimate				
19b	1983	55 Avenue	57 Street	SAP0303 R	2_140.00	2_130.00	118	**1.9**	200	Concrete	Up	42	35.6%	Yes	Settled debris	3	4	2	Pipe has exposed aggregate surface through out the length observed, with some structural defects. Pipe invert has collected gravel and debris in flat sections.	Consider full length CIPP reline of concrete sewer before further degradation of surface occurs thereby comprising the structural integrity of the pipe * Provide additional flushing of sewer to remove settled deposits ASAP * CCTV remainder of section and evaluate approx. 20m	$500.00						$45,430.00							$500.00	$45,430.00				
20a	1941	57 Street	49 Avenue	SAP0412	3_025.02	3_025.00	140	3.7	200	VCP	VCP	52.4	37.4%	Yes	Protruding lateral	2	2	2	Sewer in good condition for the portion of CCTV available, * Sag noted over the first 10m downstream MH 3_025.02	Trim protruding service connection @51m downstream of MH 3_025.02 apply <1m CIPP spot reline at location			$650.00			$3,200.00					$3,200.00						
20b	1941	57 Street	49 Avenue	SAP0412 R	3_025.00	3_025.02	140	**3.7**	200	VCP	Up	89.3	63.8%	Yes	Protruding lateral	5	3	1	Pipe in good structural condition over section covered by CCTV, with the exception of 5m section 77m upstream of MH 3_025.02	Evaluate and if feasible to apply 5m CIPP spot reline starting at 77m upstream of MH 3_025.00, if evaluation negative, excavate and repair broken pipe and service connection			$650.00	$7,200.00		$4,800.00					$4,800.00	$7,850.00					
21	1941	57 Street	50 Avenue	SAP2134	3_025.03	3_025.02	32	3.7	200	VCP	Up	31.9	99.7%	No	N/A	1	4	2	Pipe in good structural condition. *Operational efficiency affected by downstream surcharging.	MH 3_025.03 to 3_025.00 maintain a current and progress re flushing/maintenance program to remove grease and debris build.	$640.00													$640.00	$640.00		
22	1953	57 Street	50 Avenue	SAP0061	3_560.00	3_025.3	86	3.7	200	VCP	Down	8.9	10.3%	Yes	Camera under water			2	Assessment not possible	Set up bypass pumping. Flush sewer and re camera	$1,720.00													$1,720.00	$2,720.00 Note: $1,000.00 added for bypass pumping		
23	1973	54 Avenue	58 Street	SAP0958	12_044.00	T_223.00	120.5	5.9	250	PVC	Down	119.6	99.3%	No	N/A	2	1	2	Section in acceptable condition with one exception, possible ruptured length at 12.6 downstream of MH 12_044.00	Determine if obstacle 12.6m downstream of MH 12_044.00 is in fact a service connection cored into the obvert of the pipe. If this is the case, mechanically clean service connection * Trim and place <1m CIPP spot reline at location and repair the protrusion.			$650.00			$3,200.00							$3,850.00	$3,850.00		
24	1964	48 B Avenue	Grand Drive	SAP0082	4_013.00	4_012.00	105	4.5	300	VCP	Down	103.2	98.3%	No	N/A	5	1	1	Section in sound structural condition with the exception of one location @ 101m downstream MH 4_013.00. Pipe is broken	Place CIPP liner <3m at 100m to 103m downstream of MH 4_013.00 into bench of MH 4_012.00								$4,560.00			$4,560.00	$4,560.00			$.	
25a	1971	48 B Avenue	Grand Drive	SAP0078	4_014.00	4_013.00	85	5.9	300	Concrete	Down	15.9	18.7%	Yes	Encrustation	3	3	2	Pipe has exposed aggregate surface through out the length observed.	Consider full length CIPP reline of concrete sewer before further degradation of surface occurs thereby comprising the structural integrity of the pipe									$38,250.00					$38,250.00	$38,250.00		
25b	1971	49 B Avenue	Grand Drive	SAP0079	4_013.00 R	4_014.00	85	**5.9**	300	Concrete	Up	0.8	0.9%	Yes	Encrustation		4	2	Assessment not possible	Mechanically clean sewer and re camera * Provide CCTV for assessment of section missing (see above description) Approx. 60m * Public works to remove encrustation @ MH 4_013.00 to allow for CCTV inspection		3570													$3,570.00	$3,570.00		
26	1973	64 Street	49 Avenue	SAP1042	4_017.00	4_016.00	53.5	5.3	300	VCP	Down	52.1	97.4%	No	N/A	3	2	2	Section structural and operational sound, with the exception of the service connections. * Minor to moderate structural risk.	Apply (2)CIPP spot relines at service connection locations. *Location, 9m to 19m downstream of MH 4_017.00 and 32m to 40m downstream of MH 4_017.00					$16,000.00				$23,400.00			$16,000.00	$23,400.00				
27a	1964	49 Avenue	Grand Drive	SAP0140	4_017.01	4_017.3	63	2.8	200	VCP	Down	0.7	1.1%	Yes	Broken Pipe	5	3	1	Downstream lead from MH 4_017.01 is severely broken affecting the first two service connections	Excavate and remove existing VCP to 4m downstream of MH 4_017.01 replace with new 200mm SDR 35 * Evaluate manhole , this may also require replacement in conjunction with sewer repair			$1,300.00	$6,000.00							$7,300.00	$7,300.00					
27b	1964	50 Avenue	Grand Drive	SAP0140 R	4_017.3	4_017.01	63	**2.8**	200	VCP	UP	12.4	19.7%	Yes	Encrustation	2	2	2	Joint encrustation prevalent enough to halt CCTV	See above (if possible start CCTV from MH 4_017.01)		2646													$2,646.00	$2,646.00		
28a	1973	50 Avenue	Grand Drive	SAP1854	4_017.02	4_017.01	46.5	3.1	200	VCP	Down	4.5	9.7%	Yes	Encrustation	1	3	2	Joint encrustation prevalent enough to halt CCTV	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section																		
28b	1973	50 Avenue	Grand Drive	SAP1854 R	4_017.01	4_017.02	46.5	**3.1**	200	VCP	Up	8.8	18.9%	Yes	Encrustation	1	3	2	Joint encrustation prevalent enough to halt CCTV	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section (see above description) Approx. 30 m		1974													$1,974.00	$1,974.00		
29a	1964	48 Avenue	Unknown	SAP 0850	6_002.01	6_002.00	103	3.3	200	VCP	Down	0.8	0.8%	Yes	Protruding lateral		3	2	Assesment not possible	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section			$650.00												$650.00	$650.00		
29b	1964	48 Avenue	Unknown	SAP 0850 R	6_002.00	6_002.01	103	**3.3**	200	VCP	Up	34	33.0%	Yes	Encrustation	1	3	2	Poor horizontal alignment. * Minor structural damage	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section (see above description) Approx. 70m		4326													$4,326.00	$4,326.00		
30a	1974	48 Avenue	Unknown	SAP0480	6_104.00	6_200.00	100	4	300	VCP	Down	54.5	54.5%	Yes	Encrustation	2	3	2	Severe encrustation deposits at some pipe joints.	Mechanically clean sewer and re camera locations of joints 35m-40m and @ 54.5m downstream of MH 6_104.00 * Be prepared to install <2m CIPP spot relines at these locations as removed deposits could cause structural defects						$6,400.00								$6,400.00	$6,400.00		
30b	1974	48 Avenue	Unknown	SAP0480 R	6_200.00	6_104.00	100	**4**	300	VCP	Up	18.1	18.1%	Yes	Encrustation	1	3	2	Severe encrustation deposits.	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section (see above description) Approx. 25m		4200													$4,200.00	$4,200.00		
31	1974	48 Avenue	Unknown	SAP1039	6_200.00	6_201.00	91.5	3.2	300	VCP	Down	5.4	5.9%	Yes	Encrustation	1	2	2	Severe encrustation deposits.	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section		$3,843.00																
32a	1967	48 Avenue	Unknown	SAP1848	6_202.00	6_201.00	69.5	3.5	300	VCP	Up	1	1.4%	Yes	Camera underwater		4	2	Assesment not possible	Dry bypass pumping to control flow, and re camera (See Below)																		
32b	1967	48 Avenue	Unknown	SAP1848 R	6_201.00	6_202.00	69.5	**3.5**	300	VCP	Down	43.6	62.7%	Yes	Encrustation	2	5	1	Viewable section shows multiple changes in vertical alignment causing poor hydraulic performance.	Mechanically clean sewer and re camera from 43.5m downstream of MH 6_201.00 to MH 6_202.00* Provide CCTV for assessment of missing section (see above description) Approx. 25m		3919										$3,919.00	$3,919.00				
33	1981	Mount Pleasant Drive	58 Street	SAP1539	8_016.04	8_016.03	117.5	3.4	200	PVC	Down	114.1	97.1%	No	N/A	1	2	3	Section in acceptable condition. PVC pipe does show some compression due to earth loading. This is probably a result of sub standard bedding compaction to provide lateral support	Maintain an active flushing and maintenance program. It appears MH cinder blocks have fallen into the system , they have been removed by IMS during the CCTV work. Evaluate upstream MH's for structural integrity.	$2,360.00															$2,360.00	$2,360.00
34a	1959	Laneway between 50 and 51 Streets	50 Avenue	SAP0474	3_250.00	3_260.00	120	3.9	250	VCP	Down	0.8	0.7%	Yes	Encrustation		4	2	Severe encrustation deposits. Assessment not possible	* Public works to remove encrustation @ MH 3_250.00_013.00 to allow for CCTV													$1,000.00	$1,000.00		
34b	1959	Laneway between 50 and 51 Streets	50 Avenue	SAP0474 R	3_260.00	3_250.00	120	**3.9**	250	VCP	Up	8	6.7%	Yes	Encrustation		4	2	Severe encrustation deposits. Assessment not possible	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section (see above description) Approx. 110m		5040												$5,040.00	$5,040.00		
35a	1959	Laneway between 50 and 51 Streets	50 Avenue	SAP1163	3_260.00	3_264.00	172.5	4.7	250	VCP	Down	9.3	5.4%	Yes	Encrustation		4	2	Severe encrustation deposits. Assessment not possible	Mechanically clean sewer and re camera * Provide CCTV for assessment of missing section. Approx. 160m		$7,245.00												$7,245.00	$7,245.00		
35b	1959	Laneway between 50 and 51 Streets	50 Avenue	SAP1163 R	3_264.00	3_260.00	172.5	**4.7**	250	VCP	Up	0	0.0%	Yes	Encrustation		4	2	Severe encrustation deposits. Assessment not possible	* Public works to remove encrustation @ MH 3_364.00 to allow for CCTV													$1,000.00	$1,000.00		
36	1977	39 Street	42 Avenue	SAP0932	9_200.00	9_201.00	89	3.7	250	VCP	Down	1.1	1.2%	Yes	Could not find downstream manhole			1	Aborted. Unable to find downstream manhole for reverse run.	*Public works to locate MH 9_201.00 and re camera section, provide CCTV for assessment	$1,780.00											$1,780.00	$1,780.00				
																			Subtotal											**$152,542.00**	**$236,109.00**	**$174,918.00**	**$316,068.50**	**$2,820.00**	**$2,360.00**

APPENDIX B
Phase 2 Storm Inspections
– Maps and Condition Assessments



Legend

Storm Pipes

To be inspected

Not to be inspected

1:23000

0 95 190 380 570 760 Meters

KEY PLAN
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

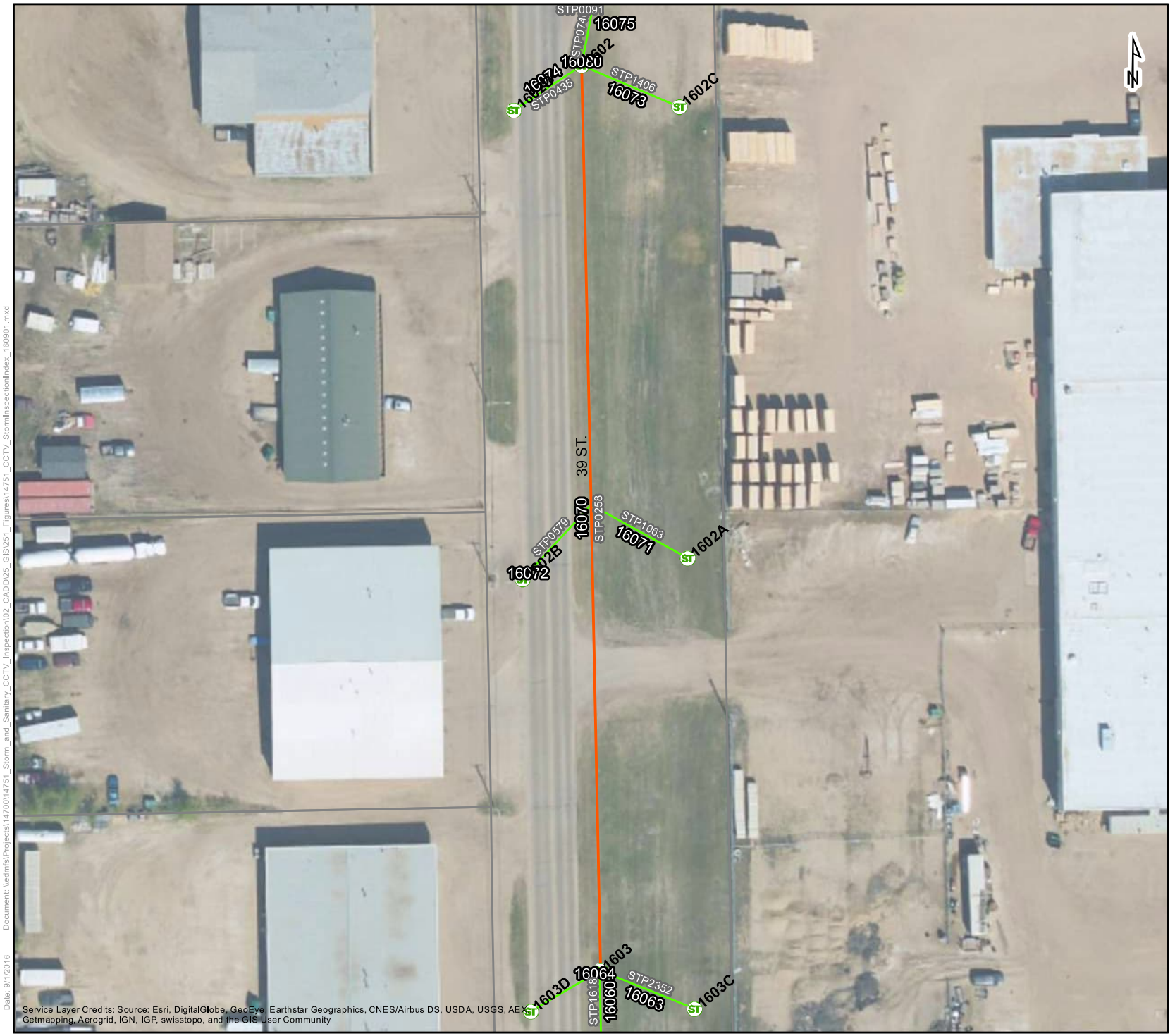
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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

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0 3.757.5 15 22.5 30 Meters

PIPE ID: 16070
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

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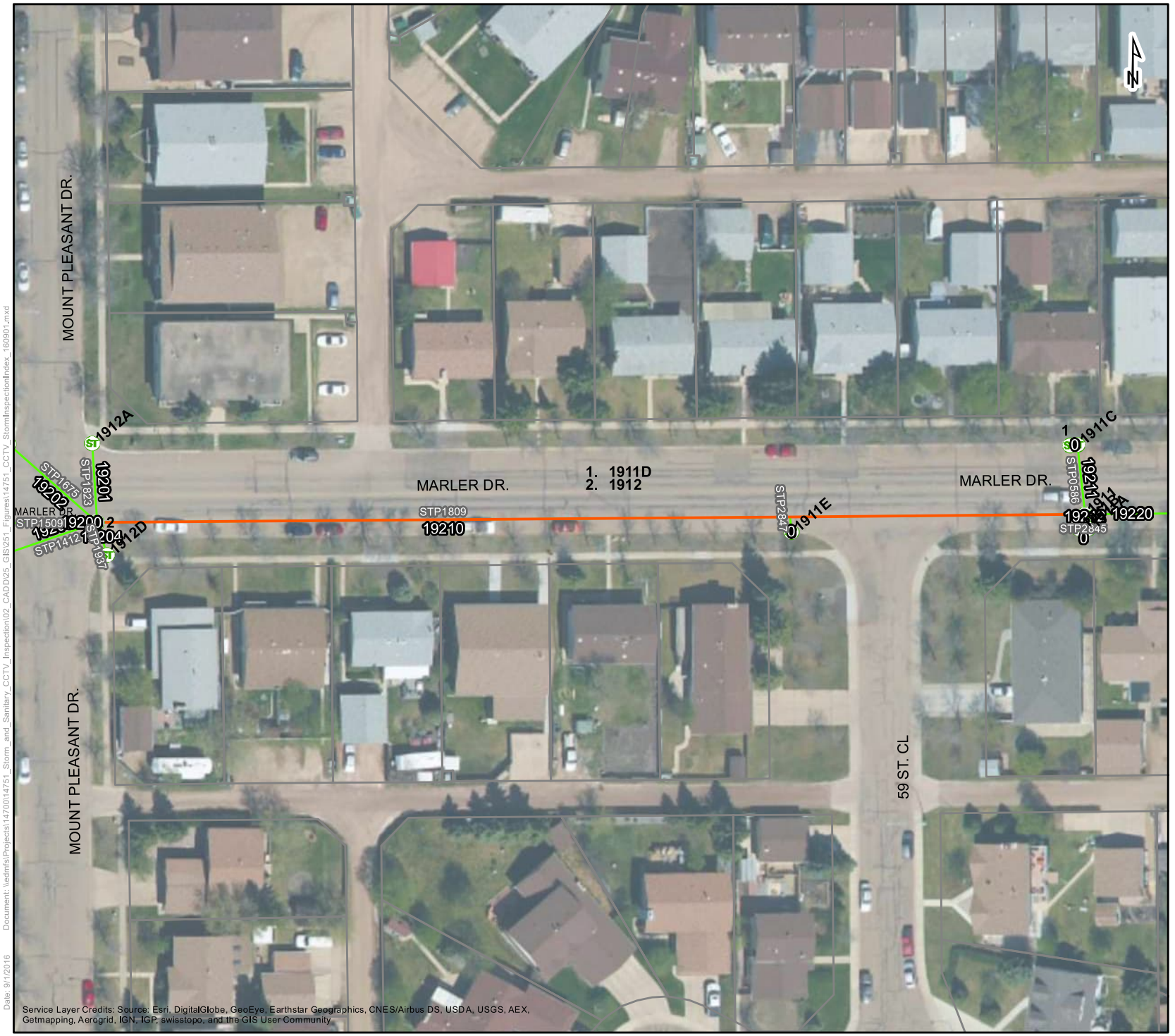
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Legend

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- Storm Pipe
- Storm Pipe: To be inspected

1:900

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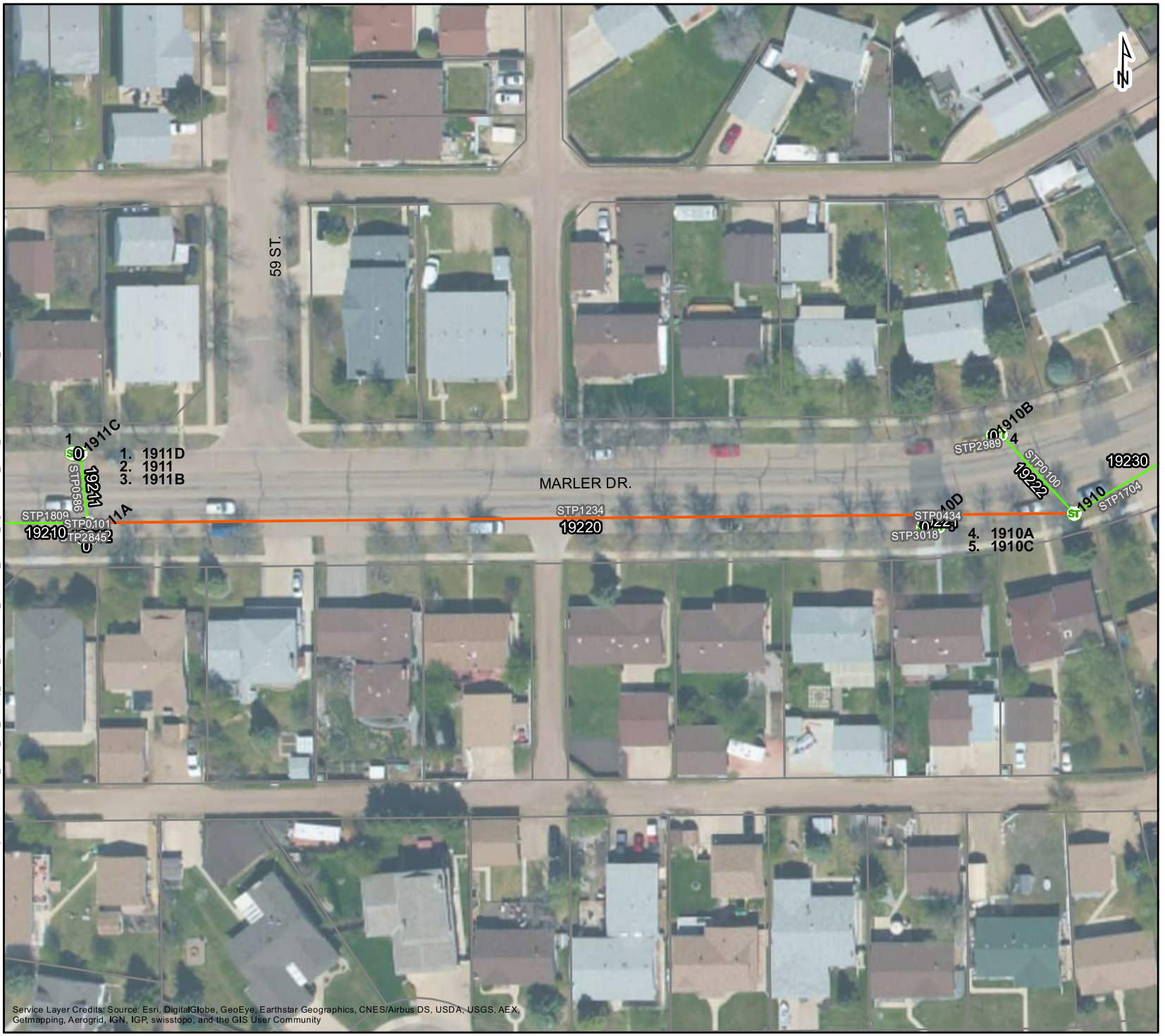
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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

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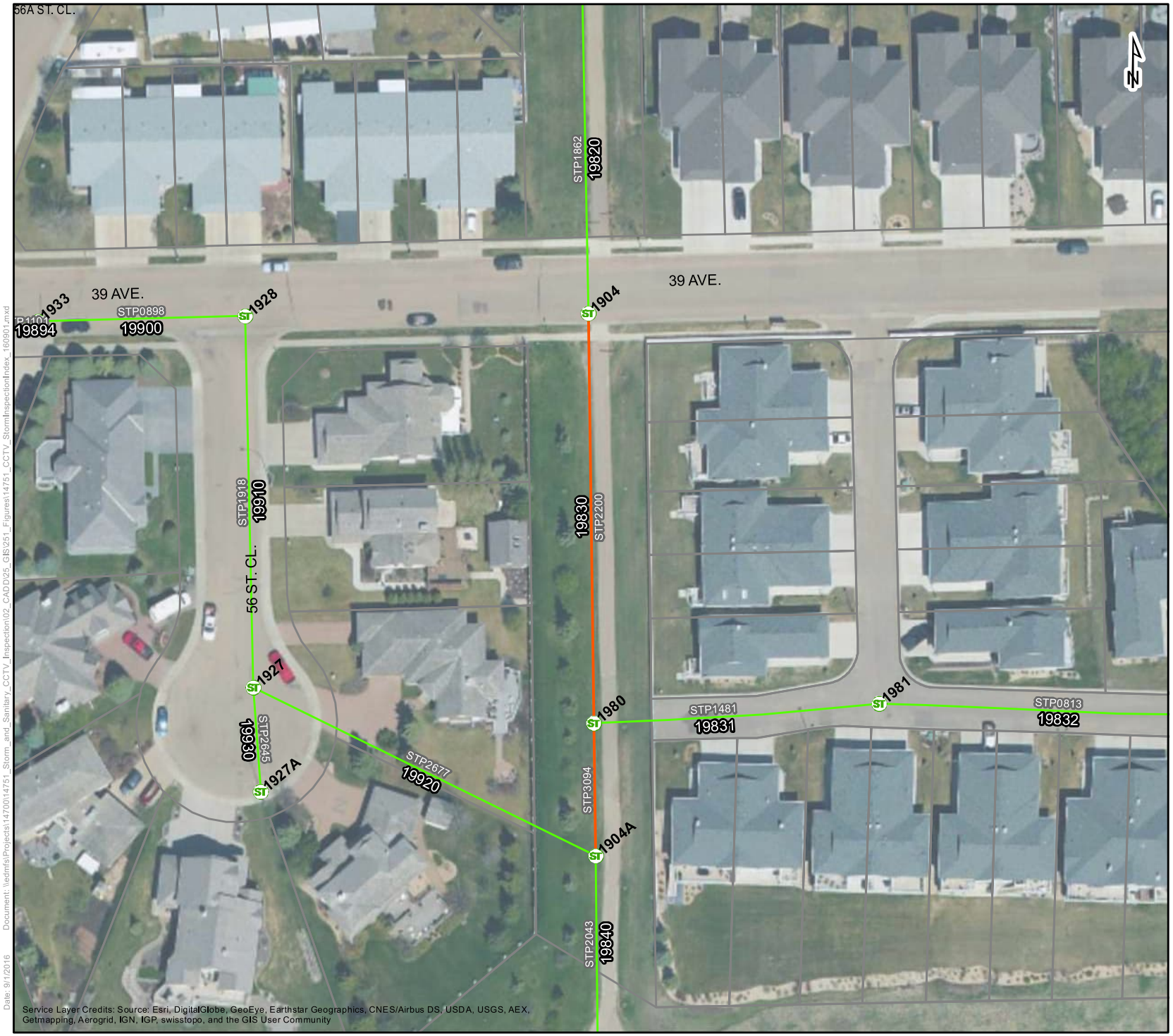
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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

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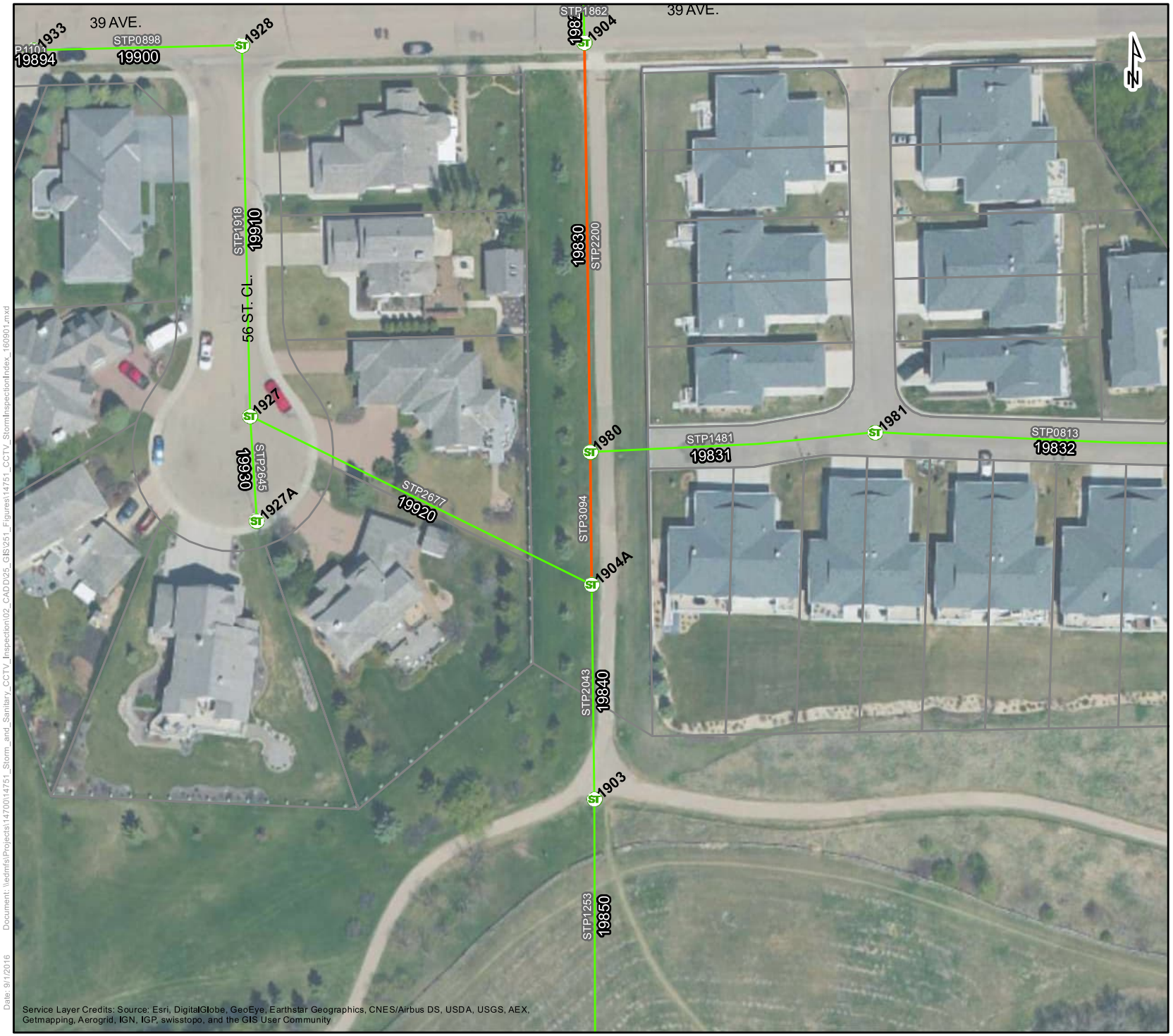
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Legend

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- Storm Pipe: To be inspected

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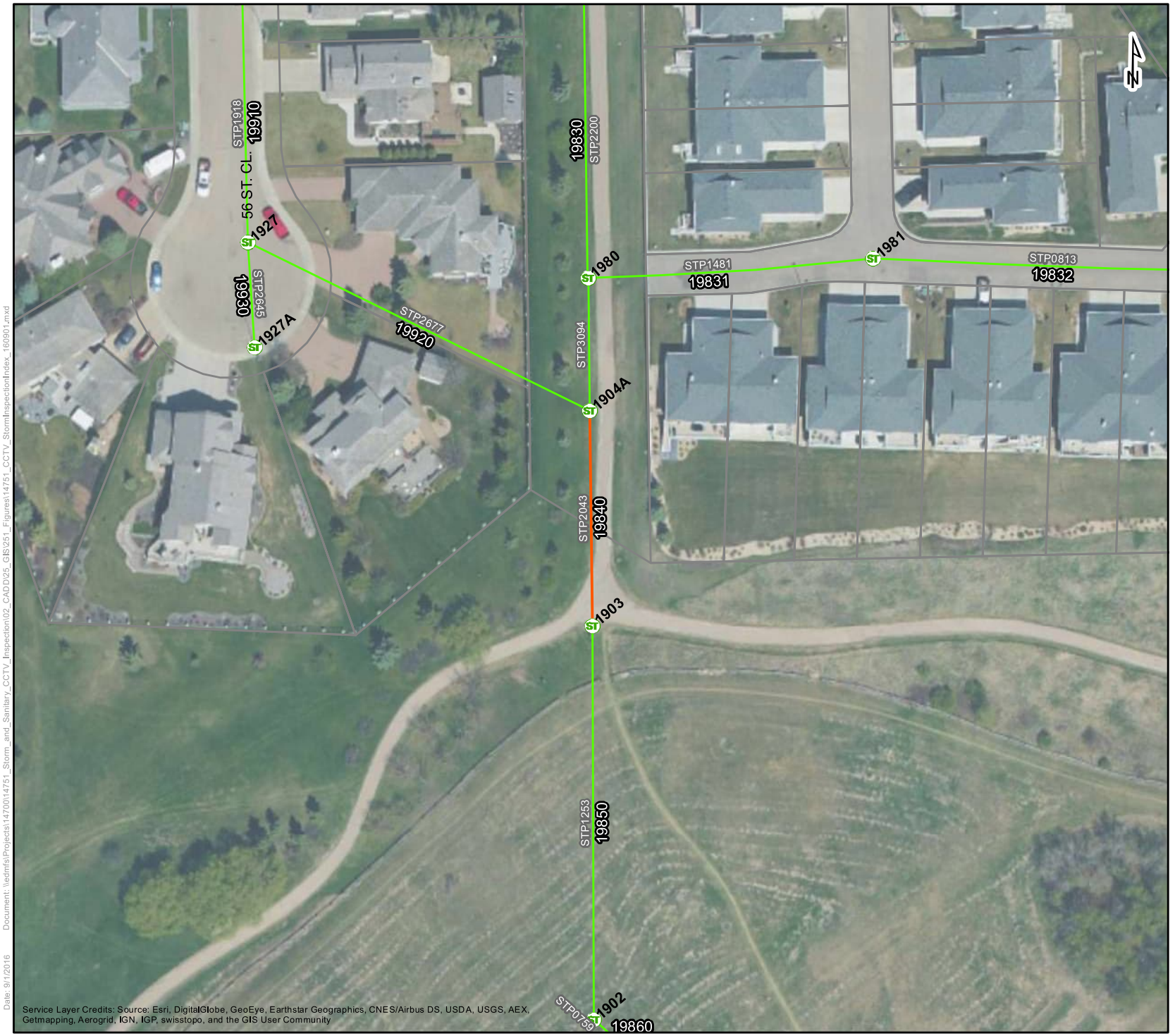
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Legend

- Storm Manholes
- Storm Pipe
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STORM AND SANITARY
CCTV INSPECTION

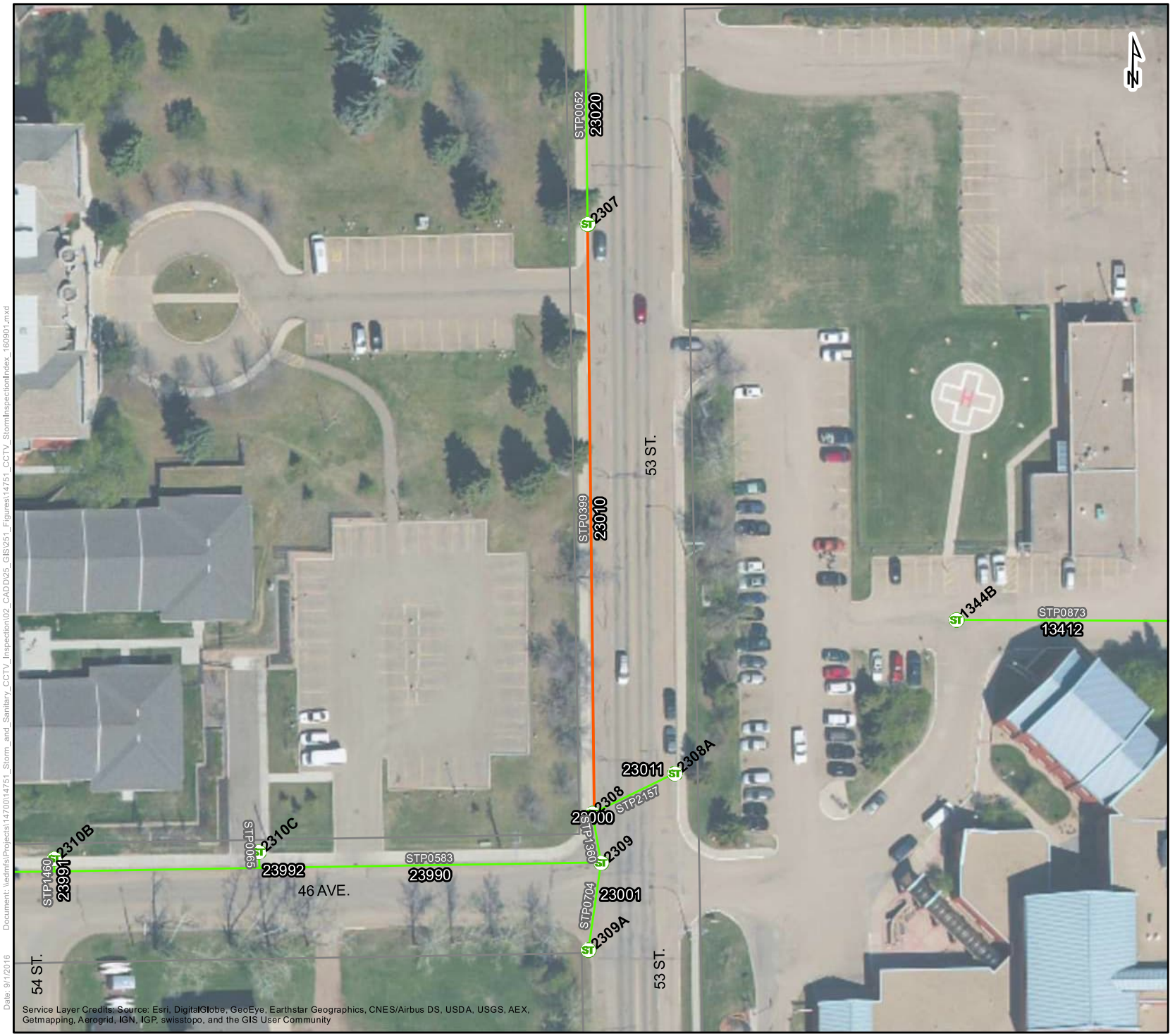
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- Storm Pipe
- Storm Pipe: To be inspected

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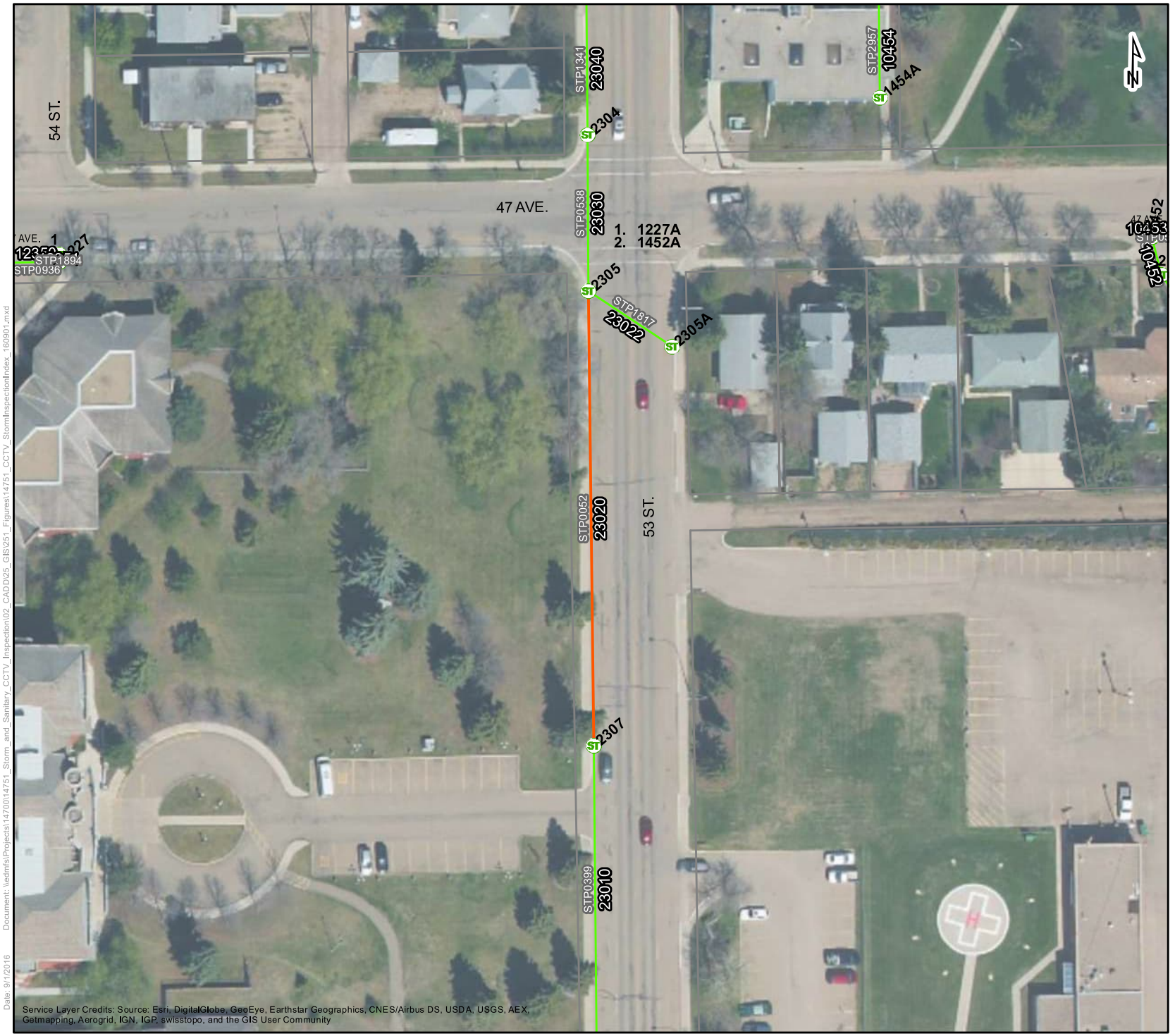
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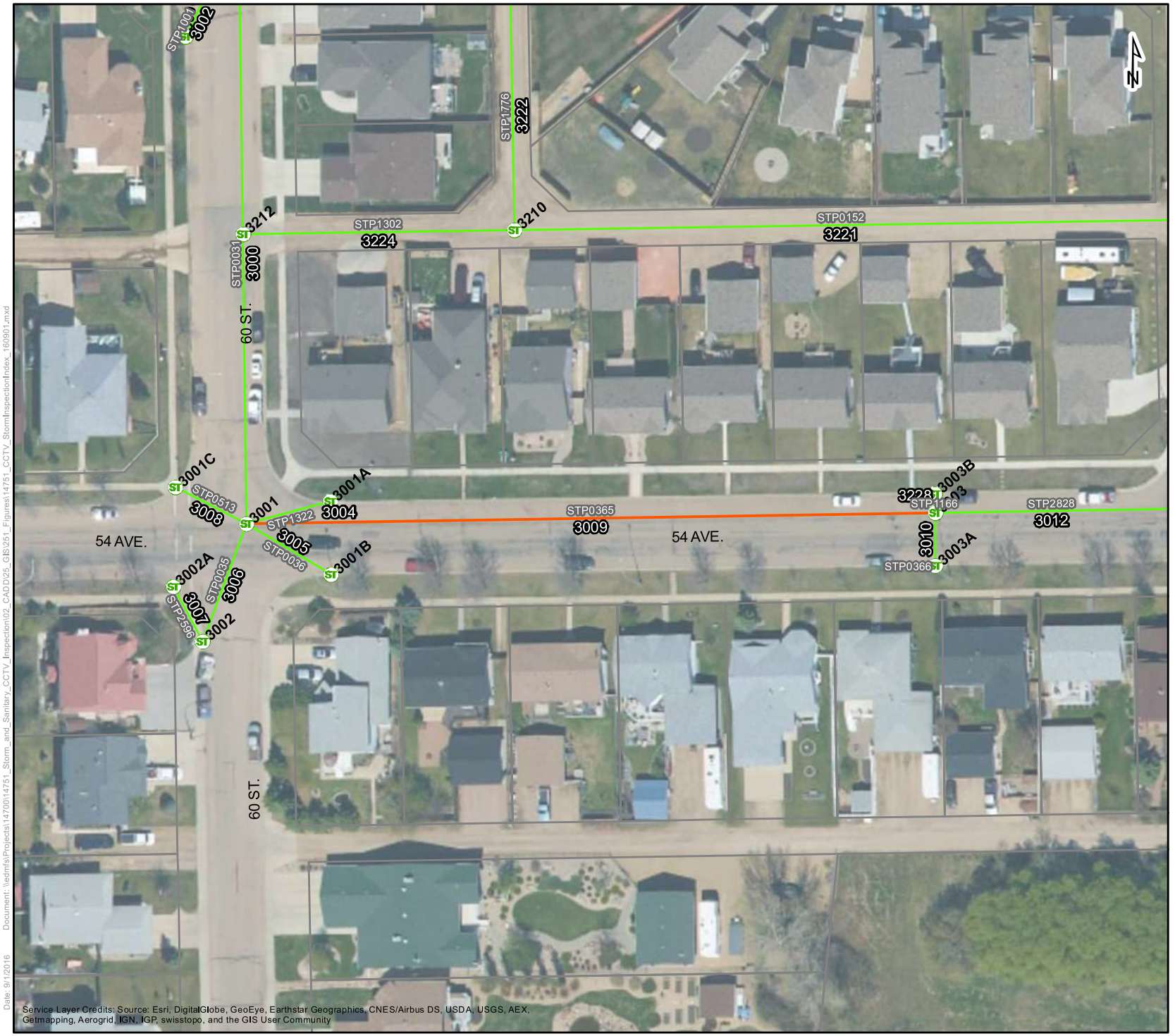
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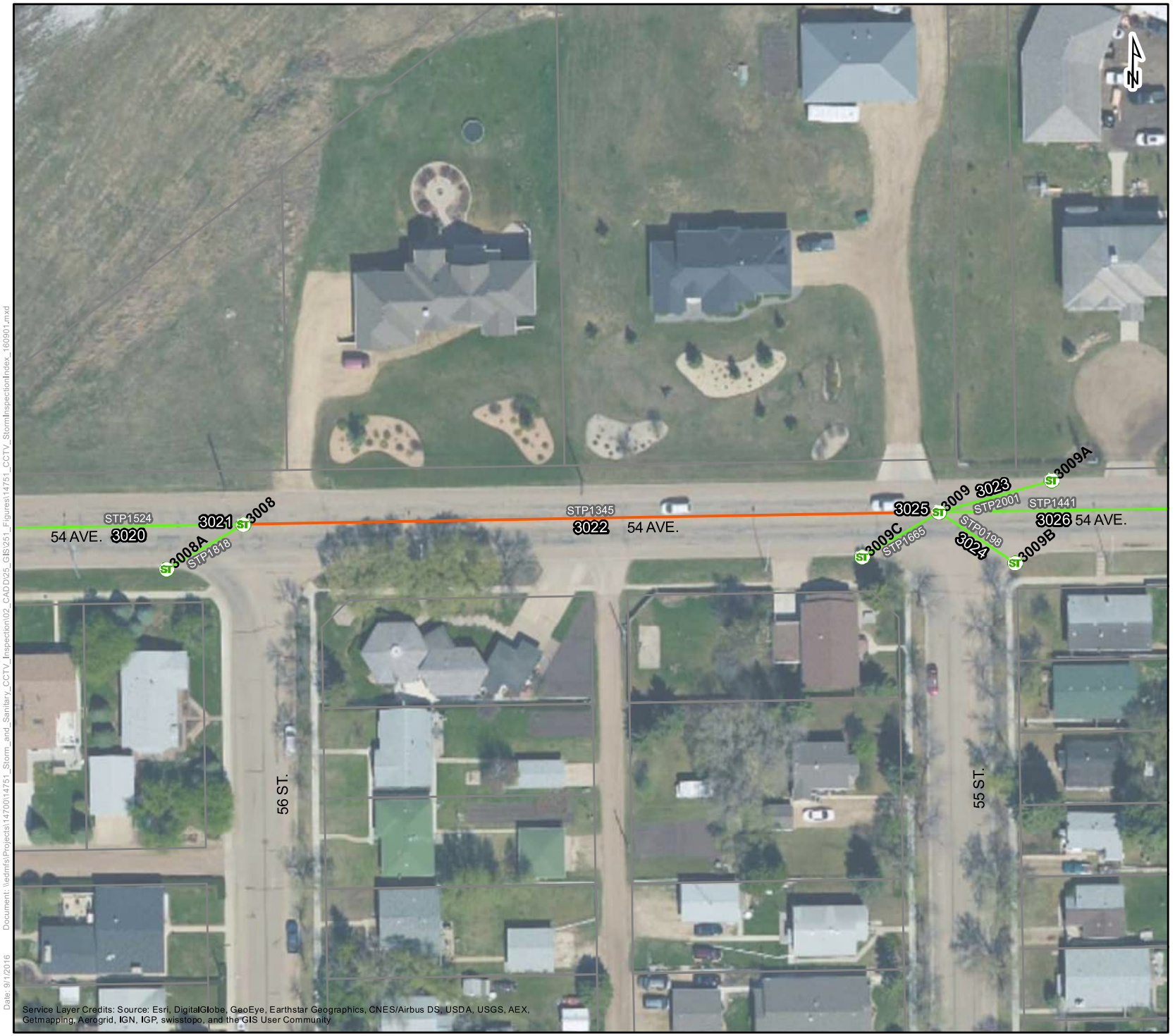
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Storm Pipe
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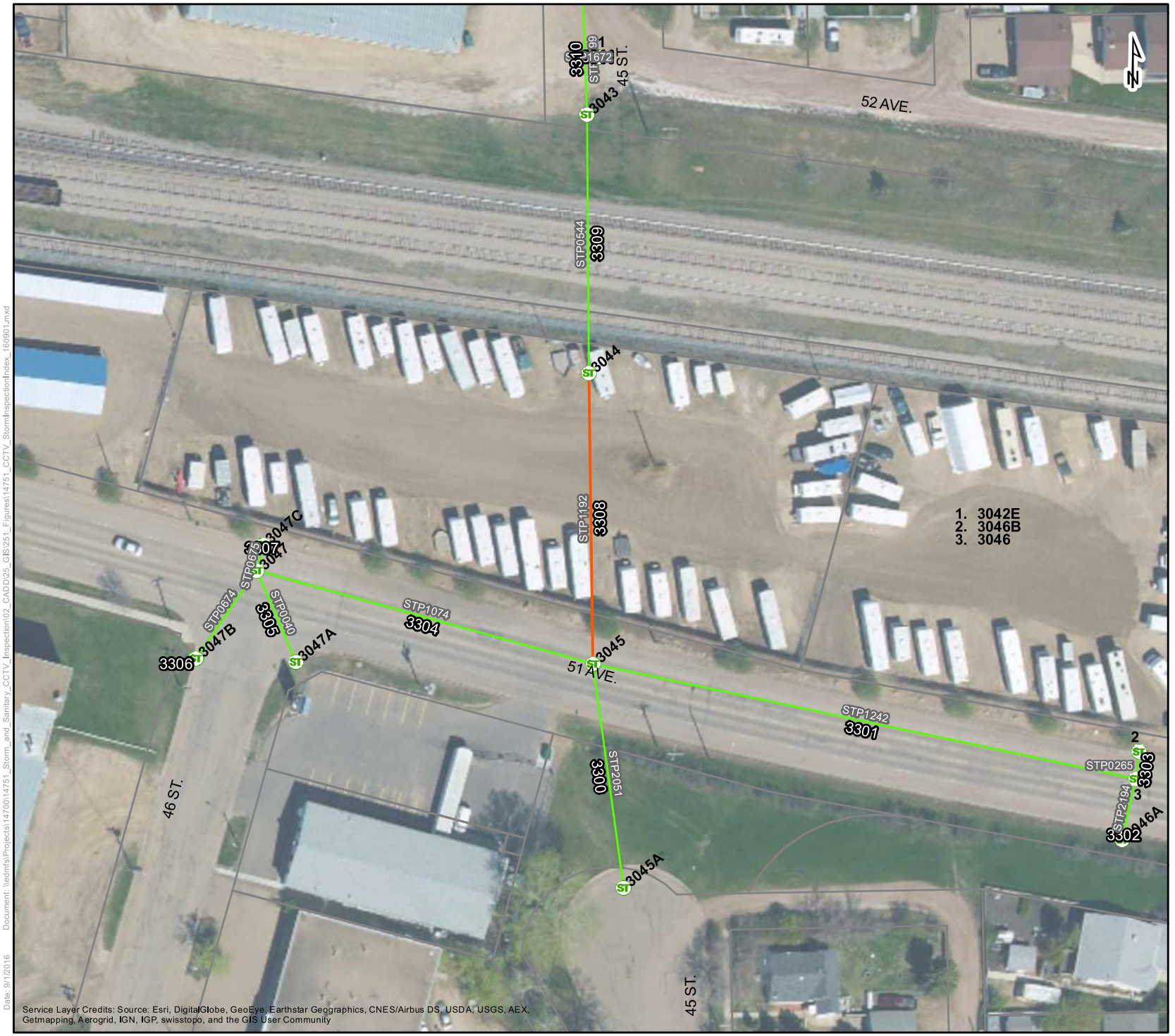
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Legend

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- Storm Pipe
- Storm Pipe: To be inspected

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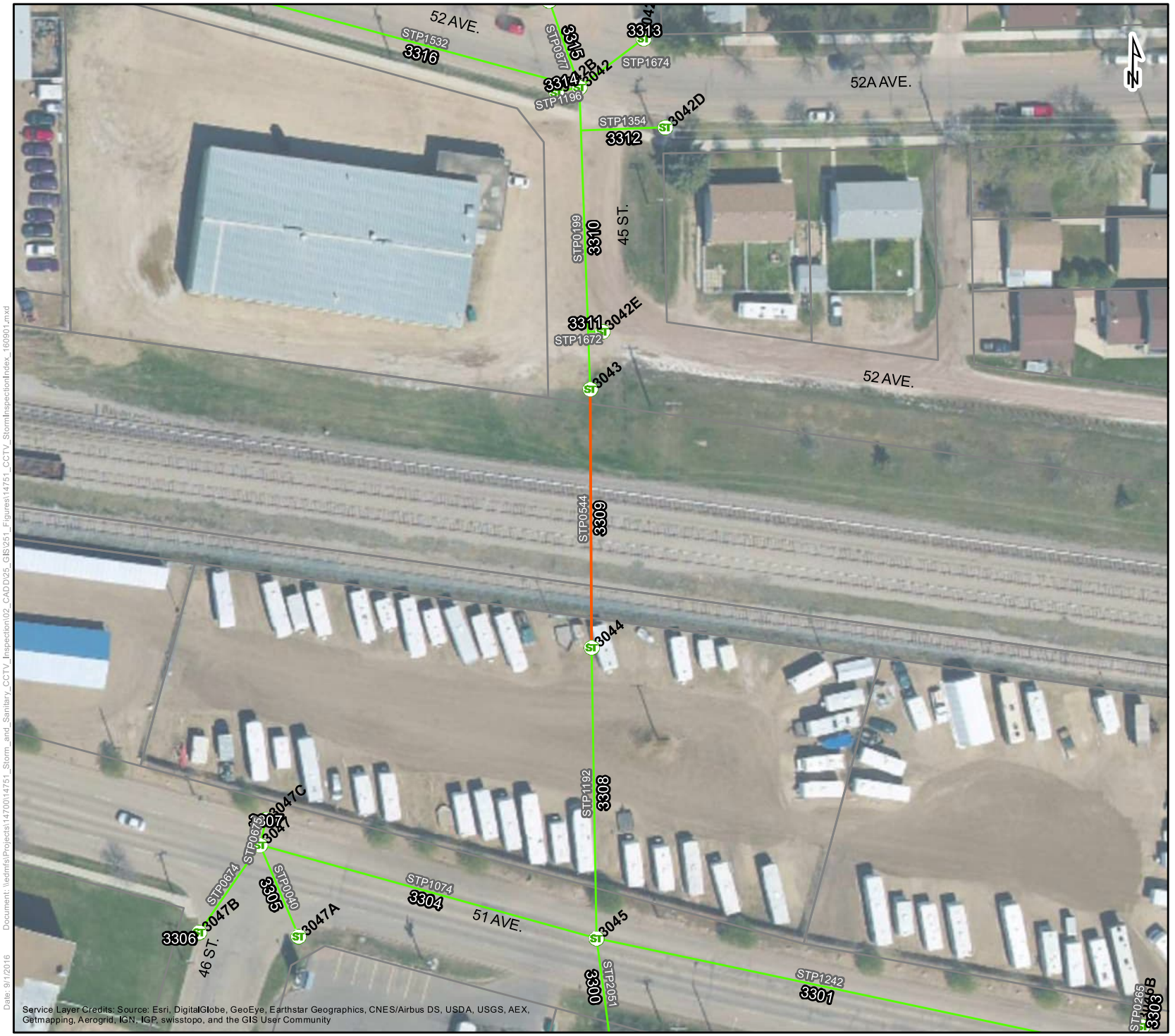
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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

1:900

0 3.7 5 7.5 15 22.5 30 Meters

PIPE ID: 3309
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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Date: 9/1/2016 Document: \\edmfs\Projects\147001\14751_Storm_and_Sanitary_CCTV_Inspection\02_CADD\25_GIS\251_Figures\14751_CCTV_StormInspectionIndex_160901.mxd



Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

1:900

0 3.757.5 15 22.5 30 Meters

PIPE ID: 3310
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

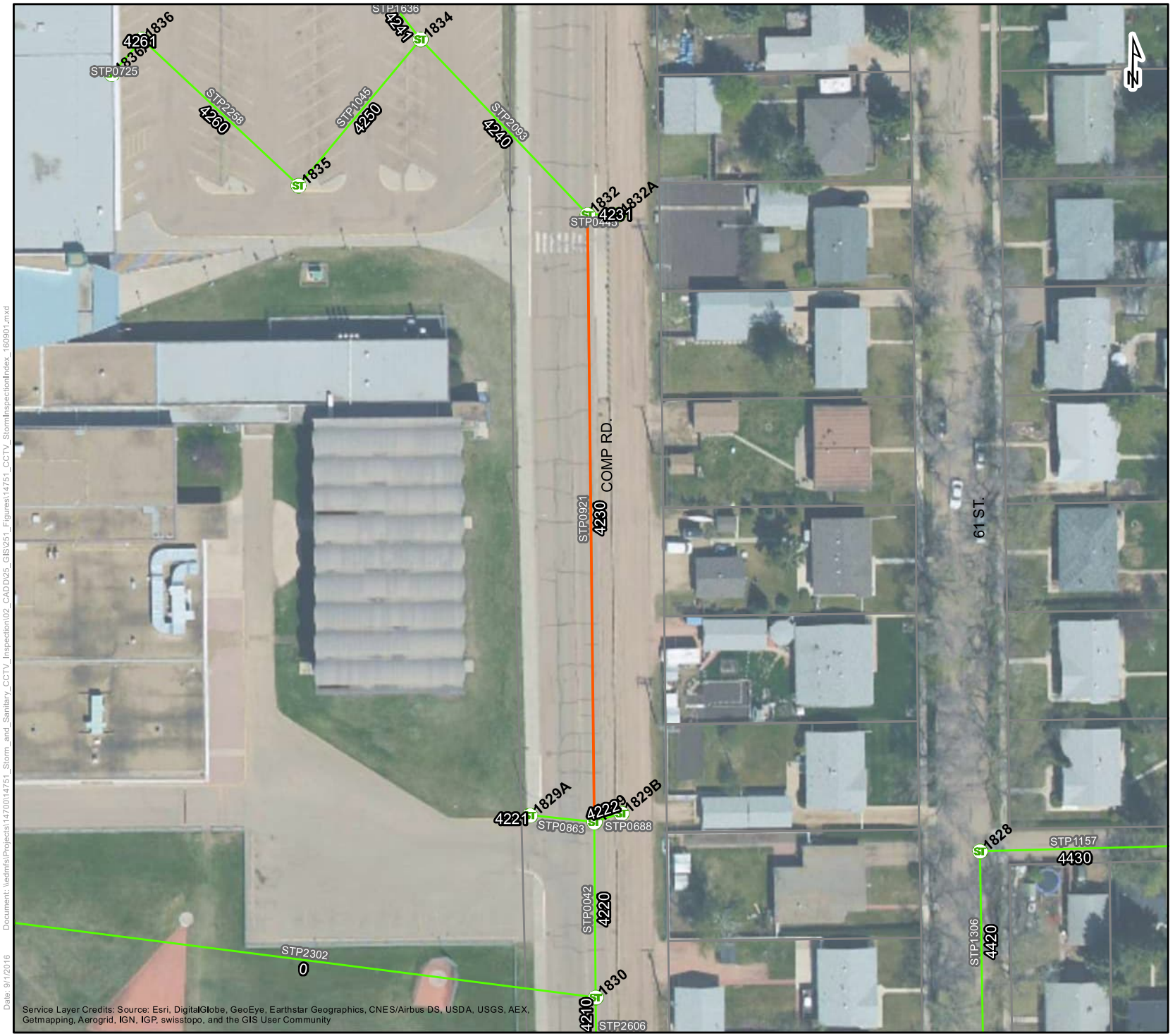
CITY OF Camrose

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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

1:900

0 3.757.5 15 22.5 30 Meters

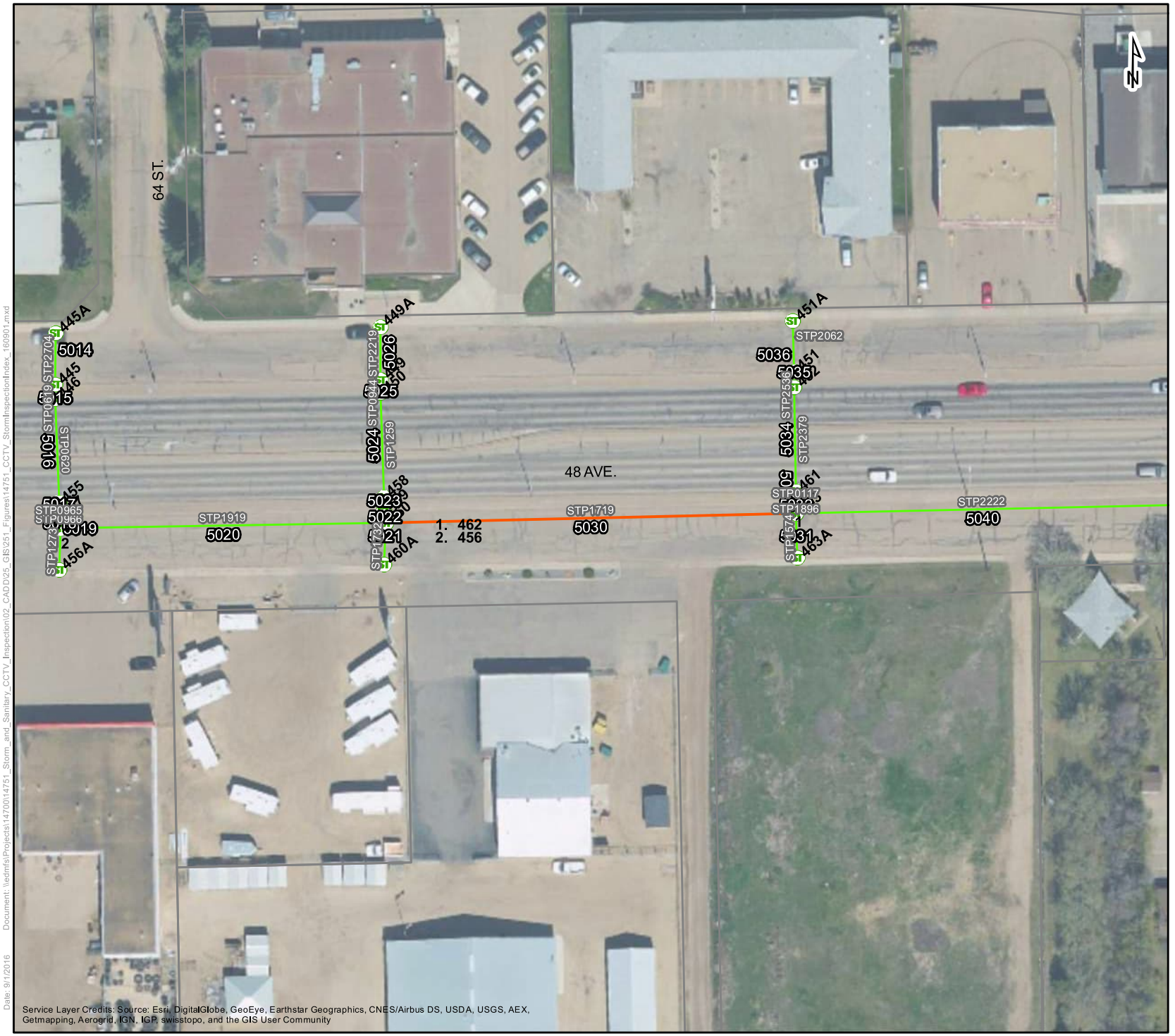
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STORM AND SANITARY
CCTV INSPECTION

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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

1:900

0 3.757.5 15 22.5 30 Meters

PIPE ID: 5030
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Storm Manholes
- Storm Pipe
- Storm Pipe: To be inspected

1:900

0 3.757.5 15 22.5 30 Meters

PIPE ID: 6329
STORM PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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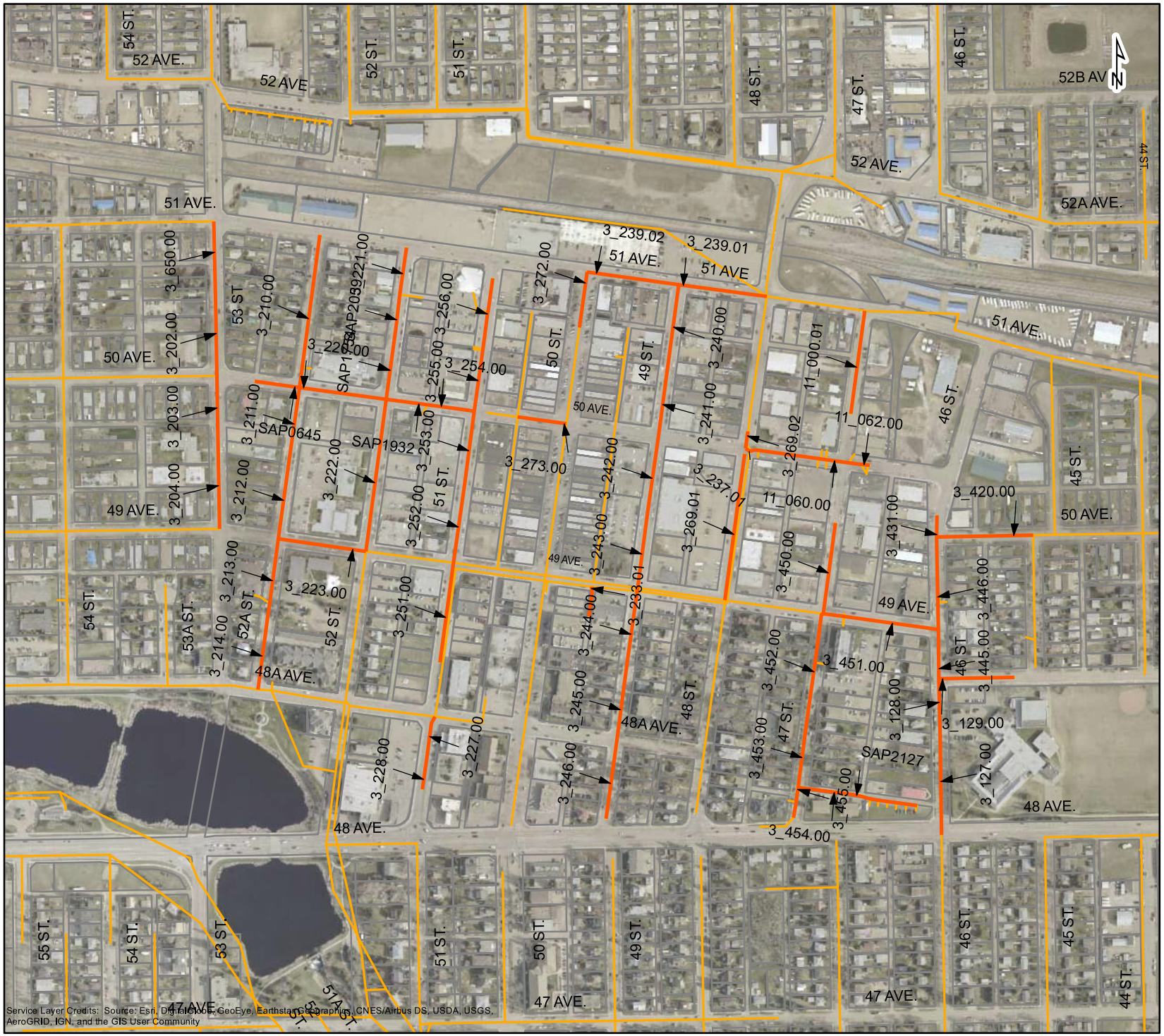
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14751 City of Camrose Storm and Sanitary CCTV Inspections
Phase 2 Storm Sewers

Segment No.	Built in	Location		Properties							CCTV Inspection					Assessment							Preliminary Budget Pricing Based on Nominal Bury Depth 0f (3-4m)									
																											Priority 1		Priority 2		Priority 3	
		Street	Crossroad 1	Pipe ID	Start MH	End MH	Sewer Length m	Avg. Depth m	Pipe Dia.	Pipe Material	Direction	Surveyed Length	% Inspected	Inspection Aborted	Reason Aborted	Struct. Grade	Ops. Grade	Priority	Condition Remarks	Rehabilitation Comments	Flush and Camera	Internal visual culvert inspection	Spot Repair Excavation per m	375mm Spot Repair Liner $ 4,200 each	450mm Spot Repair Liner $ 4,500 each	Minimum Rehabilitation	Recommended Rehabilitation	Minimum Rehabilitation	Recommended Rehabilitation	Minimum Rehabilitation	Recommended Rehabilitation
																					$20.00	$2,500.00	$1,200.00	$4,200.00	$4,500.00						
1	1977	39 Street	Unknown	STP0258	1603	1602	153	3.5	1350	RCP	Down	150	98.0%	No	N/A	1	1	3	Section in sound structural and operational condition . Nothing to note at this time	N/A											
2	1978	PUL	39 Avenue	STP2200 STP 3094	1904	1904 A	92	5.6	1350	CSP	Down	90.9	98.8%	No	N/A	2	1	2	Section starting to exhibit sidewall defections, * Moderate to heavy corrosion	Recommend obtaining measurements to determine Sidewall deflection, *Visually inspect extent of corrosion * Provide report as per AT BIM inspection manual		$2,500.00							$2,500.00	$2,500.00		
3	1978	PUL	39 Avenue	STP2043	1904A	1903	36.5	3.6	1650	CSP	Down	36.1	98.9%	No	N/A	1	1	2	Section starting to exhibit sidewall defections, * Moderate to heavy corrosion	Recommend obtaining measurements to determine Sidewall deflection, *Visually inspect extent of corrosion * Provide report as per AT BIM inspection manual		$2,500.00							$2,500.00	$2,500.00		
4		53 Street	47 Avenue	STP0052	2307	2305	77	1.9	450	RCP	Down	74.8	97.1%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
5	1985	53 Street	46 Avenue	STP0399	2308	2307	99.5	1.9	450	RCP	Down	99.7	100.2%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
6	1982	54 Avenue	60 Street	STP0365	3001	3003	116.5	2.5	525	RCP	Down	116.8	100.3%	No	N/A	2	1	3	Minor longitudinal cracking observed with some staining, no infiltration observed	N/A											
7	1985	53 Street	47 Avenue	STP0052	2307	2305	77	1.8	450	RCP	Down	77	100.0%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
8	1965	54 Avenue	60 Street	STP1345	3009	3008	117.5	2.8	900	RCP	Down	118	100.4%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
9	1968	45 Street	52 Avenue	STP0199	3043	3042	51	2	450	RCP	Down	50.7	99.4%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
10	1968	Storage Yard	45 street	STP0544	3043	3044	44	2.5	450	RCP	Down	42.6	96.8%	No	N/A	1	2	3	Many settled deposits in this section suggesting sag and back graded pipe locations	Maintain a current and progressive flushing/maintenance program between MH 3044 and 3043 to remove gravel and debris build up. *Ensure catch basin sumps upstream are maintained to reduce debris from entering the storm system.	$880.00								$880.00	$880.00	
11	1968	51 Avenue	46 street	STP1192	3045	3044	49	2.3	450	RCP	Down	5.2	10.6%	Yes	N/A	2	2	2	Protruding CB lead at 4.6m downstream MH 3045. No mortar at joint and large circumferential crack in lead. 3044 Inaccessible. Located in trailer storage yard.	Place CIPP spot liner <3m at 3m to 6m downstream of MH 3045 * Clean CB sump of debris					$4,500.00			$4,500.00	$4,500.00		
12	1978	50 Street	50 Avenue	STP0404	4027	4089	169.5	3.8	1050	RCP	Down	169.5	100.0%	No	N/A	1	1	3	No structural or operational concerns observed	N/A											
13	1974	Marler Drive	Mount Pleasant Dr.	STP1809	1912	1911	167	2.7	1350	CSP	Down	167.5	100.3%	No	N/A	2	2	2	Section starting to exhibit minor sidewall defections, *Separation of circumferential seams apparent, * Some debris accumulation, * Moderate to heavy corrosion	Recommend obtaining measurements to determine Sidewall deflection * Further inspected open joint locations, * Visually inspect extent of corrosion * Provide report as per AT BIM inspection manual		$2,500.00							$2,500.00	$2,500.00		
14	1974	Marler Drive	59 Street	STP1234	1911	1910	167	2.7	1350	CSP	Down	166.6	99.8%	No	N/A	2	2	2	Section starting to exhibit minor sidewall defections, *Separation of circumferential seams apparent, * Perforation in sidewall, * Some debris accumulation, * Moderate to heavy corrosion,* Gas main protruding through sidewall	Recommend obtaining measurements to determine Sidewall deflection * Further inspect open joint locations, Seal perforation , Contact local natural gas utility, * Visually inspect extent of corrosion * Provide report as per AT BIM inspection manual		$2,500.00							$2,500.00	$2,500.00		
15	1994	Comp Road	Comp Road	STP0921	1832	1829	103	Unknown	375	RCP	Down	103	100.0%	No	N/A	5	2	1	Sewer has poor vertical alignment with varied joint offsets, and sections of broken pipe. Note : Pipe full of debris prior to cleaning	Excavate and replace sewer from MH 1832 to 4.8 m downstream * Apply <2m CIPP spot reline from 98 to 100m downstream of MH 1832 * Note : Ensure upstream catch basin sumps are cleaned regularly			$8,400.00	$4,200.00		$12,600.00	$12,600.00				
16	1976	73 Street	Marler Drive	STP1350	1717	1718	91	2.2	675	RCP	Down	90.3	99.2%	No	N/A	1	2	3	Section in sound structural and operational condition . Nothing to note at this time	Maintain a current and progressive flushing/maintenance program of storm sewer between MH 1718 and 1719 to remove gravel and debris build up. *Ensure catch basin sumps upstream are maintained to reduce debris from entering the storm system.	$1,820.00								$1,820.00	$1,820.00
																				Subtotal						**$12,600.00**	**$12,600.00**	**$14,500.00**	**$14,500.00**	**$2,700.00**	**$2,700.00**

APPENDIX C

Phase 3 Sanitary Inspections
– Maps and Condition Assessments



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Legend

- Sanitary Pipes To be Inspected
- Sanitary Pipe

1:6,000

0 25 50 100 150 200 Meters

KEY PLAN
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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ISL Engineering and Land Services



Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: SAP0645
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

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- Sanitary Manhole
- Sanitary Pipe

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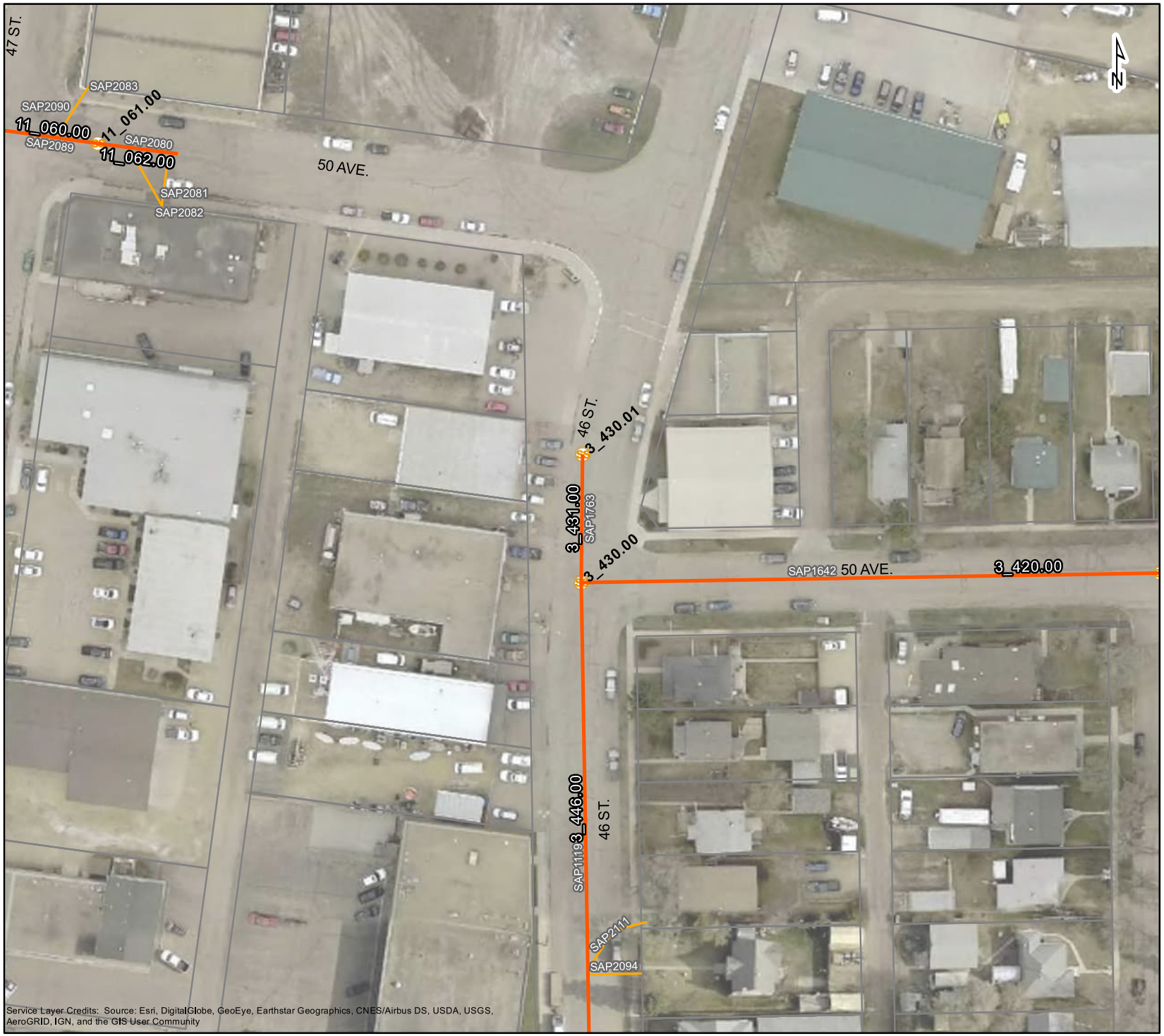
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STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

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PIPE ID: 3_431.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

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PIPE ID: 3_272.00
SANITARY PIPE INDEX
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CCTV INSPECTION

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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 11_062.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

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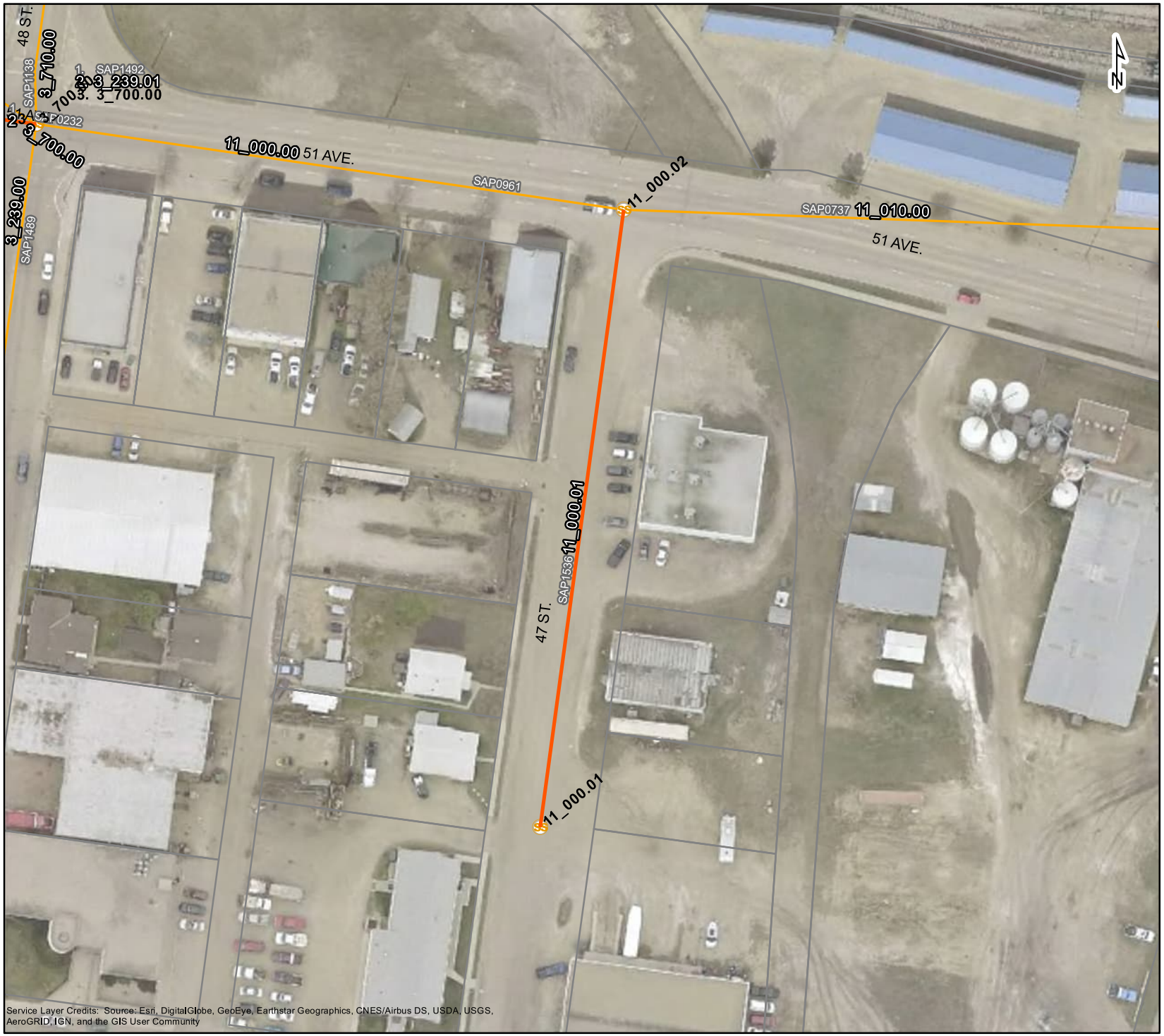
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

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STORM AND SANITARY
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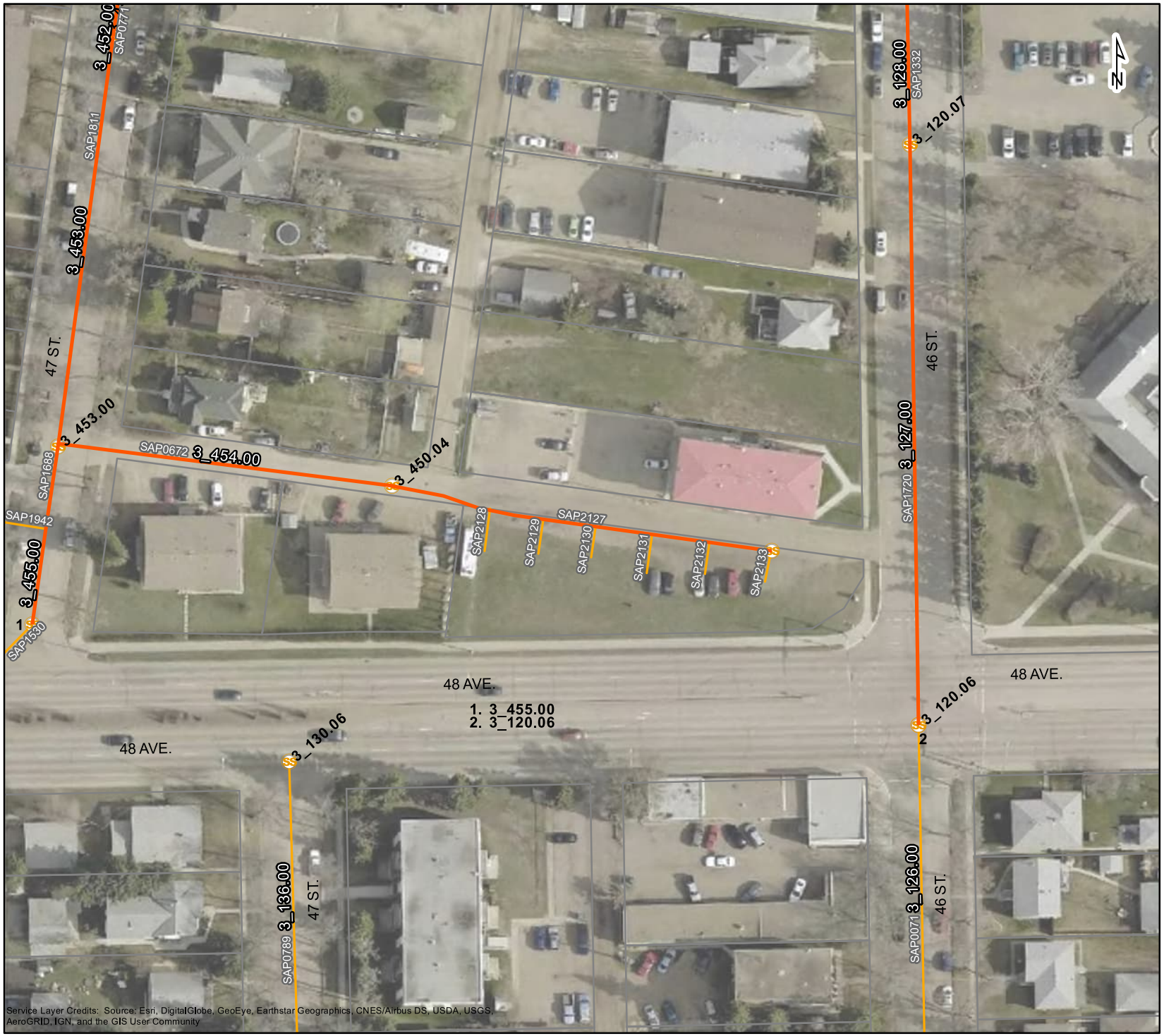
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Legend

- Sanitary Pipes To be Inspected
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- Sanitary Pipe

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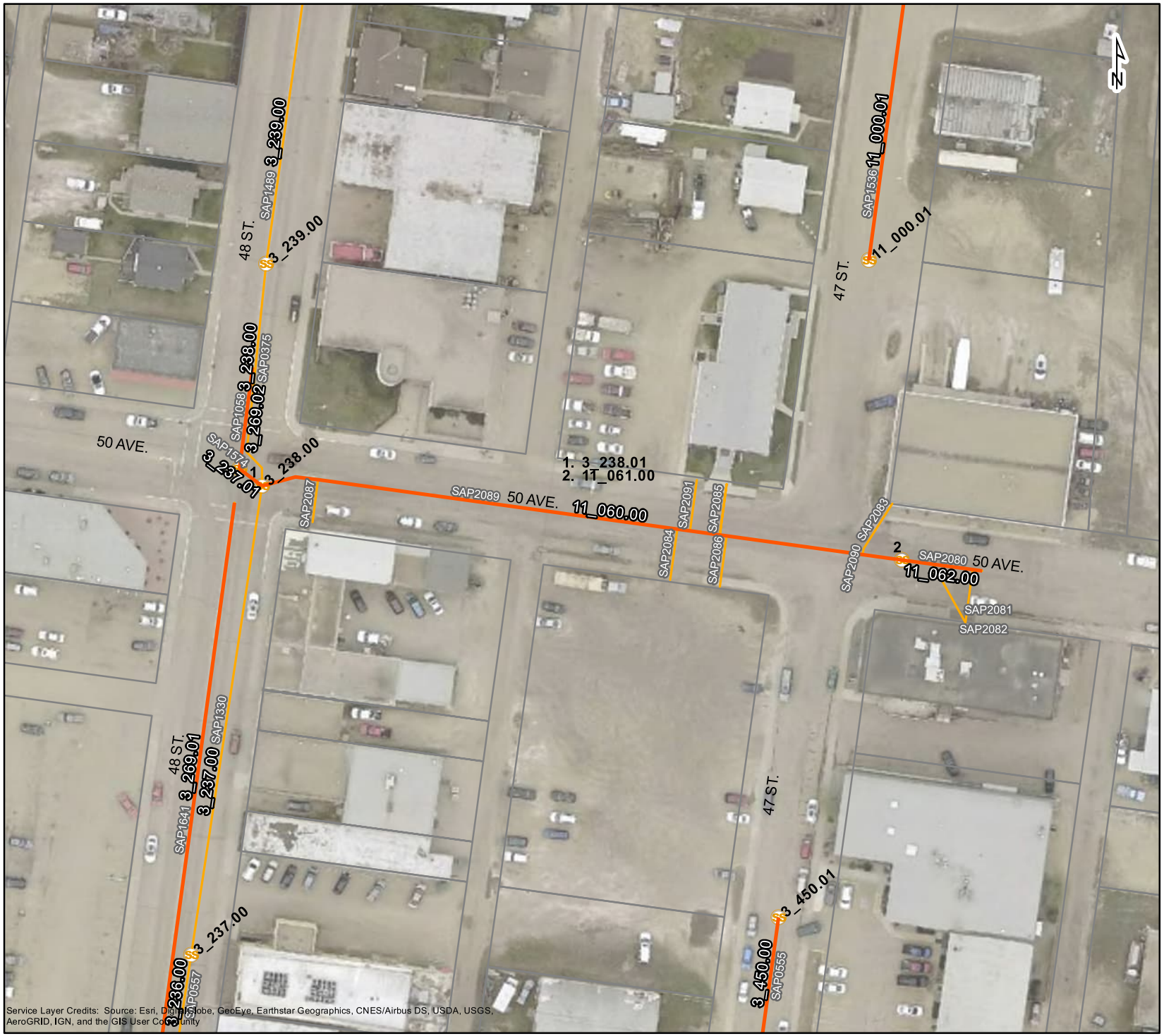
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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

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PIPE ID: 11_060.00
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: SAP1754
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_128.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

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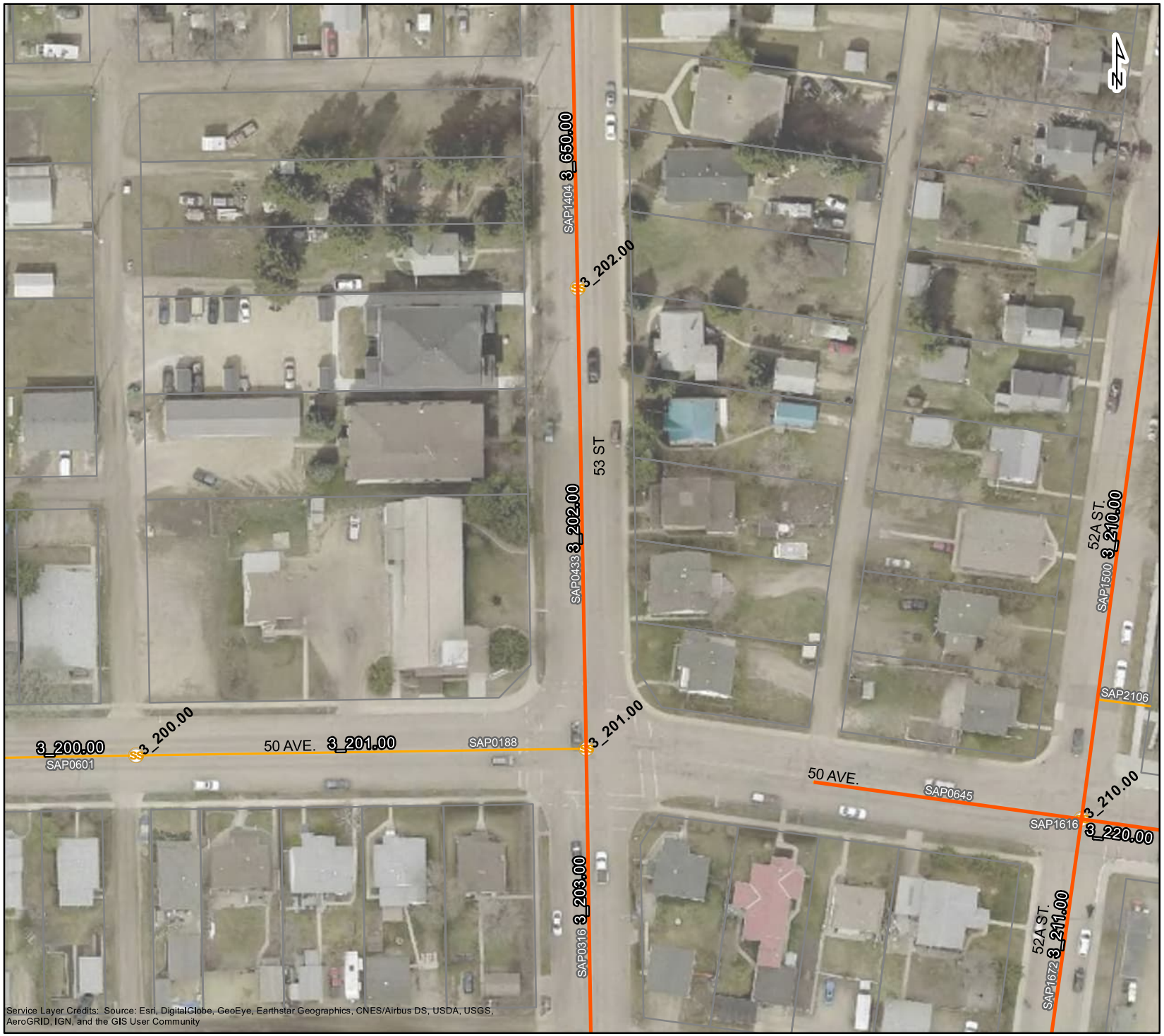
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_202.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_203.00
SANITARY PIPE INDEX
STORM AND SANITARY
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CITY OF Camrose

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_204.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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ISL Engineering and Land Services

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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_210.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_246.00
SANITARY PIPE INDEX
STORM AND SANITARY
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CITY OF Camrose

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Legend

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- Sanitary Pipe

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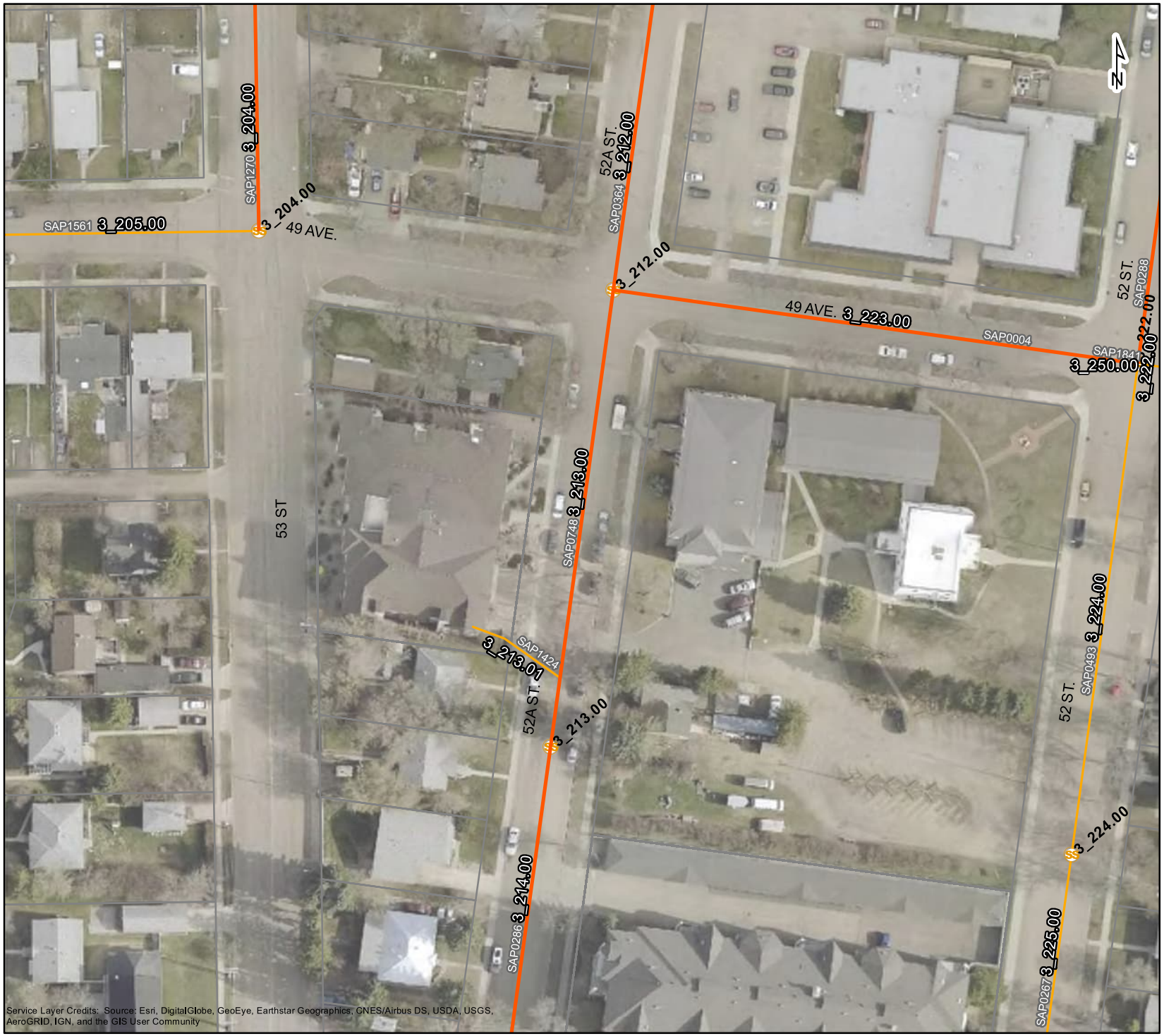
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_213.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_214.00
SANITARY PIPE INDEX
STORM AND SANITARY
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CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

Date: 2018-11-15 Document: J:\14700\14751_Storm_and_Sanitary_CCTV_Inspection\02_CADD\25_GIS\251_Figures\CCTV Phase 3 STM & SAN\14751_1_46st_48-49ave.mxd



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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_269.01
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS Inc.

ISL Engineering and Land Services



Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_221.00
SANITARY PIPE INDEX
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_222.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_223.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_227.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_228.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_233.01
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_445.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_239.01
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_239.02
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
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- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_240.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_241.00
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STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_242.00
SANITARY PIPE INDEX
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Legend

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- Sanitary Manhole
- Sanitary Pipe

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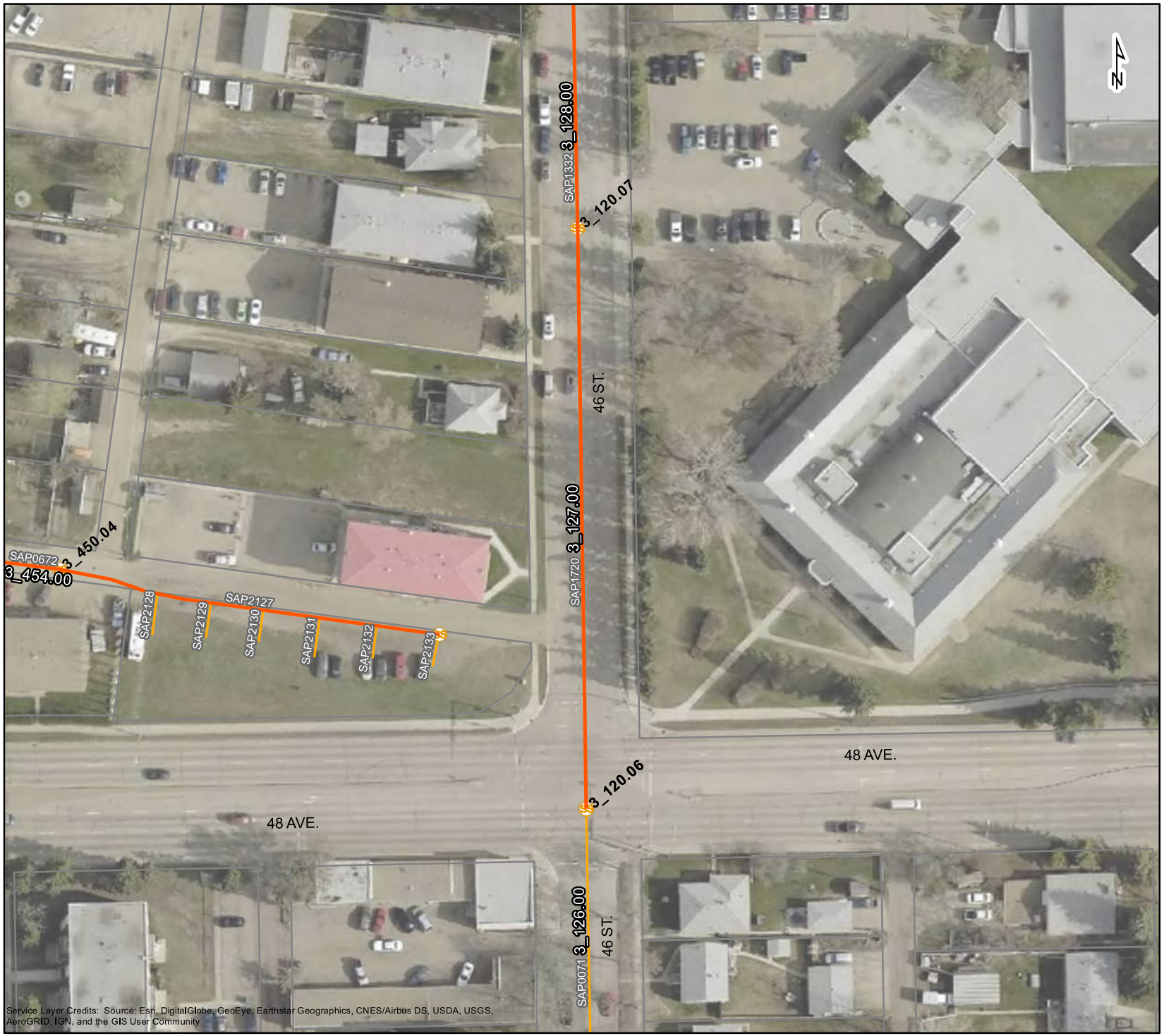
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STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
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- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_127.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
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- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_245.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_455.00
SANITARY PIPE INDEX
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

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- Sanitary Manhole
- Sanitary Pipe

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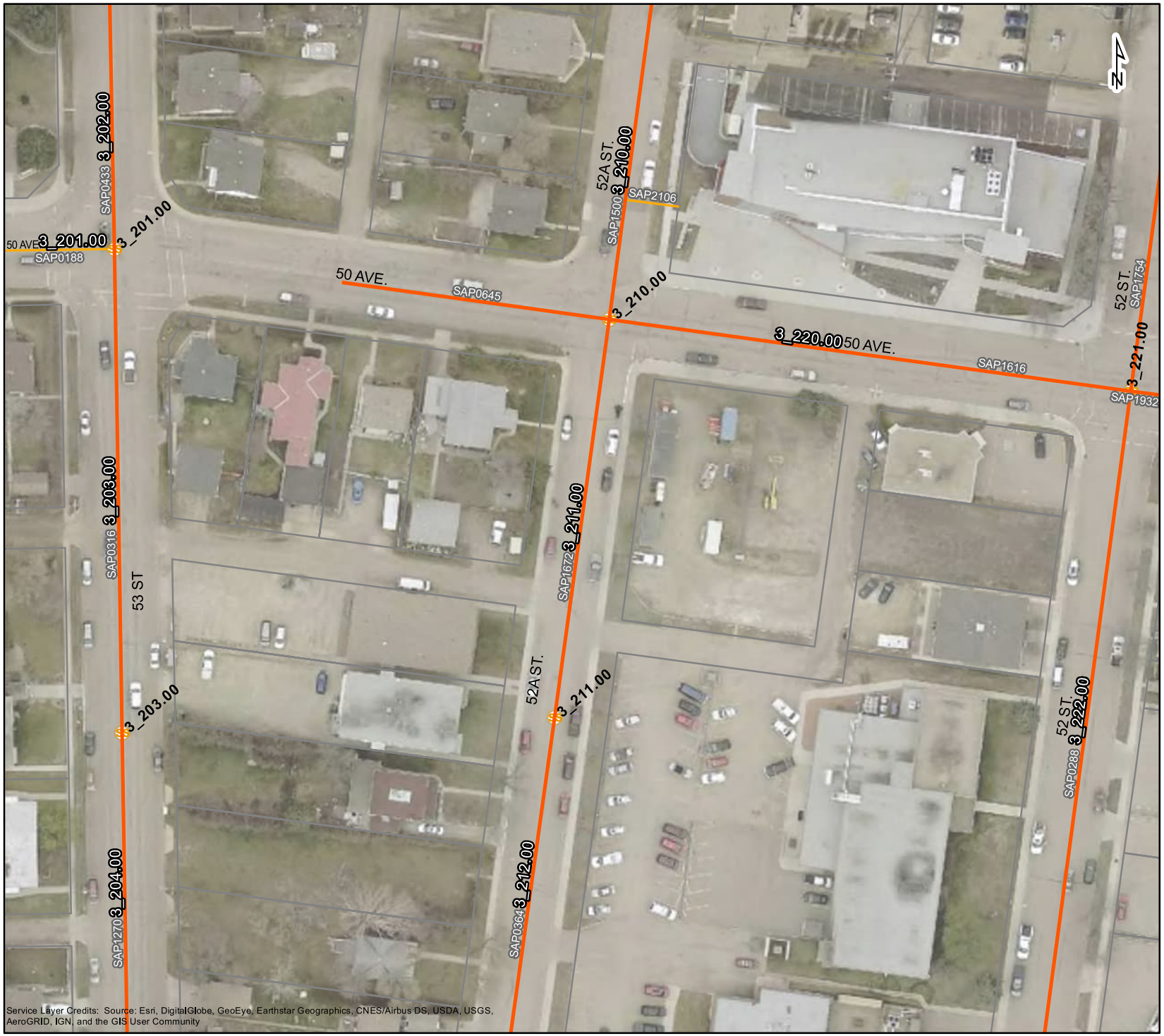
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_211.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_253.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_254.00
SANITARY PIPE INDEX
STORM AND SANITARY
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- Sanitary Pipe

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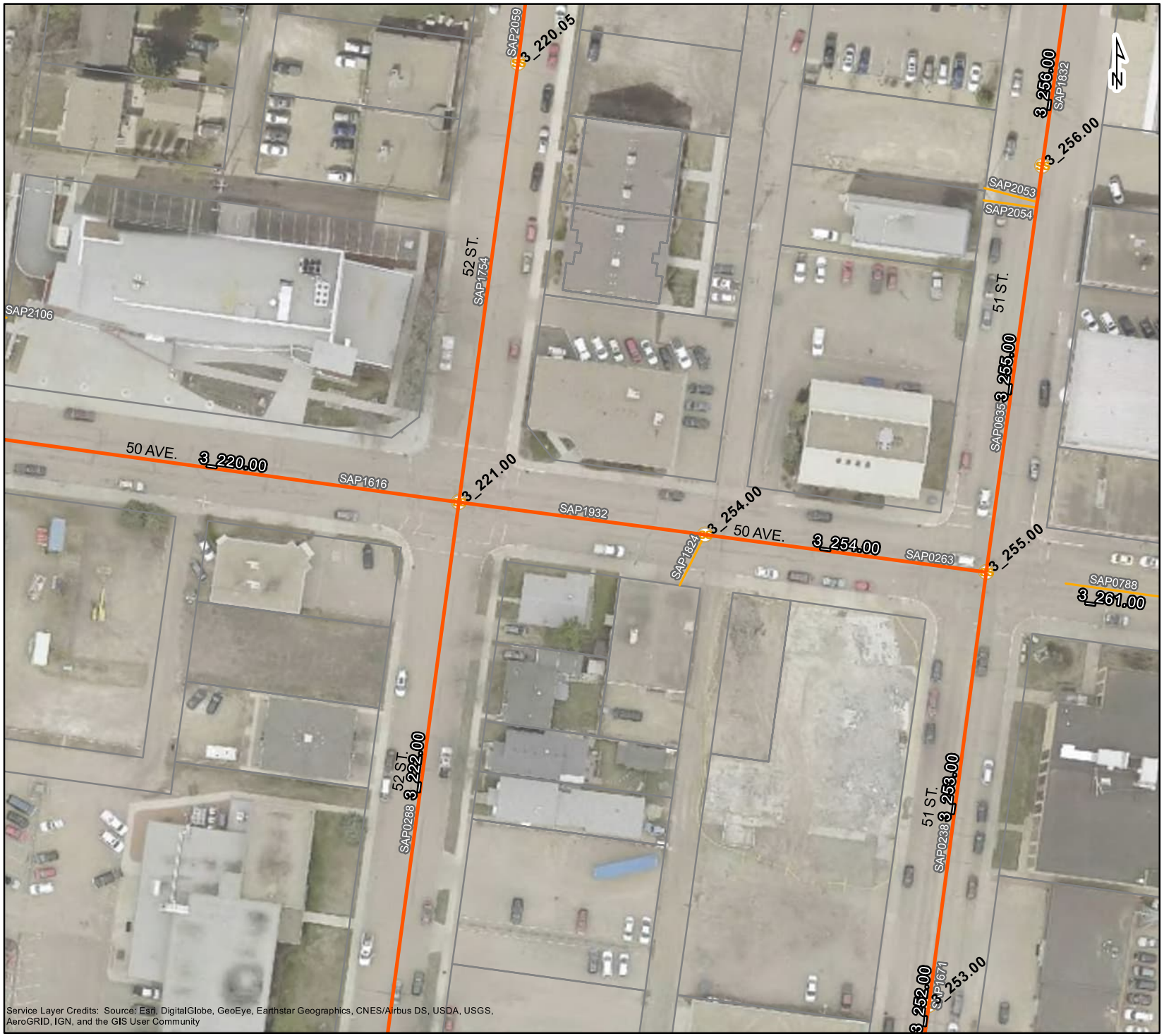
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SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

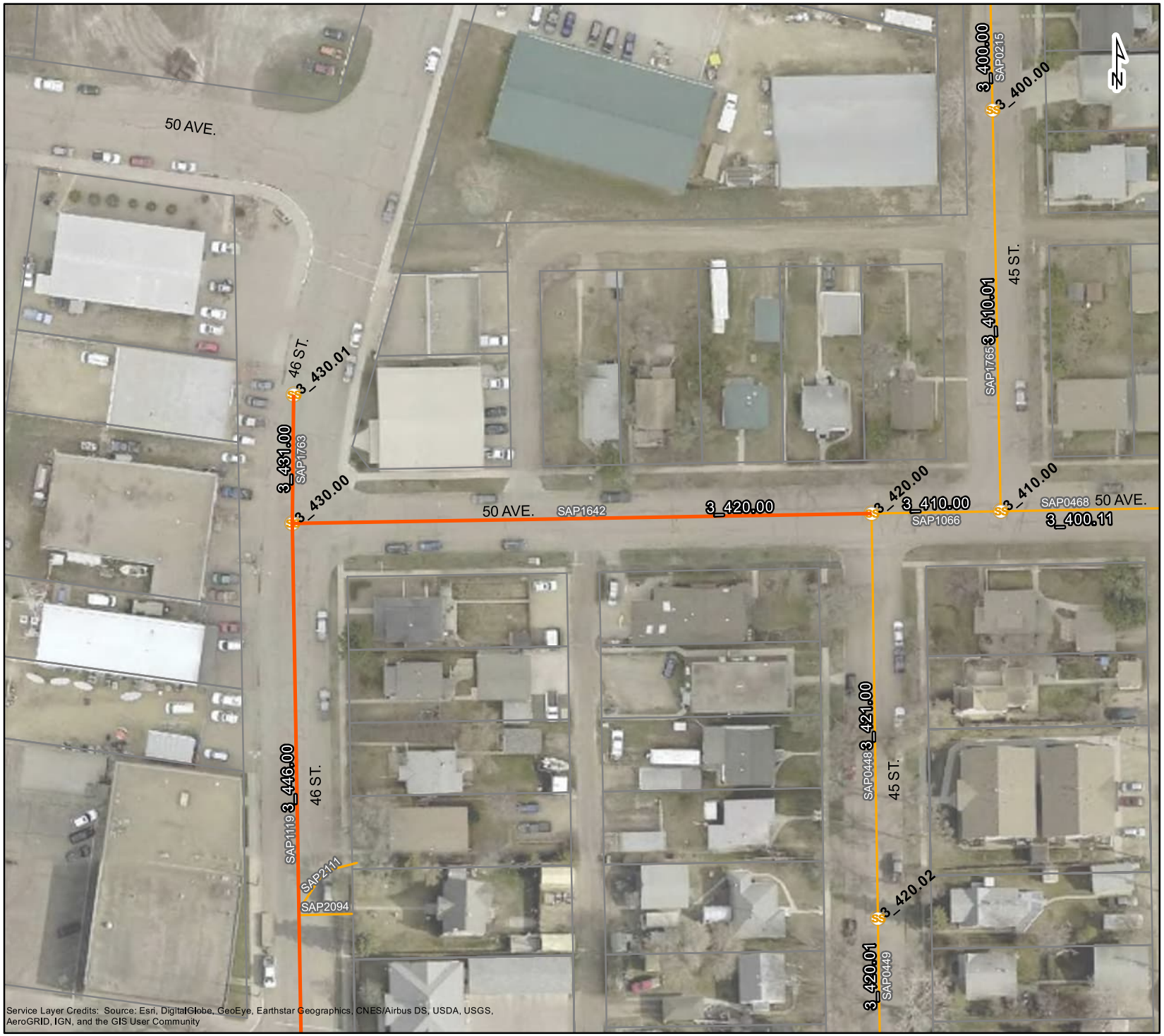
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_420.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_269.02
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

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- Sanitary Manhole
- Sanitary Pipe

1:1,000

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PIPE ID: SAP2059
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_273.00
SANITARY PIPE INDEX
STORM AND SANITARY
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

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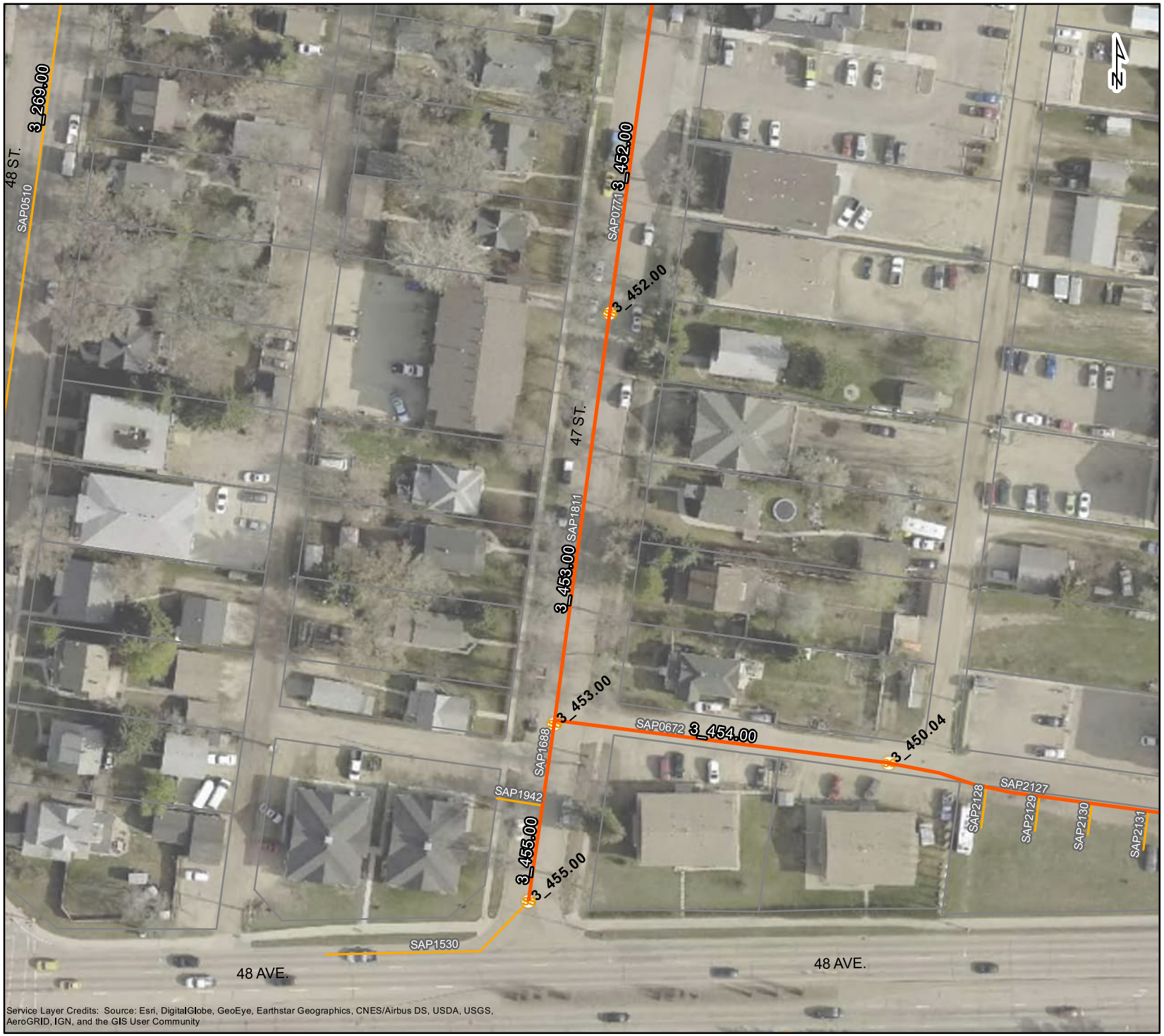
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SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_453.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_220.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_446.00
SANITARY PIPE INDEX
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Legend

- Sanitary Pipes To be Inspected
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- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_450.00
SANITARY PIPE INDEX
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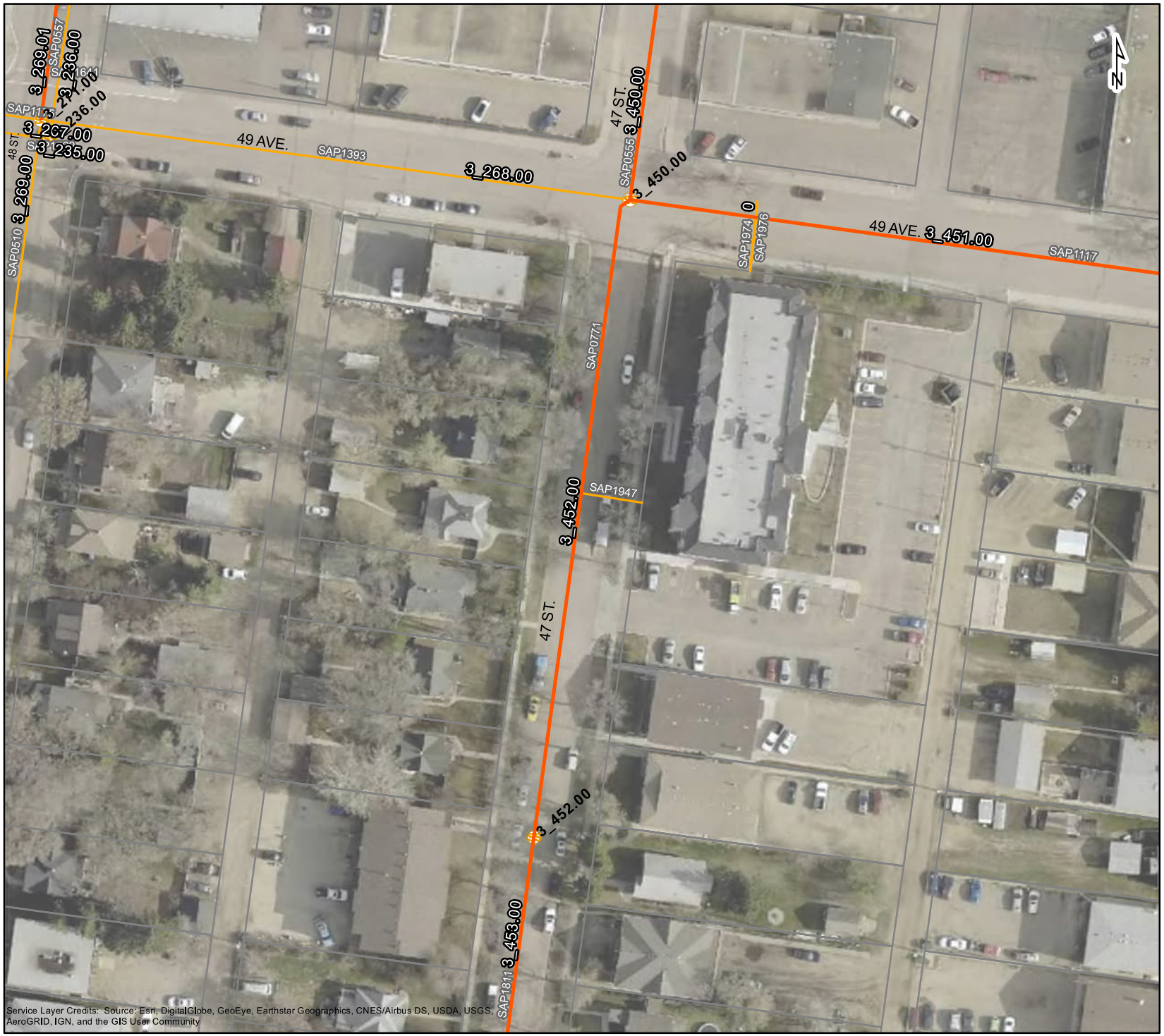
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_452.00
SANITARY PIPE INDEX
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Legend

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- Sanitary Pipe

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PIPE ID: 3_256.00
SANITARY PIPE INDEX
STORM AND SANITARY
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- Sanitary Pipe

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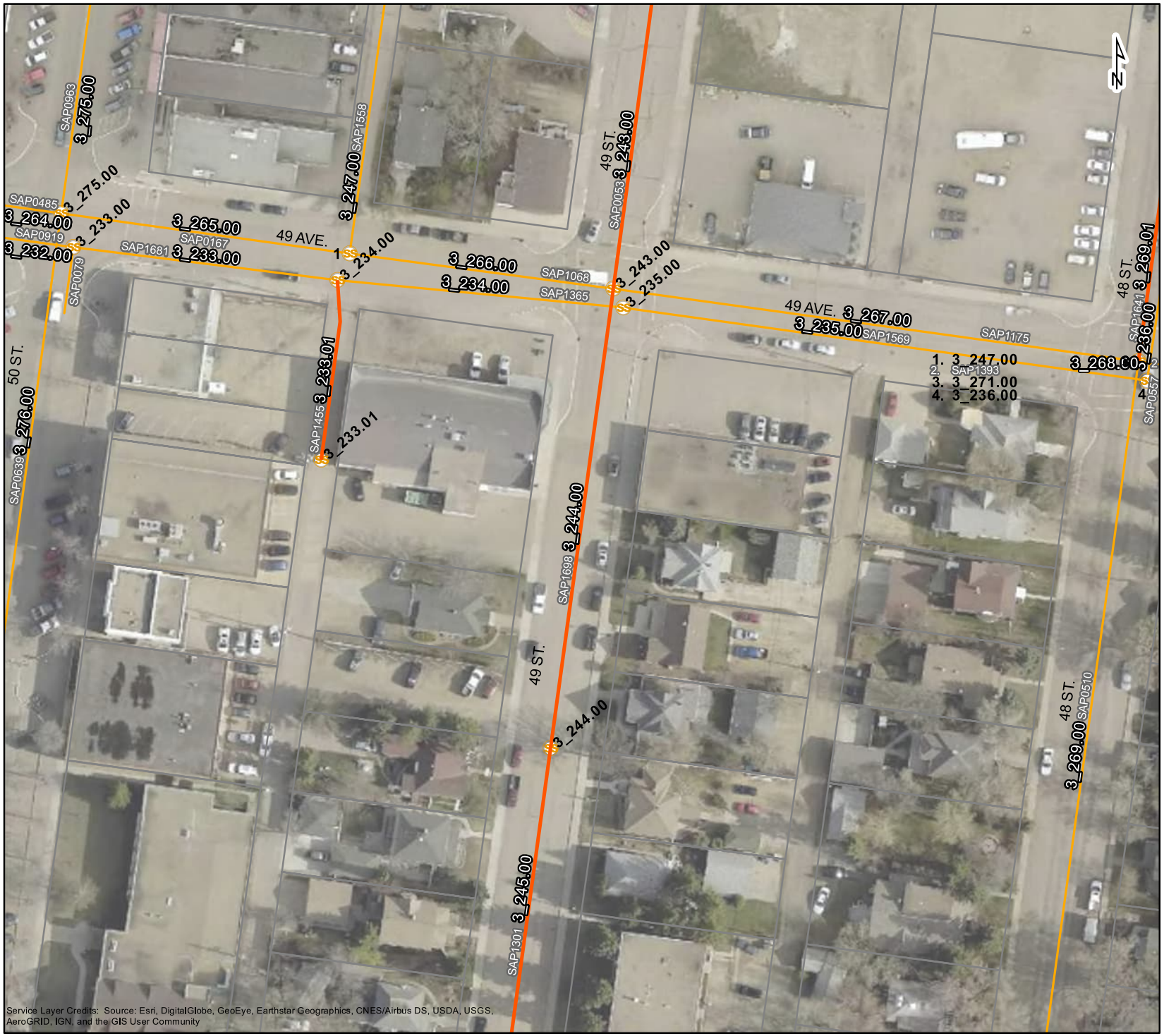
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Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

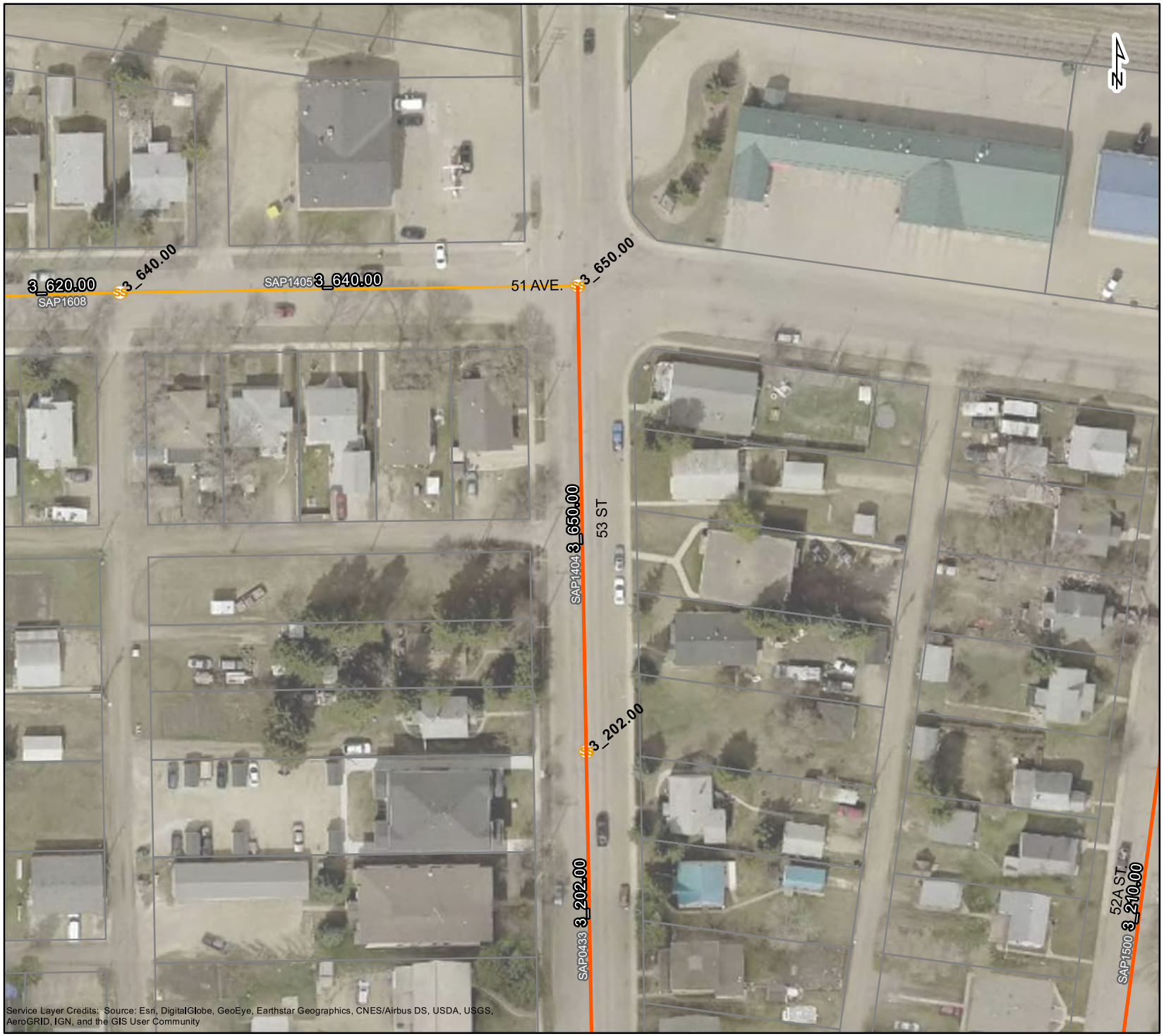
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SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

Date: 2018-11-15 Document: J:\14700\14751_Storm_and_Sanitary_CCTV_Inspection\02_CADD\25_GIS\251_Figures\CCTV Phase 3 STM & SAN\14751_1_46st_48-49ave.mxd



Legend

- Sanitary Pipes To be Inspected
- Sanitary Manhole
- Sanitary Pipe

1:1,000

0 4.25 8.5 17 25.5 34 Meters

PIPE ID: 3_650.00
SANITARY PIPE INDEX
STORM AND SANITARY
CCTV INSPECTION

CITY OF Camrose

IVIS inc.

ISL Engineering and Land Services

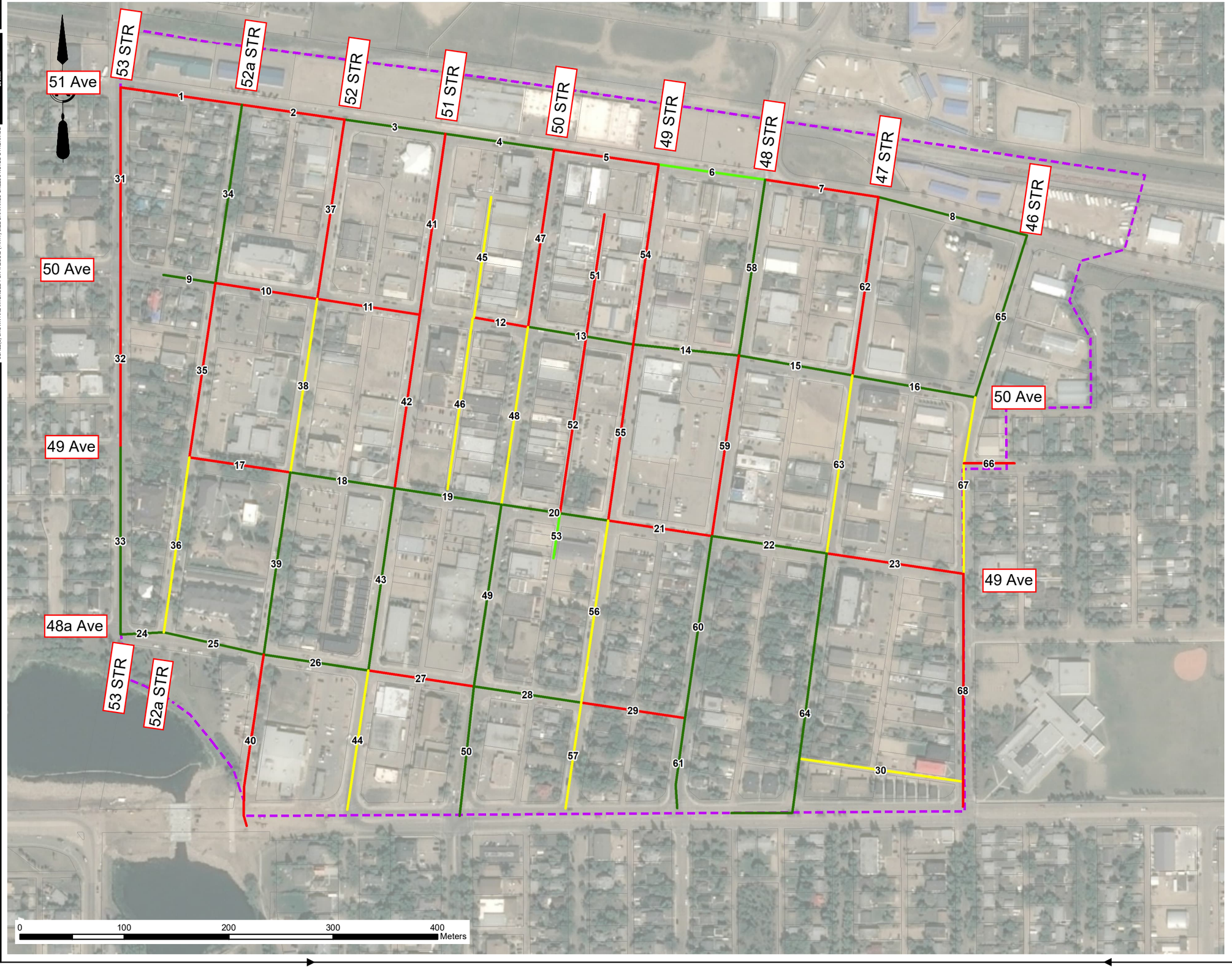
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14791 City of Camrose Storm and Sanitary CCTV Inspections 2019
Phase 3 Sanitary Sewers

Segment No.	Location		Properties						CCTV Inspection					Assessment			Preliminary Budget Prices Based on Nominal Runs (Lengths of Pipe)											
	Street	Crossroad 1	Pipe ID	Start MH	End MH	Sewer Length m	Avg. Depth m	Pipe Dia.	Pipe Material	Direction	Surveyed Length	% Inspected	Inspection Aborted	Reason Aborted	Struct. Grade	Ops. Grade	Priority	Condition Remarks	Rehabilitation Comments	Flush and Camera $ 30 per m $ 90.00	300 mm Spot Repair Excavation $ 3600 per m $1,800.00	300 mm Full Length Remove and Replace Excavation $/ 900.00	250 mm CIPP Spot Repair Liner <3m $ 5,000 each $2,500.00	250 mm CIPP Spot Repair Liner >7m $ 7,000 each $7,000.00	250 mm CIPP Spot Repair Liner Random Lengths >3m $600.00	1200mm Manhole Installation $ 3,000 per m $1,500.00	Alternitive Existing Sewer $40 per m $20.00	Priority 1 Minimum Rehabilitation Option 1	Priority 1 Recommended Rehabilitation Option 2	Priority 2 Minimum Rehabilitation Option 1	Priority 2 Recommended Rehabilitation Option 2	Priority 3 Minimum Rehabilitation Option 1	Priority 3 Recommended Rehabilitation Option 3
1	53 Street	51 Avenue	SAP 0433	3_202.00	3_201.00	86.3	2.45	200	VCP	Down	86.3	100%	No	N/A	2	3	2	Segment has varied vertical alignment with multiple sag locations, loss of CSA ranging from 20% to 80%. Broken pipe (moderate) at service tap on 5:00 m downstream of MH 3_202	CIPP Spot Repair of service connection <1m, 59 to 60 m downstream of MH3_202				$5,000.00							$5,000.00	
2	53 Street	50 Avenue	SAP 1270	3_203.00	3_204.00	82	2.2	200	VCP	Down	80.5	98%	Yes	Dropshaft Pipe	2	2	2	Segment in fair structural condition with two locations (moderate) circumferential cracks. Operational capacity is also fair. Survey abandon due to dropshaft pipe at 80.5m	CIPP Spot Repairs (2 service connection <1m, 12.5 to 13.5m, broken pipe <1m 69.5 to 70.5m downstream of MH 3_203				$10,000.00							$10,000.00	
2a	53 Street	49 Avenue	SAP 1270	3_204.00	3_203.00		2.2	200	VCP	Up	1.5	2%	Yes	Dropshaft Pipe				Evaluation incomplete, insufficient CCTV to review **(Reverse Run)**	NA													
3	52 A Street	51 Avenue	SAP 1500	3_209.00	3_210.00	173	2.55	200	VCP	Down	171.5	99%	No	N/A	2	2	3	Poor CCTV quality because camera needed to be pulled through segment, due to length between manholes. Multiple intruding service connections, with some minor circumferential cracks. Poor characteristics, severely fractured	None at this time													
4	52 A street	49 Avenue	SAP 0748	3_212.00	3_213.00	86.1	2.3	200	VCP	Down	86.1	100.0%	No	N/A	3	2	2	Segment exhibits surface spalling and blistering, with a series of minor to moderate spiral and longitudinal cracks, and minor root propagation throughout its length. Service taps are generally					$5,000.00		$7,200.00					$12,200.00	
5	49 Avenue	52 A Street	SAP 0804	3_212.00	3_322.00	99	3.05	200	VCP	Down	98.8	99.8%	No	N/A	4	3	1	Minor to Moderate circumferential and longitudinal cracks and fractures throughout segment. Minor root propagation is also evident at pipe joints and service tap ins. Low velocity segments	Full Length Liner						$40,000.00					$40,000.00	
6	52 A Street	48 A Avenue	SAP 0288	3_213.00	3_215.00	84.9	2.5	200	VCP	Down	84.9	100.0%	No	N/A	3	2	2	Segment has varied vertical alignment and horizontal alignment with minor encrustation deposits. Minor to moderate cracks are evident throughout the run, deferential settlement at material change from PVC to VCP has fractured existing sewer	CIPP Spot Repairs (2) <3m 1.1 to 3.3m, and >2m 81.3 to 82.3m downstream of MH3_213				$10,000.00							$10,000.00	
7	52 Street	51 Avenue	SAP 0315	3_220.00	3_221.00	82.3	2.5	200	VCP	Down	82.3	100.0%	No	N/A	5	4	1	Segment has multiple collapses and badly fractured sections of sewer. Very poor vertical and horizontal alignment evident has led to multiple sags with grease and mineral attached deposits	Full length replacement of existing sewer with new SDR-35 PVC. Reconnect existing service laterals			$102,600.00						$102,600.00			
8	52 Street	50 Avenue	SAP 0288	3_222.00	3_221.00	172.7	2.7	200	VCP	Down	150.9	87.4%	Yes	Intruding Service	3	2	2	Minor to Moderate circumferential and longitudinal cracks and fractures throughout segment. Four main areas of concern which require CIPP Spot Repairs. If budget allows consider full length liner: Spot Repairs 2+20 to 3+33m, 39 to 42m, 76.5 to 87m, 153 to 158m downstream of MH3_222 . Note: No Manhole access within 150m	**Option 1.** CIPP Spot Repairs (4)<4m 28.5 to 30.5m, <3m 39 to 42m, <11m 76.5 to 87m, and <4m 153 to 158 m downstream of MH 3_222. **Option 2.** Full Length Liner with installation of Manhole at mid point of MH3_222		$5,000.00	$15,000.00	$8,800.00	$69,200.00	$10,500.00				$99,800.00	$79,700.00		
8a	52 Street	50 Avenue	SAP 0288	3_221.00	3_222.00		2.7	200	VCP	Up	21.8	1.3%	Yes	Intruding Service	2	2	2	Varying vertical alignment **(Reverse Run)** for above segment	Recommendation as above												
9	51 Street	49 Avenue	SAP 1510	3_238.00	3_237.00	32	3.5	200	VCP	Down	32	100.0%	No	N/A	2	2	2	Varying vertical and horizontal alignment. Minor fracture, susceptible to	CIPP Spot Repair (1) <1m 28.5 to 29.5m downstream of MH 3_238				$5,000.00							$5,000.00	$5,000.00	
10	51 Street	48 A Avenue	SAP 0233	3_227.00	3_226.00	50.8	3.6	200	VCP	Down	50.8	100.0%	No	N/A	2	2	2	Varying vertical and horizontal alignment. Minor spiral cracks through out segment, with one moderate fracture location	CIPP Spot Repair (1) <1m 49.8 to 50.8m downstream of MH 3_227				$5,000.00							$5,000.00	$5,000.00	
11	Alley	South 49 Avenue	SAP 1450	3_234.00	3_233.01	31.9	5.4	200	VCP	Up	13.9	43.6%	Yes	Encrustation	2	3	3	Segment in fair structural condition, mineral deposits at joints becoming problematic	Mechanically encrustation and provide new CCTV	$486.50												$486.50
11a	Alley	South 49 Avenue	SAP 1439	3_233.01	3_234.00		5.4	200	VCP	Down	31.9	100%	No	N/A	2	3	3	Segment in fair structural condition, mineral deposits at joints becoming problematic	Recommendation as above	11165												$1,116.50
12	50 Avenue	48 Street	SAP 1438	3_238.01	3_238.00	3.6	2.7	200	PVC	Down	3.6	100.0%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
13	49 Street	51 Avenue	SAP 1341	3_239.02	3_240.00	106.2	2.5	200	VCP	Down	106.2	100.0%	No	N/A	5	4	1	Poor CCTV quality because camera needed to be pulled through segment due to grease, debris and encrustation build up. Operational efficiency hampered by sections not exhibiting self cleaning velocities. *Collapsed pipe observed immediate action Required	Excavated Spot Repair (1)<4m 81.5 to 85.5m downstream of MH 3_239.02. Reconnect Service Lateral. Maintain positive flushing program to reduce mineral and grease build up.	$3,717.00	$12,000.00							$12,000.00	$15,717.00		
14	51 Avenue	49 Street	SAP 0232	3_239.02	3_700.00	99.8	4	200	VCP	Up	93.9	94.1%	Yes	Material change	2	2	3	Segment in fair structural condition, intermittent attached grease deposits and minor encrustation build up and joints due to material change	Maintain positive flushing program to reduce mineral and grease build up	$3,500.00										$3,500.00		
14a	51 Avenue	49 Street	SAP 0232	3_700.00	3_239.02		4	200	PVC	Up	5.9	6%	Yes	Material change	1	1	3	Acceptable condition no comment **(Reverse Run)**	Recommendation as above												
15	49 Street	50 Avenue	SAP 1456	3_240.00	3_241.00	64.2	3.5	200	VCP	Down	64.2	100.0%	No	N/A		3	2	Poor CCTV quality because camera needed to be pulled through segment due to grease, and encrustation build up. Structural assessment not possible, no observable deficiencies noted	Maintain positive flushing program to reduce mineral and grease build up.	$2,275.00											$2,275.00	
16	49 Street	49 Avenue	SAP 0053	3_242.00	3_243.00	88.1	4.4	200	VCP	Down	42.4	48.1%	Yes	Encrustation	4	3	1	Segment has multiple minor to severe fractured sections of sewer soil visible at some locations. Low velocity and encrustation deposits	Full Length Liner						$17,200.00				$17,200.00			
16a	49 Street	49 Avenue	SAP 0053	3_243.00	3_242.00		4.4	200	VCP	Up	45.7	52%	Yes	Encrustation	4	4	1	Segment has multiple moderate fractured and broken sections of sewer, Moderate to severe encrustation deposits at joints	Recommendation as above						$18,000.00				$18,000.00			
17	49 Street	48 A Avenue	SAP 1638	3_244.00	3_243.00	86.9	3.2	200	VCP	Down	86.9	100.0%	No	N/A	4	3	2	Segment has multiple minor to moderate cracks and fractures. Deficiencies consist of spiral, longitudinal, circumferential, and spider web. Soil visible at one location. Minor to moderate encrustation present at many of the fractures	Full Length Liner						$34,800.00						$34,800.00	
18	49 Street	48 A Avenue	SAP 1301	3_245.00	3_244.00	86	3.1	200	VCP	Down	70	81.4%	Yes	Intruding Service	4	2	2	Segment in very poor structural condition from beginning to end. Deficiencies consist of spiral, longitudinal, circumferential, and spider web cracks and fractures. Fine root propagation at many joints, encrustation and sag/silt build	Full Length Liner						$28,000.00						$28,000.00	
18a	49 Street	48 A Avenue	SAP 1301	3_246.00	3_245.00		3.1	200	VCP	Up	15	1.7%	Yes	Intruding Service	4	2	2	**(Reverse Run)** of above segment assessment consistent with above	Recommendation as above						$5,800.00				$5,800.00			
19	49 Street	48 Avenue	SAP 1693	3_246.00	3_245.00	89	2.9	200	VCP	Down	88.9	99.9%	No	N/A	4	3	2	Segment in poor to very poor structural condition from beginning to end. Deficiencies consist of spiral, longitudinal, circumferential, and spider web cracks and fractures. Fine to medium root propagation at service connections and joints, operational capacity fair	Full Length Liner, Maintain positive flushing program to reduce debris build up, and root propagation	$3,150.00					$39,600.00					$39,600.00	$39,150.00	
20	51 Street	48 A Avenue	SAP 0470	3_251.00	3_252.00	113	2.9	200	VCP	Down	112.1	99.2%	No	N/A	4	3	1	Segment in poor to very poor structural condition from beginning to end. Deficiencies consist of minor to moderate spiral, longitudinal, circumferential, cracks and fractures. Multiple sags and infiltration, service laterals broken, encrustation deposits	Full Length Liner						$45,200.00	$45,200.00						
21	51 Street	49 Avenue	SAP 1671	3_252.00	3_253.00	91	4.15	200	VCP	Up	90.3	99.2%	No	N/A	3	4	1	Segment exhibits minor to moderate spiral, longitudinal, circumferential and spider web cracks and fractures, Poor horizontal and vertical has contribute moderates mineral deposits in latter section of run. (4) CIPP spot repairs should be considered at minimum for immediate attention	**Option 1.** CIPP Spot Repairs (4)<3m 0 to 3m, <1m 8.5 to 9.5m, <10m 85 to 75m, and <3m 88 to MH 3_253.00 upstream of 3_252.00. Maintain positive flushing program to reduce mineral and grease build up. **Option 2.** Mechanically encrustation and provide new CCTV	$3,185.00			$15,000.00		$8,000.00	$24,400.00			$26,185.00	$39,400.00			
22	51 Street	50 Avenue	SAP 0635	3_256.00	3_255.00	77	3.1	200	VCP	Down	75.6	98.2%	No	N/A		4	1	Poor CCTV quality because camera needed to be pulled through segment due to grease, debris and encrustation build up. Structural assessment not possible. Operational efficiency hampered by sections not exhibiting self cleaning velocities	**Option 1.** Mechanically encrustation and provide new CCTV. **Option 2.** Full Length Liner	$2,695.00						$30,800.00			$2,695.00	$30,800.00			
23	51 Street	51 Avenue	SAP 1632	3_257.00	3_256.00	74	2.9	200	VCP	Down	73.5	99.3%	No	N/A	3	3	2	Minor to Moderate spiral, longitudinal and spider web cracks and fractures throughout segment. Four main areas of concern which require (5) CIPP Spot Repairs. If budget allows consider full length liner. Operational efficiency being restricted by mineral deposits to 20%	**Option 1.** CIPP Spot Repairs (5)<10m 0 to 10m, <2m 28 to 28m, <3m 47 to 50m, <1m 56 to 57m, and <2m 65 to 68m downstream of MH 3_257.00 **Option 2.** Full Length Liner				$20,000.00		$8,000.00	$29,600.00			$28,000.00	$29,600.00		
24	53 Street	51 Avenue	SAP 1409	3_650.00	3_202.00	87	2.2	200	VCP	Down	87.4	100.0%	No	N/A	2	4	2	Segment in generally fair structural condition with minor cracks where full CSA is observable, with (2) exceptions of moderate longitudinal and circumferential cracks and fractures. Operational capacity is also fair. Survey abandon due to dropshaft pipe at 87.4m	CIPP Spot Repair (2) <3m 28.5 to 31.5m, and <2m 49 to 50m downstream of MH 3_650.00				$10,000.00							$10,000.00	
25	49 Street	49 Avenue	SAP 1332	3_102.07	3_120.66	67	4	200	VCP	Down	66.2	98.8%	No	N/A	2	2	2	Segment in fair structural condition with minor longitudinal and circumferential cracks throughout length, with the exception of 0.7m downstream of MH 3_1.39.07	CIPP Spot Repair (1) <2m 0 to 2m, downstream of MH 3_120.07				$5,000.00							$5,000.00	
26	48 Street	49 Avenue	SAP 1603	3_120.8	3_440.00	55	4.4	200	VCP	Down	54.5	99.1%	No	N/A	2	2	3	Segment in fair structural condition with minor longitudinal and circumferential cracks throughout length. Root propagation is present in the joints and service tap-in	**Option 1.** Progressive flushing program to abate root propagation **Option 2.** CIPP Spot Repair <1.0m 11 to 2 1m downstream of MH 3_120.08	$1,890.00					$8,000.00					$1,890.00		$8,000.00	
27	50 Avenue	45 Street	SAP 1642	3_420.00	3_430.00	109	3.8	200	VCP	Down	108.2	99.3%	No	N/A	5	2	1	Segment in generally fair structural condition with minor longitudinal and circumferential cracks throughout the length, with the exception of (2) broken sections of sewer. Varied vertical alignment with many disjointed pipe joining's	**Option 1.** CIPP Spot Repair (1)<2m 67.5 to 69.5m, If possible CIPP Spot Repair <3m 109.2 m downstream to MH3_430.00 **Option 2.** CIPP Spot Repair (1)<2m 67.5 to 69.5m Excavate and replace broken VCP with new PVC. <1m 108.2m downstream to MH 3_430.00		$6,000.00			$10,000.00				$10,000.00	$11,000.00			
28	46 Street	50 Avenue	SAP 1116	3_430.00	3_440.00	104	4.1	200	VCP	Down	103.7	99.7%	No	N/A	3	2	2	Segment in generally fair structural condition with minor circumferential fractures throughout the length, although 2 service tap ins are impacted. Minor to moderate encrustations is also present at joints and attached to sewer surfaces	CIPP Spot Repair (2) <1m 38 to 39m, <2m 72 to 74m, and <1m 8.5 to 10m downstream of MH 3_430.00				$15,000.00							$15,000.00	
29	46 Street	50 Avenue	SAP 1760	3_430.01	3_430.00	24	3.6	200	VCP	Down	23.3	97.1%	No	N/A	2	2	3	Segment in generally fair structural condition with minor circumferential fractures over the length. Minor to moderate encrustations is also present at joints	Maintain positive flushing program to reduce mineral build up.	$840.00											$840.00	
30	46 Street	46 Street	SAP 1117	3_440.00	3_450.00	131	Unknown	200	VCP	Down	130.3	99.5%	No	N/A	4	1		Poor CCTV quality because of flow and sags, unable to make structural assessment. Moderate fractures at joints and service tap ins	Mechanically encrustation and provide new CCTV. May require bypass pumping in order wish to retain CCTV.	$4,695.00								$4,695.00				$4,695.00
31	47 Street	49 Avenue	SAP 500	3_450.01	3_450.00	103	Unknown	200	Concrete	Down	70	68.0%	Yes	Encrustation	3	4	2	Sulfate damage with exposed aggregate to projected aggregate visible over entire length. Light to moderate encrustation at joints and service tap ins. Pervious excavated point repair has settled resulting in a sag of 10%, additional sag located at point of 50%	Full Length Liner						$28,000.00					$28,000.00		
31a	47 Street	49 Avenue	SAP 500	3_450.01			Unknown	200	Concrete	Up	19.7	18%	Yes	Encrustation	3	4	2	Sulfate damage from spalled to exposed aggregate surface throughout length. - Light to severe encrustation at joints and settled debris (sand) within the sewer channel **(Reverse Run)**	Recommendation as above						$13,200.00					$13,200.00		
33	47 Street	46 Avenue	SAP 771	3_452.00	3_450.00	122	Unknown	200	PVC	Down	118.7	97.3%	No	N/A	1	2	3	Acceptable condition no comment	No recommendation at this time													
34	47 Street	46 Avenue	SAP 1610	3_453.00	3_452.00	78	Unknown	200	PVC	Down	78	100.0%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
35	47 Street	46 Avenue	SAP 1508	3_455.00	3_453.00	54	Unknown	200	PVC	Down	33.8	62.6%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
36	47 Street	51 Avenue	SAP 1538	11_000.01	11_000.02	117	Unknown	200	Concrete/VCP	Down	23.2	19.8%	Yes	Brick	5	3	1	Multiple lengths of concrete pipe are broken with missing pieces and soil visible showing, encrustation present at longitudinal fractures. Operational efficiency hampered by debris in	Excavate and replace existing sewer 0 to 10.1m downstream of MH 11_000.01 with new SDR-35 PVC			$12,000.00							$12,000.00			
36a	47 Street	51 Avenue	SAP 1538	11_000.02	11_000.01		Unknown	200	VCP	Up	93	79%	Yes	Brick	2	3	3	Varying vertical and horizontal alignment, multiple sag of greater than 50 %, settled debris in channel **(Reverse Run)**	Maintain positive flushing program to reduce mineral and debris build up	4095												$4,095.00
37	Laneway	ECF47 Street	SAP 0672	3_450.04	3_453.00	64	2.3	200	VCP	Down	63	98.4%	No	N/A	2	3	2	Segment in generally fair structural condition with one area of moderate spiral fractures impacting a service tap-in. Pervious excavated point repair has settled resulting in a sag of 10%, additional sag located at point of 50%	CIPP Spot Repair (1)<1m 34 to 35m, downstream of MH 3_450.04				$5,000.00							$5,000.00		
38	46 Avenue	46 Street	SAP 0900	3_120.09	3_120.08	8.5	4.3	200	VCP	Down	83.8	98.6%	No	N/A	2	2	3	Segment in generally fair structural condition with minor spiral fractures. Poor vertical and horizontal alignment evident	No recommendation at this time													
39	49 Avenue	49 Avenue	SAP 1052	3_241.00	3_242.00	86	3.6	200	VCP	Down	85.6	99.5%	No	N/A	5	3	1	Segment in poor to failed structural condition from beginning to end. Deficiencies consist of minor to moderate spiral, longitudinal, circumferential, and cracks and fractures and broken pipe. Moderate to severe encrustation attached encrustation on pipe walls and service laterals	**Option 1.** CIPP Spot Repair (3)<2m 30 to 32m, <2m 53.5 to 55.5m, <2m 79.5 to 81.5m, downstream of MH 3_241.00 **Option 2.** Full Length Liner				$15,000.00			$34,400.00			$15,000.00	$34,400.00			
40	50 Avenue	48 Street	11_000.03	11_001.00	3_258.00	121	Unknown	200	PVC	Down	120.1	99.3%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
41	46 Street	46 Avenue	SAP 1720	3_120.07	Dead End 3_120.06	109	Unknown	200	VCP	Up	63.3	58.1%	Yes	Pipe Collapse	5	4	1	Segment has varied vertical alignment from beginning to end. Deficiencies consist of joint infiltration, spiral and longitudinal fractures and collapsed pipe. Operational efficiency hampered by multiple sags, and poor vertical and horizontal alignment. **Note: Find source of infiltration, likely watermain or water service leak in the area**	**Option 1.** Full length excavation & placement with placement of New Manhole 65m upstream of MH3_120.07, abandonment of remaining existing sewer to MH 3_120.06. **Option 2.** Open excavation remove and replacement 0 to 5m upstream of MH3_120.07. CIPP Spot Repairs (1) <4m 53 to 58 m upstream of MH 3_120.07, placement of new Manhole 65m upstream of MH3_2017.06, abandonment of remaining existing sewer to MH 3_120.06			$15,000.00	$78,000.00		$7,500.00			$14,000.00	$1,760.00	$36,260.00	$93,760.00		
42	48 Street	50 Avenue	SAP 1640	3_271.00	3_238.01	166	Unknown	200	VCP	Up	142.5	85.8%	Yes	Pipe Collapse	5	4	1	Segment has failed with collapse of sewer evident, multiple lengths requiring remedial work due to fractures and broken pipe. Very poor vertical and horizontal alignments evident with settled debris deposits and sags through length	**Option 1.** Full length replacement of existing sewer with new PVC, New MH at mid point **Option 2.** Excavate and replace with PVC. (3) 9 to 17m, and 141.5 to 145.5m upstream of MH 3_271.00, CIPP Spot Repair (5) <2m 4 to 6m, <3m 26 to 28m, <2m 76 to 104m, New MH at mid point upstream of MH 3_271.00		$36,000.00	$199,200.00	$15,000.00		$22,400.00			$14,000.00		$87,400.00	$213,200.00		
43	50 Avenue	47 Street	SAP 0686	11_000.05	Dead End	15	Unknown	200	PVC	Up	14.9	99.3%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
44	Laneway	48 Street	SAP 2127	Dead End	3_450.03	72	1.8	200	PVC	Down	71.1	98.8%	No	N/A	1	1	3	Acceptable condition no comment	No recommendation at this time													
45	52 A Street	50 Avenue	SAP 1610	3_210.00	3_211.00	70	3	200	VCP	Down	68.2	90.9%	No	N/A	3	3	2	Minor to Moderate circumferential, longitudinal and spiral cracks and fractures throughout segment, including many tap break ins in varying condition. Operational efficiency hampered by sections not exhibiting self cleaning	Full Length Liner						$30,000.00						$30,000.00	
46	50 Avenue	52 A Street	SAP 1619	3_210.00	3_221.00	99	2.8	200	VCP	Down	6.9	7.0%	Yes	Debris		5	1	Evaluation incomplete, insufficient CCTV to review Sewer plugged with debris **(Reverse Run**	Flush sewer/clean of debris provide CCTV of segment for evaluation													
47	52 A Street	49 Avenue	SAP 0268	3_211.00	3_212.00	97	3.1	200	VCP	Down	103.6	106.8%	No	N/A	4	3	1	Segment in very poor to failed structure condition from beginning to end. Deficiencies consist of minor, moderate, and severe spiral, longitudinal, circumferential, and spiderweb cracks and fractures. Multiple moderate sags hindering operational efficiency	Full Length Liner						$38,800.00					$38,800.00		
48	53 Street	51 Avenue	SAP 0315	3_220.00	3_219.0	54	2.5	200	VCP	Down	22.5	41.7%	Yes	Intruding Service	5	3	1	Segment on verge of collapse, multiple lengths requiring remedial work due to fractures and broken pipe. Moderate encrustation at joints and service tap ins. Infiltration and exfiltration observed.				$22,800.00	$10,000.00						$32,800.00		
48a	52 Street	51 Avenue	SAP 0315	3_219.0	3_220.00		2.5	200	VCP	Up	28.6	53%	Yes	Intruding Service	5	3	1	Assessment consistent with above **(Reverse Run)**	Excavate and replace broken VCP with new PVC 13 to 22m downstream of MH 3_220.00, Reconnect existing service laterals (2) CIPP Spot Repairs (2)<1m 42 to 43.5m, <1m 157.5 to 167.7m upstream of MH 3_220.00												
49	52 Street	50 Avenue	SAP 2059	3_219.00	3_220.05	35	2.4	200	VCP	Down	22.3	63.7%	Yes	Intruding Service	5	3	1	Segment on verge of collapse, multiple lengths requiring remedial work due to fractures and broken pipe. Moderate encrustation at joints and service tap ins. Infiltration and exfiltration observed	Full Length Liner						$14,000.00					$14,000.00		
49a	52 Street	50 Avenue	SAP 2059	3_220.05	3_219.00		2.4	200	VCP	Up	12.7	34%	Yes	Intruding Service	3	2	1	Segment in poor condition with poor material change transitions from PVC to VCP. Folded PVC piece used as lead out MH_220.05. Assessment consistent with above **(Reverse Run)**	Recommendation as above												
50	50 Avenue	52 Street	SAP 0645	3_215.00	Dead End	52.6	2.7	200	VCP	Up	52.6	100.0%	No	N/A	2	3	3	Segment has varied vertical and horizontal alignment resulting in multiple moderately disjointed joints. Infiltration and exfiltration noted CCTV camera frozen 350m in 50%	No recommendation at this time												
51	50 Street	51 Avenue	SAP 2025	3_272.00	3_272.01	63	2.9	200	VCP	Down	13.9	22.1%	Yes	Encrustation	4	3	1	Segment in very poor structural condition at the beginning. Deficiencies consist of moderate to severe longitudinal, circumferential and spider web cracks and fractures. Moderate to heavy encrustation is present at joints and fractures, hindering operational efficiency	Full Length Liner													
51a	50 Street	51 Avenue	SAP 2025	3_272.01	3_272.00		2.9	200	VCP	Up	51.5	82%	Yes	Encrustation	5	3	1	Segment in very poor to failed structure condition. Deficiencies consist of moderate to severe longitudinal, circumferential and spider web cracks and fractures. Pipe has deformed and is near collapse. Moderate to heavy encrustation is present at joints and fractures, hindering operational efficiency. Assessment consistent with above **(Reverse Run)**	Excavated Spot Repair (1)<4m 49 to 53m upstream of MH 3_272.01 Full Length Liner			18000			$15,200.00					$45,200.00			
52	51 Street	50 Avenue	SAP 0238	3_255.00	3_253.00	82	3.2	200	VCP	Down	66.4	81.0%	Yes	Encrustation	4	4	1	Segment in very poor structural condition. Deficiencies consist of moderate to severe longitudinal, circumferential and spider web cracks and fractures. Moderate to heavy encrustation is present at joints and fractures, hindering operational efficiency. Settled debris and multiple sags as a result of varied vertical alignment.	**Option 1.** CIPP Spot Repair (2)<3m 19 to 22m, <4m 27 to 31m, <11 m 53 to 64m, downstream of MH 3_255.00 . *Excavate and replace broken VCP with new PVC <9m 43 to 52m downstream of MH3_255.00 **Option 2.** Full Length Liner *Excavate and replace broken VCP with new PVC <9m 43 to 52m downstream of MH 3_255.00			$10,800.00	$5,000.00	$7,500.00	$8,800.00	$35,200.00			$32,100.00	$46,000.00			
52a	52 Street	51 Avenue	SAP 0238	3_253.00	3_255.00		3.2	200	VCP	Up	14.3	17%	Yes	Encrustation	3	4	1	Minor to Moderate circumferential, longitudinal and spiral cracks and fractures throughout segment. Operational efficiency hampered with moderate encrustation attached and joints, sag locations. Assessment consistent with above **(Reverse Run)**	Full Length Liner													
53	50 Avenue	52 Street	SAP 1932	3_254.00	3_221.00	46	2.8	200	VCP	Down	1	2.2%	Yes	Blockage		5	1	Evaluation incomplete, insufficient CCTV to review Sewer plugged with debris **(Reverse Run**	Flush sewer/clean of debris provide CCTV of segment for evaluation	$1,610.00									$1,610.00			
54	50 Avenue	51 Street	SAP 0263	3_254.00	3_255.00	53	2.9	200	VCP	Down	51	96.2%	No	N/A	N/A	3	2	3	Minor to Moderate longitudinal and spiral cracks and fractures throughout segment. Operational efficiency hampered with moderate sags and minor attached encrustation and joints.	CIPP Spot Repair (1)<5m 24 to 29m, downstream of MH 3_254.00						$7,500.00						$7,500.00	
55	50 Avenue	50 Street	SAP 0266	3_260.00	3_273.00	56	2	200	VCP	Down	1.2	2.1%	Yes	Ice Blockage			1	Evaluation incomplete, insufficient CCTV to review **(Reverse Run Required)**	Flush sewer/clean of debris and ice, provide CCTV of segment for evaluation	$1,960.00									$1,960.00			
56	51 Avenue	50 Street	SAP 0621	3_272.00	3_239.02	104	3	200	VCP	Down	55.2	53.1%	Yes	Pipe Collapse	5	5	1	Segment in very poor to failed structure condition, sewer has collapsed. . Deficiencies consist of moderate to severe longitudinal, circumferential and spider web cracks and fractures. Moderate encrustation is present at joints	**Option 1.** Excavate and replace broken VCP with new PVC (2) <3m 16 to 19 m <20m 51 to 76m downstream of MH3_272.00 **Option 2.** Excavate and replace broken VCP with new PVC (2) <3m 16 to 19 m <20m 51 to 76m downstream of MH3_272.00 . CIPP Spot Repair (2) <51 m 0 to 5 m, <28m 76 to 104m downstream of MH 3_272.00		$9,000.00	$30,800.00						$31,600.00		$39,080.00	$70,400.00		
56a	51 Avenue	50 Street	SAP 0621	3_239.02	SAP 0621		3	200	VCP	Up	29.6	#DIV/0!	Yes	Pipe Collapse	5	5	1	Assessment consistent with above **(Reverse Run)**	Recommendation as above												
57	53 Street	50 Avenue	SAP 0318	3_203.00	3_201.00	91	2.3	200	VCP	Up	90.9	99.9%	No	Pipe Capped at MH	3	3	2	Segment in fair to moderate structural condition. Deficiencies consist of longitudinal, and spiral fractures. Minor to moderate encrustation is present at service tap ins and moderate sags and	CIPP Spot Repair (2)<2m 2.5 to 4.5m, <2m 28.5 to 30.5 m upstream of MH3_203.00			$10,000.00								$10,000.00		
						4616.4					4310.9												

APPENDIX E - DOWNTOWN INFRASTRUCTURE RENEWAL PLAN FIGURES

- Figure E-1: Block Renewal Priority Plan
- Figure E-2: Overall Block Rehabilitation Phasing Plan
- Figure E-3: 2023-2025 Block Rehabilitation Phasing Plan
- Figure E-4: 2026-2028 Block Rehabilitation Phasing Plan
- Figure E-5: 2029-2031 Block Rehabilitation Phasing Plan
- Figure E-6: 2032-2034 Block Rehabilitation Phasing Plan
- Figure E-7: 2035-2037 Block Rehabilitation Phasing Plan
- Figure E-8: 2038-2040 Block Rehabilitation Phasing Plan
- Figure E-9: 2041-2043 Block Rehabilitation Phasing Plan
- Figure E-10: 2044-2047 Block Rehabilitation Phasing Plan
- Figure E-11: 1:5 Year Storm Event Surface Surcharge Locations



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Platinum member

Legend

Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

CITY OF Camrose

FIGURE E-1

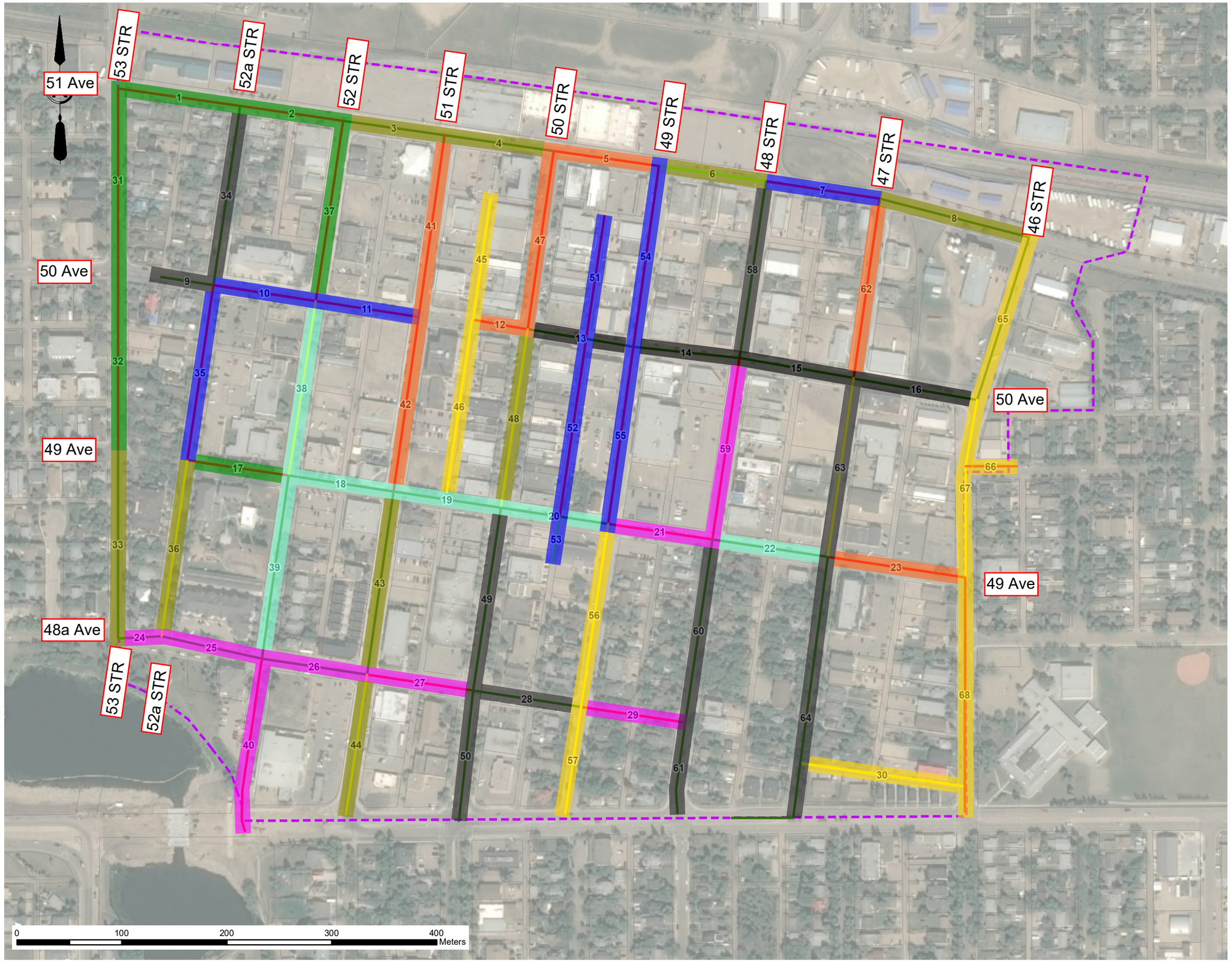
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

BLOCK RENEWAL PRIORITY PLAN

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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2023-2025
- 2026-2028
- 2029-2031
- 2032-2034
- 2035-2037
- 2038-2040
- 2041-2043
- 2044-2047

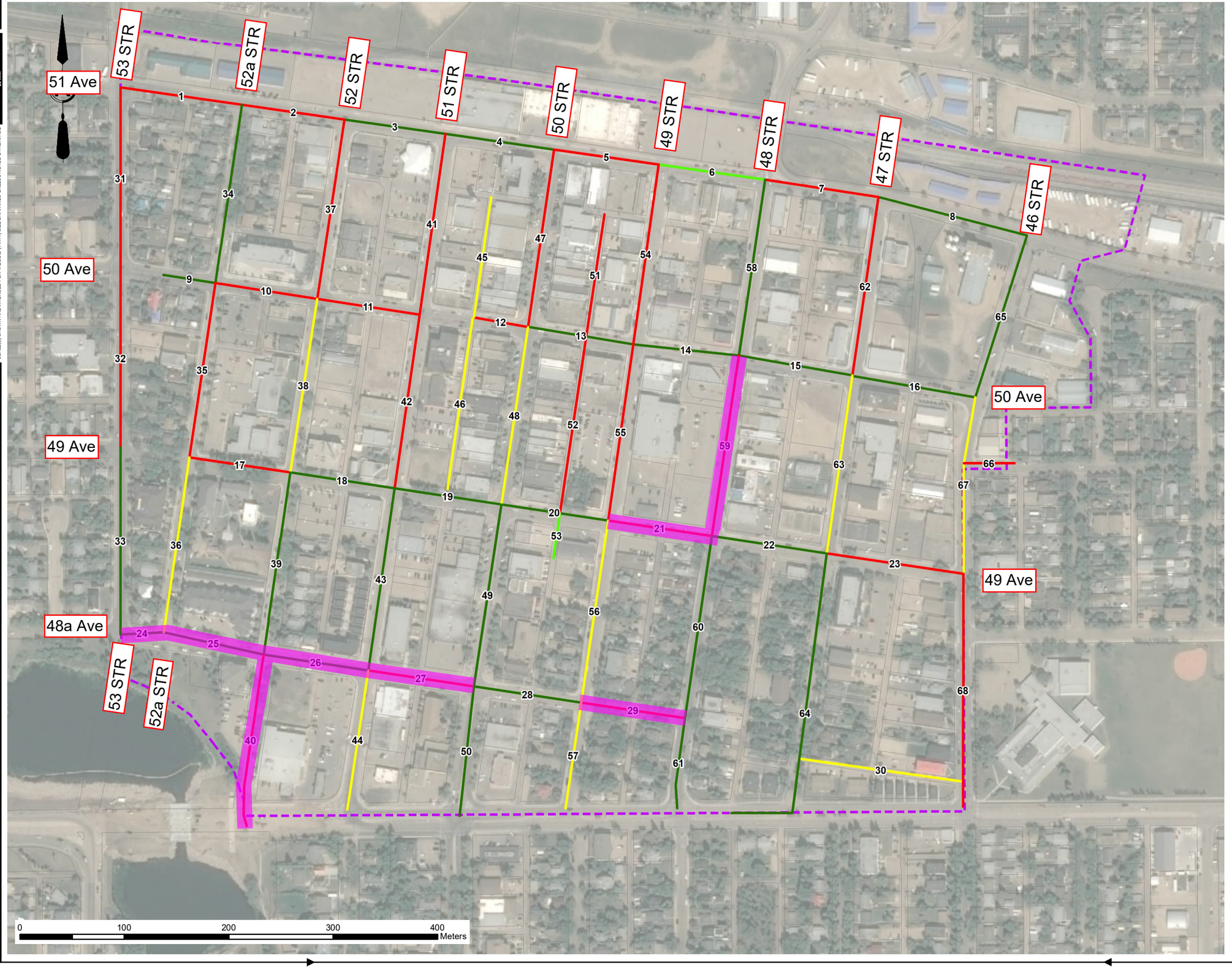
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FIGURE E-2

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

OVERALL BLOCK REHABILITATION
PHASING PLAN

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APPROVED	D.FRIESEN
DATE	2024JAN30



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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2023-2025

CITY OF Camrose

FIGURE E-3

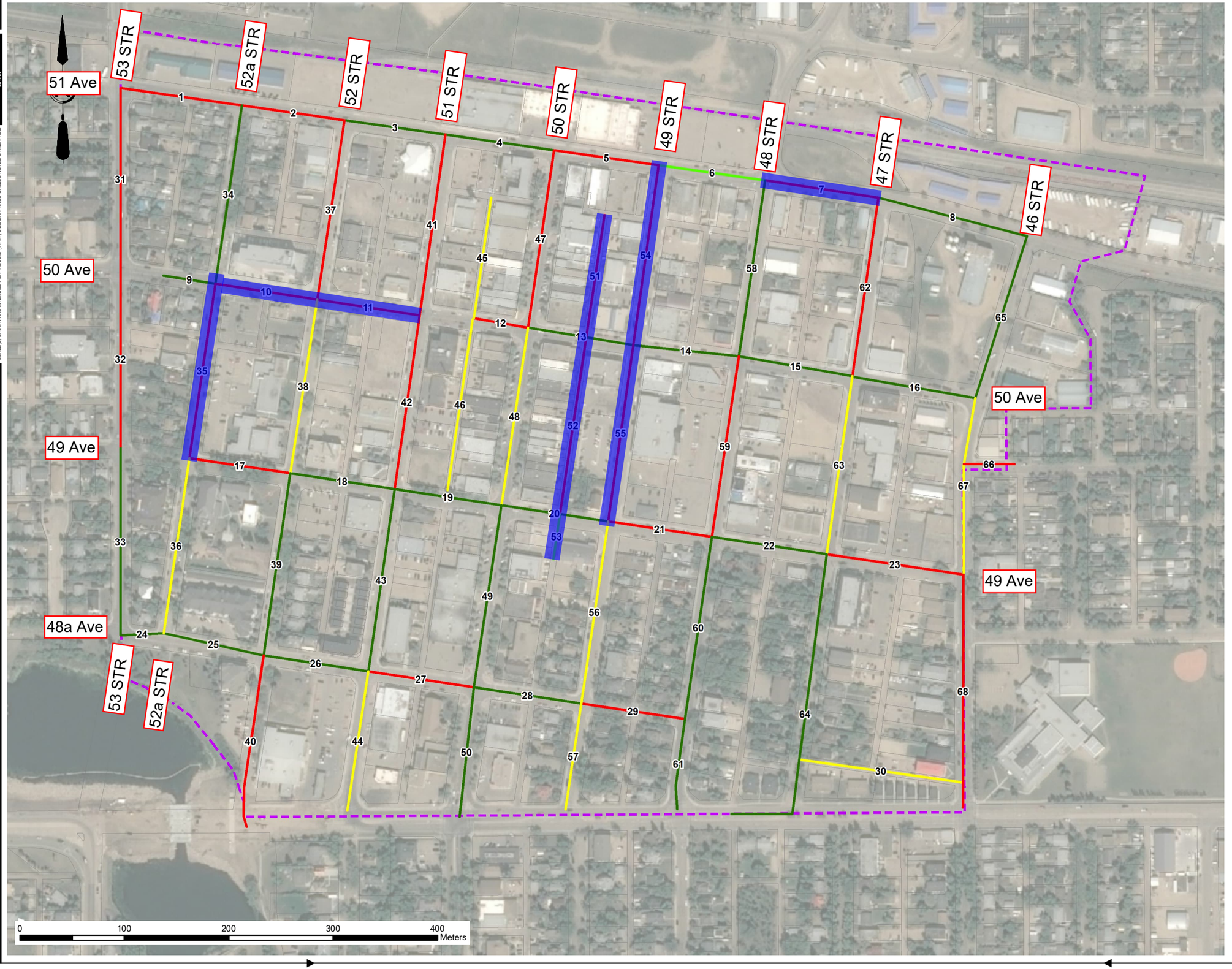
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2023-2025 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2026-2028

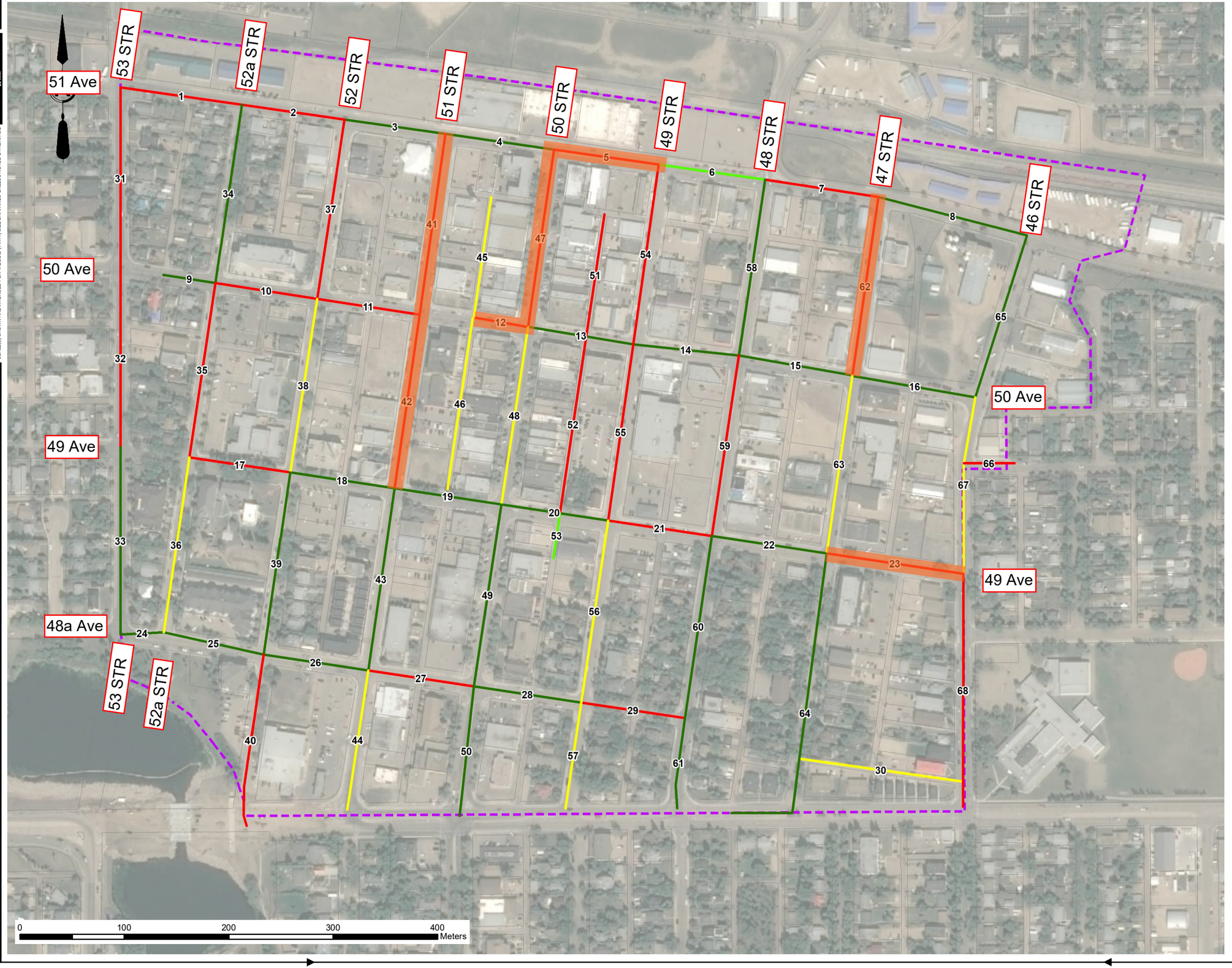
CITY OF Camrose

FIGURE E-4

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2026-2028 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	D.FRIESEN
DATE	2024JAN30



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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2029-2031

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FIGURE E-5

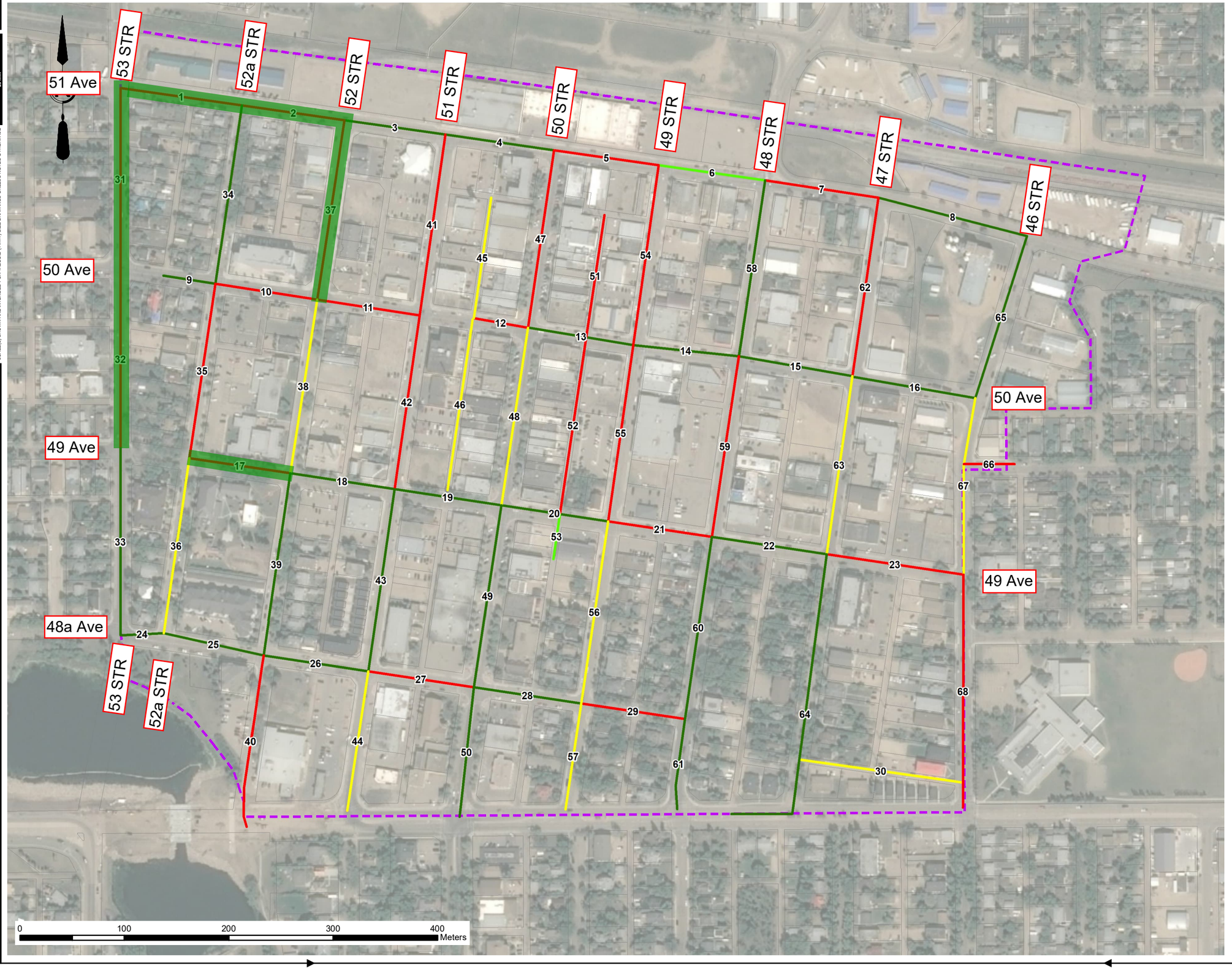
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2029-2031 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2032-2034

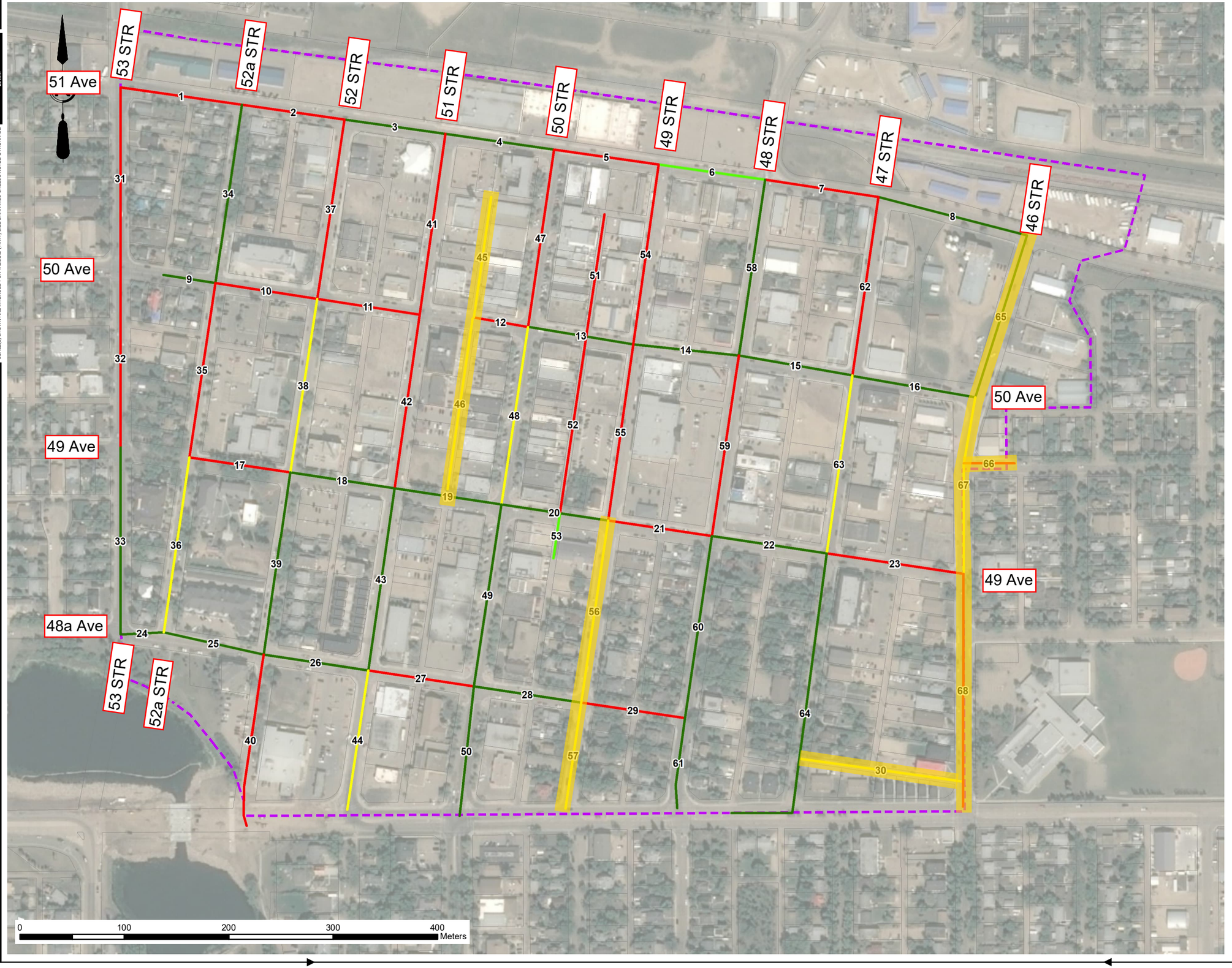
CITY OF Camrose

FIGURE E-6

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2032-2034 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2035-2037

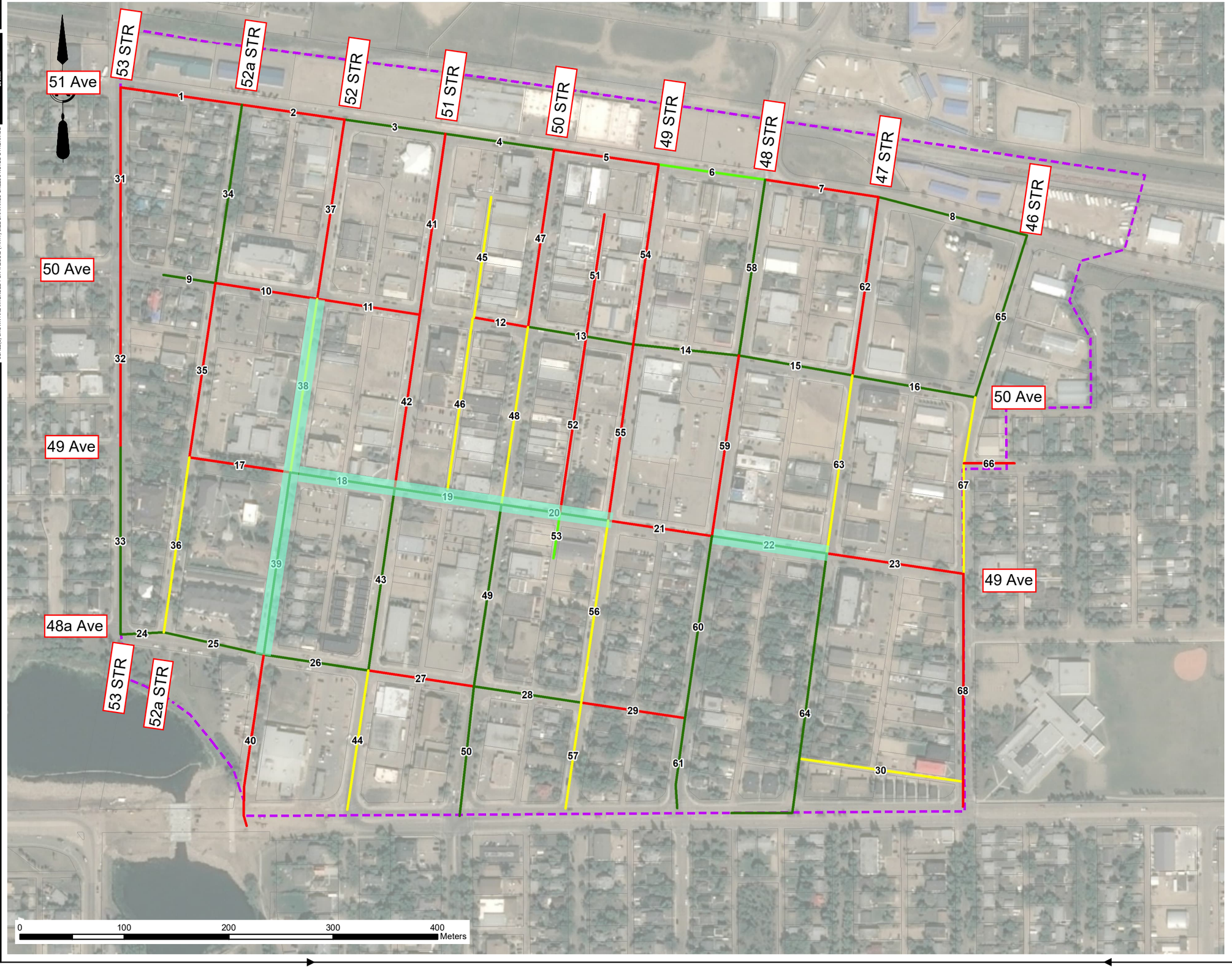
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FIGURE E-7

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2035-2037 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	D.FRIESEN
DATE	2024JAN30



Legend

Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2038-2040

FIGURE E-8

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

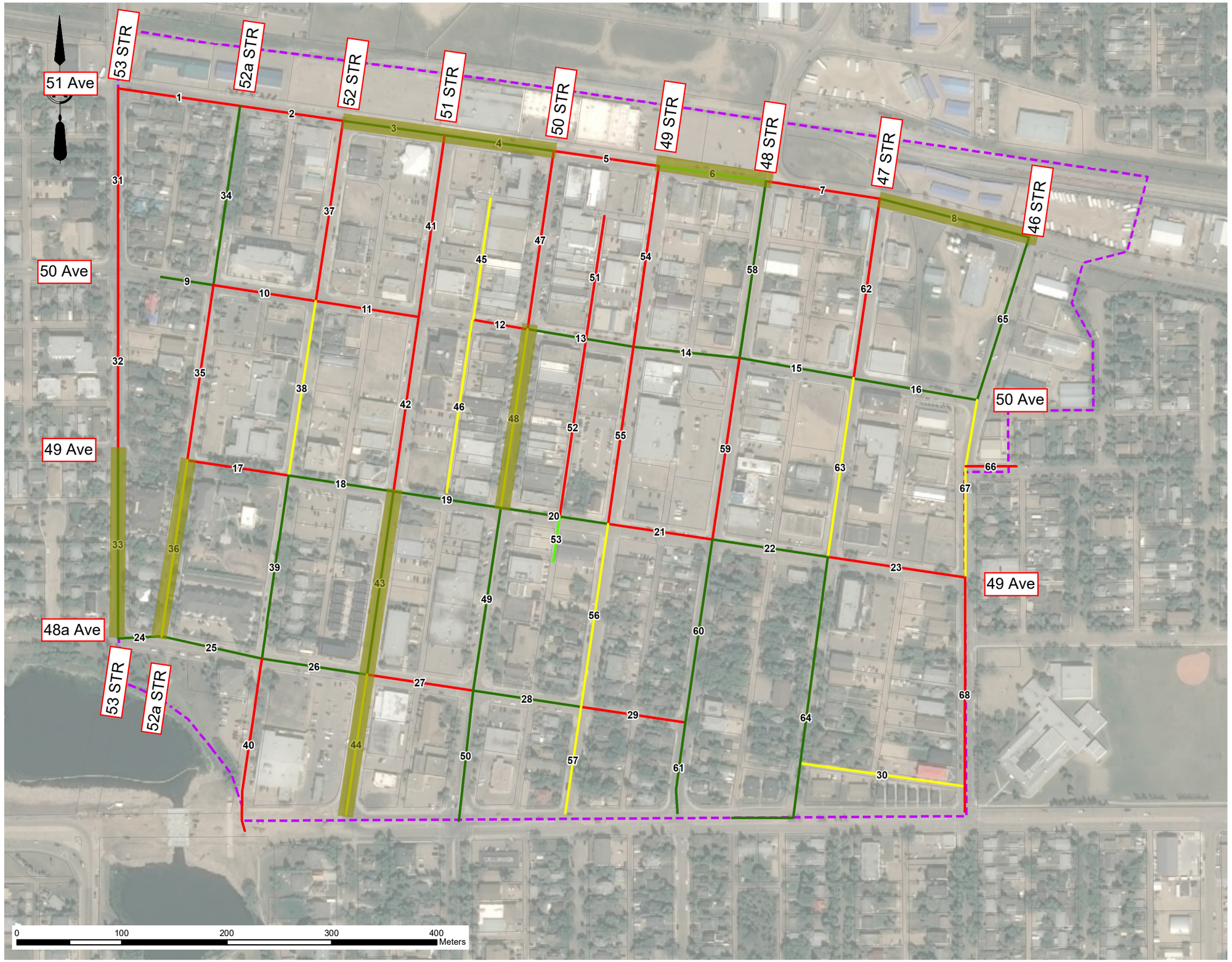
2038-2040 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	D.FRIESEN
DATE	2024JAN30

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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2041-2043

CITY OF Camrose

FIGURE E-9

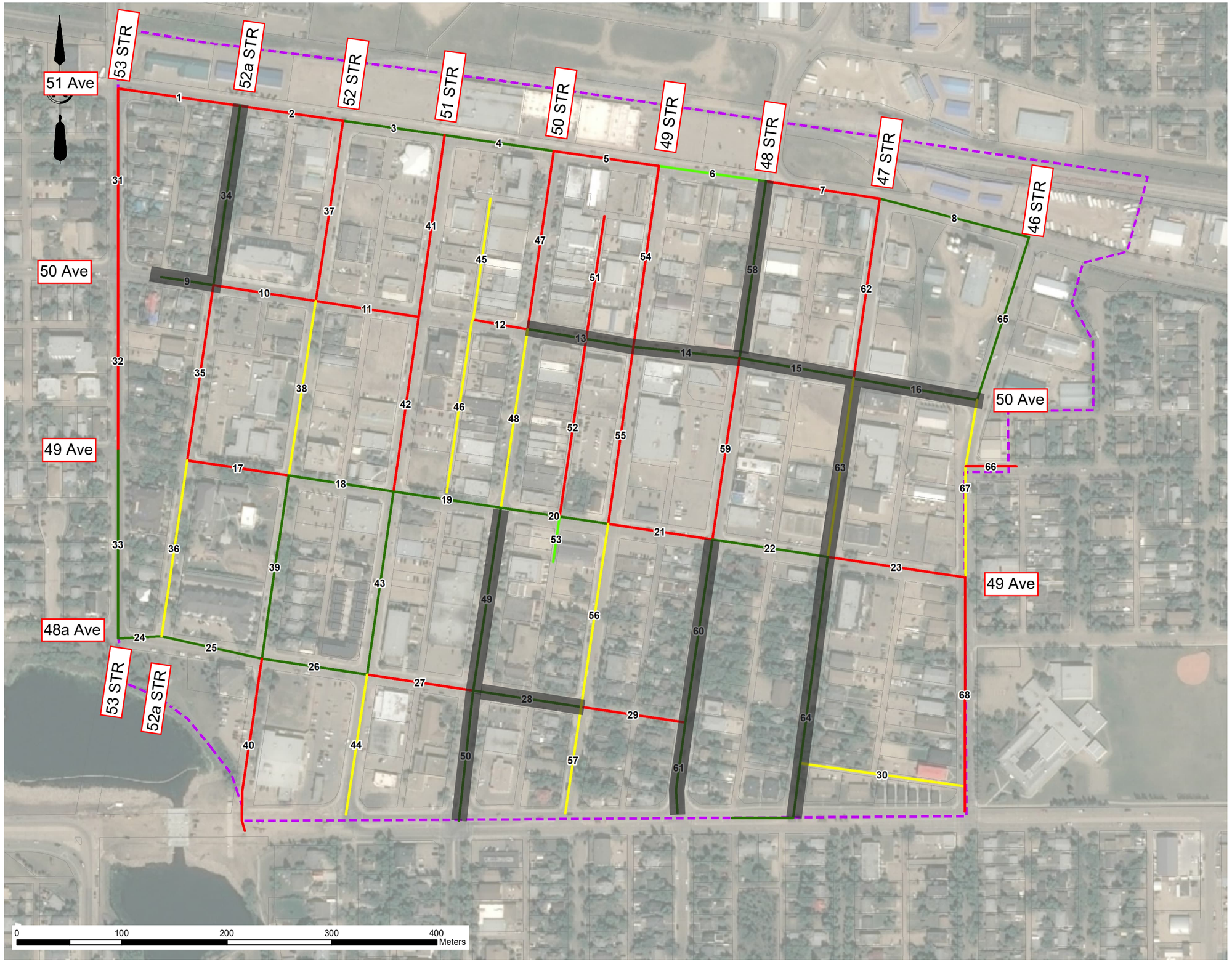
CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2041-2043 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	D.FRIESEN
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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

Block Rehabilitation Years

- 2044-2047

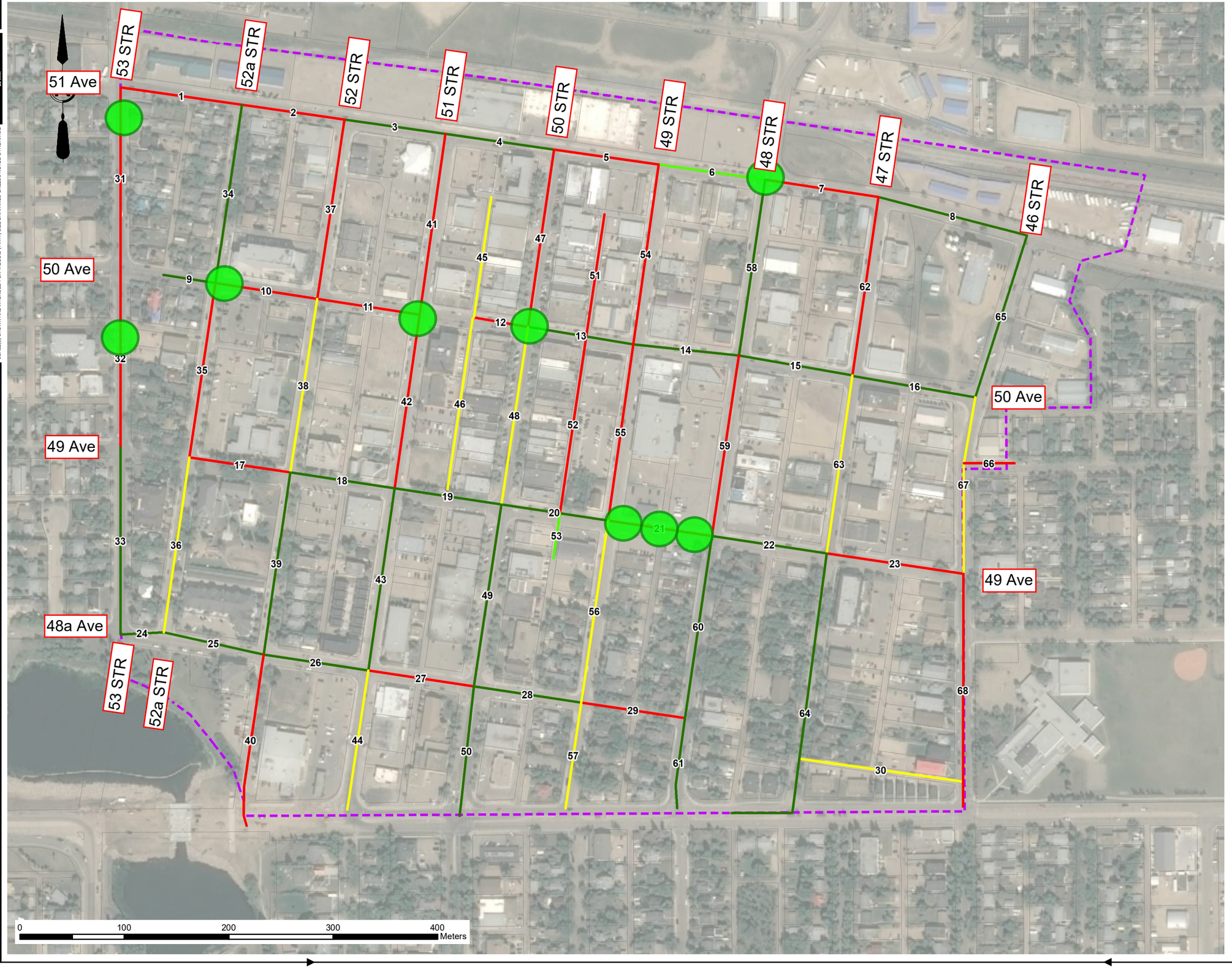
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FIGURE E-10

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

2044-2047 BLOCK REHABILITATION
PHASING PLAN

AE PROJECT No.	2020-3737
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APPROVED	D.FRIESEN
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Project Boundary

Block Upgrade - Range of Importance

- Priority 1
- Priority 2
- Priority 3
- Unknown

1:5 Storm Event Surface Surcharge Locations

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FIGURE E-11

CITY OF CAMROSE
DOWNTOWN INFRASTRUCTURE RENEWAL PLAN

1:5 YEAR STORM EVENT
SURFACE SURCHARGE LOCATIONS

AE PROJECT No.	2020-3737
SCALE	1:3,500
APPROVED	D.FRIESEN
DATE	2024JAN30

APPENDIX F - SUMMARIES

- Table F-1: Block Scoring Evaluation Summary
- Table F-2: High-Cost Asset Summary
- Table F-3: Low-Cost Asset Summary
- Table F-4: Asset Cost Summary
- Table F-5: 2023-2047 DIRP Summary
- Table F-6: Master Plan Upgrades Cost Summary

Table F-1: Block Scoring Evaluation Summary

AE Block Number	Street ID	Block Watermain Score	Block Sanitary Sewer Score	Block Storm Sewer Score
1	R51a52As53s	74		
2	R51a52s52As	50		
3	R51a51s52s	62		
4	R51a50s51s	87		
5	R51a49s50s	46	51	
6	R51a48s49s	73	61	
7	R51a47s48s	71	26	21
8	R51a46s47s		79	
9	R50a52As53s	11	40	
10	R50a52s52As		57	63
11	R50a51s52s	50	61	48
12	R50a50s51s		88	80
13	R50a49s50s			72
14	R50a48s49s			51
15	R50a47s48s	15	7	30
16	R50a46s47s	35		
17	R49a52s52As	31	61	
18	R49a51s52s	31	65	40
19	R49a50s51s	31	92	48
20	R49a49s50s	31	92	30
21	R49a48s50s	31	92	31
22	R49a47s48s	25	87	
23	R49a46s47s	31	88	
24	R48Aa52As53s	26	12	50
25	R48Aa52s52As		16	51
26	R48Aa51s52s		79	77
27	R48Aa50s51s	50	79	72
28	R48Aa49s50s			26
29	R48Aa48s49s	50		
30	R48al46s47s	57	48	30
31	R53s50a51a	51	41	36
32	R53s49a50a	51	41	36
33	R53s48Aa49a	51		35
34	R52As50a51a	27	60	
35	R52As49a50a	26	61	
36	R52As48Aa49a	26	61	3
37	R52s50a51a	67	41	
38	R52s49a50a	20	88	46
39	R52s48Aa49a	20	92	46
40	R52s48a48Aa	27	102	50
41	R51s50a51a	31	61	
42	R51s49a50a	28		71
43	R51s48Aa49a	26	46	
44	R51s48a48Aa	20	22	32
45	R50al50a51a		66	
46	R50al49a50a		66	56
47	R50s50a51a	53	88	
48	R50s49a50a	38	88	57
49	R50s48Aa49a	36	92	51
50	R50s48a48Aa	62	92	
51	R49al50a51a		46	
52	R49al49a50a		46	
53	R49al48Aa49a		41	19
54	R49s50a51a	26	88	
55	R49s49a50a	70	88	49
56	R49s48Aa49a	19	22	26
57	R49s48a48Aa	19	22	
58	R48s50a51a	69	69	52
59	R48s49a50a	69	88	
60	R48s48Aa49a			
61	R48s48a48Aa			
62	R47s50a51a	55	22	
63	R47s49a50a	55	61	
64	R47s48a49a	29	26	11
65	R46s50a51a			
66	R50a45s46s	24	68	
67	R46s49a50a	18	41	
68	R46s48a49a	69	41	21

Table F-2: High-Cost Asset Summary

AE Block Number	Street ID	Sidewalk Rehabilitation		Roadway Rehabilitation			Watermains Rehabilitation					Sanitary Sewers Rehabilitation					Storm Sewers Rehabilitation					Total Factored Utility Score	Block Priority Level	Total Factored Block Score	Total Block Infrastructure High-Cost
		Treatment	Sidewalk Score	Road Length (m)	High-Cost Treatment	Block Roadway Score	Length (m)	Diameter (mm)	High-Cost Treatment	Block Watermain Score	Total Block Water High-Cost	Length (m)	Diameter (mm)	High-Cost Treatment	Block Sanitary Sewer Score	Total Block Sanitary High-Cost	Length (m)	Diameter (mm)	High-Cost Treatment	Block Storm Sewer Score	Total Block Storm High-Cost				
55	R49s49a50a	Rehabilitation Program	5				170	300	R&R + Upsize Line (MP)	70	$ 179,000	174	200	R&R	88	$ 134,000	78	600	R&R	49	$ 137,000	326	Priority 1	32600	$ 450,000
27	R48Aa50s51s	Maintenance Program	1	104	Mill and Fill 50 mm	10	105	300	Install New Line (MP)	50	$ 110,000	54	375	R&R	79	$ 60,000	62 106	600 900	R&R	72	$ 405,000	302	Priority 1	30150	$ 575,000
59	R48s49a50a	Rehabilitation Program	5				173	200	R&R	69	$ 133,000	173	200	R&R	88	$ 133,000			NA			275	Priority 1	27500	$ 266,000
40	R52s48a48Aa	Maintenance Program	1				139 148	150 200	R&R	27	$ 211,000	83 138	300 375	R&R	102	$ 230,000	110	900	Install New Line (MP)	50	$ 308,000	258	Priority 1	25800	$ 749,000
11	R50a51s52s	Maintenance Program	1						NA	50		99	200	R&R	61	$ 76,000	102	450	R&R	48	$ 129,000	241	Priority 1	24050	$ 205,000
47	R50s50a51a	Maintenance Program	1				168	200	R&R	53	$ 129,000	173	200 200	R&R	88	$ 133,000			NA			239	Priority 1	23900	$ 262,000
21	R49a48s50s	Maintenance Program	1				93	250	R&R	31	$ 85,000	100 100	250 375	R&R	92	$ 194,000	105	unk	Address Surcharging (MP)	31	$ 450,000	232	Priority 1	23200	$ 729,000
68	R46s48a49a	Rehabilitation Program	5				158 62	200 250	R&R	69	$ 178,000	231	200	R&R	41	$ 178,000	29	300	R&R	21	$ 26,000	226	Priority 1	22550	$ 382,000
12	R50a50s51s	Rehabilitation Program	5	104	Full Depth Mill	1			NA			56	200	R&R	88	$ 43,000	86 89	300 750	R&R, Address Surcharging (MP)	80	$ 753,000	218	Priority 1	21800	$ 796,000
37	R52s50a51a	Replace Asset	10	172	Mill and Fill 50 mm	1	107 53	150 200	R&R	67	$ 116,000	172	200	R&R	41	$ 132,000			NA			207	Priority 1	20650	$ 248,000
32	R53s49a50a	Maintenance Program	1	172	Mill and Fill 50 mm	5	173	350	R&R	51	$ 205,000	173	200	R&R	41	$ 133,000	168	450	R&R, Address Surcharging (MP)	36	$ 662,000	206	Priority 1	20550	$ 1,000,000
7	R51a47s48s	Do Nil / Field Inspection					91	150	R&R	71	$ 70,000	111	250	R&R	26	$ 93,000	20	300	R&R, Address Surcharging (MP)	21	$ 468,000	202	Priority 1	20200	$ 631,000
31	R53s50a51a	Maintenance Program	1	173	Mill and Fill 50 mm	1	167	350	R&R	51	$ 198,000	173	200	R&R	41	$ 133,000	36 144	375 450	R&R, Address Surcharging (MP)	36	$ 672,000	202	Priority 1	20150	$ 1,003,000
23	R49a46s47s	Maintenance Program	1				125	250	R&R	31	$ 114,000	131	200	R&R	88	$ 101,000			NA			195	Priority 1	19500	$ 215,000
54	R49s50a51a	Replace Asset	10				180	200	R&R	26	$ 138,000	170	200	R&R	88	$ 131,000			NA			194	Priority 1	19400	$ 269,000
5	R51a49s50s	Replace Asset	10				111	200	R&R	46	$ 86,000	104	200	R&R	51	$ 80,000			NA			179	Priority 1	17850	$ 166,000
41	R51s50a51a	Maintenance Program	1	171	Full Depth Mill	1	170	300	R&R + Upsize Line (MP)	31	$ 179,000	74	200	R&R	61	$ 57,000			NA			156	Priority 1	15550	$ 236,000
17	R49s52s52As	Maintenance Program	1				105	250	R&R	31	$ 96,000	99	200	R&R	61	$ 76,000			NA			155	Priority 1	15450	$ 172,000
10	R50a52s52As	Rehabilitation Program	5						NA			99	200	R&R	57	$ 76,000	94	300	R&R, Address Surcharging (MP)	63	$ 536,000	154	Priority 1	15350	$ 612,000
1	R51a52As53s	Rehabilitation Program	5				27 110	150 300	R&R + Install New Line (MP)	74	$ 204,000			NA					NA			153	Priority 1	15300	$ 204,000
66	R50a45s46s						114	150	R&R	24	$ 79,000	109	200	R&R	68	$ 84,000			NA			150	Priority 1	15000	$ 163,000
35	R52As49a50a	Maintenance Program	1				172	200	R&R	26	$ 132,000	172	200 200	R&R	61	$ 58,000			NA			145	Priority 1	14450	$ 190,000
62	R47s50a51a	Do Nil / Field Inspection					167	200	R&R	55	$ 128,000	117	200	R&R	22	$ 90,000			NA			143	Priority 1	14300	$ 218,000
42	R51s49a50a	Maintenance Program	1	173	Mill and Fill 50 mm	10	167	300	R&R + Upsize Line (MP)	28	$ 175,000						84 170	375 750	R&R, Address Surcharging (MP)	71	$ 988,000	138	Priority 1	13800	$ 1,163,000
2	R51s52s52As	Rehabilitation Program	5	100	Full Depth Mill	1	100	300	Install New Line (MP)	50	$ 105,000			NA					NA			106	Priority 1	10600	$ 105,000
29	R48Aa48s49s	Maintenance Program	1				100	300	Install New Line (MP)	50	$ 105,000			NA					NA			101	Priority 1	10100	$ 105,000
52	R49al49a50a								NA			173	250 250	R&R	46	$ 145,000			NA			69	Priority 1	6900	$ 145,000
51	R49al50a51a								NA			117	250	R&R	46	$ 98,000			NA			69	Priority 1	6900	$ 98,000
48	R50s49a50a	Maintenance Program	1				171	200	R&R	38	$ 132,000	173	200 200	R&R	88	$ 61,000	13 170	600 1050	R&R	57	$ 546,000	266	Priority 2	5320	$ 739,000
38	R52s49a50a	Rehabilitation Program	5				181	200	R&R	20	$ 139,000	173	200	R&R	88	$ 133,000	160	900	R&R	46	$ 448,000	223	Priority 2	4460	$ 720,000
30	R48al46s47s						52	50	R&R	57	$ 29,000	64	200	R&R	48	$ 49,000	156	300	R&R	30	$ 142,000	216	Priority 2	4320	$ 220,000
63	R47s49a50a	Maintenance Program	1				173	200	R&R	55	$ 133,000	103	200	R&R	61	$ 79,000			NA			203	Priority 2	4050	$ 212,000
36	R52As48Aa49a	Maintenance Program	1	172	Mill and Fill 50 mm	10	180	200	R&R	26	$ 139,000	171	200 200	R&R	61	$ 132,000	60	250	R&R	3	$ 50,000	158	Priority 2	3150	$ 321,000
46	R50al49a50a								NA			173	250	R&R	66	$ 145,000	87 75	300 450	R&R	56	$ 174,000	155	Priority 2	3100	$ 319,000
44	R51s48a48Aa	Rehabilitation Program	5	139	Full Depth Mill	10	57 84	300	R&R + Upsize Line (MP)	20	$ 227,000	83	200	R&R	22	$ 64,000	67	375	R&R	32	$ 75,000	120	Priority 2	2400	$ 366,000
45	R50al50a51a								NA			120	250	R&R	66	$ 101,000			NA			99	Priority 2	1980	$ 101,000
67	R46s49a50a	Maintenance Program	1	66	Mill and Fill 50 mm	20	126	150	R&R	18	$ 88,000	128	200	R&R	41	$ 99,000			NA			99	Priority 2	1970	$ 187,000
56	R49s48Aa49a	Maintenance Program	1				175	300	R&R + Upsize Line (MP)	19	$ 184,000	176	200	R&R	22	$ 135,000	173	600	R&R	26	$ 303,000	98	Priority 2	1960	$ 622,000
58	R48s50a51a	Rehabilitation Program	5				167	200	R&R	69	$ 129,000	133 35	250 300	R&R	69	$ 144,000	49 119	400 450	R&R	52	$ 208,000	299	Unknown	1493	$ 481,000
57	R49s48a48Aa	Do Nil / Field Inspection					120	300	R&R + Upsize Line (MP)	19	$ 126,000	86	200	R&R	22	$ 66,000			NA			71	Priority 2	1420	$ 192,000
50	R50s48a48Aa	Maintenance Program	1				125	200	R&R	62	$ 96,000	111	250	R&R	92	$ 93,000			NA			263	Unknown	1315	$ 189,000
49	R50s48Aa49a	Maintenance Program	1				165	200	R&R	36	$ 127,000	173	250	R&R	92	$ 145,000	167	1050	R&R	51	$ 514,000	262	Unknown	1310	$ 786,000
19	R49a50s51s	Maintenance Program	1				94	250	R&R	31	$ 85,000	105 105	250 375	R&R	92	$ 204,000	110	450	R&R	48	$ 139,000	249	Unknown	1245	$ 428,000
20	R49a49s50s	Maintenance Program	1				112	250	R&R	31	$ 101,000	105 105	250 375	R&R	92	$ 205,000	88	300	R&R	30	$ 80,000	231	Unknown	1155	$ 386,000
39	R52s48Aa49a	Maintenance Program	1	172	Full Reconstruction	5	176	200	R&R	20	$ 136,000	169	250	R&R	92	$ 142,000	170	900	R&R	46	$ 476,000	230	Unknown	1150	$ 754,000
26	R48Aa51s52s	Maintenance Program	1	99	Mill and Fill 50 mm	20			NA			97	375	R&R	79	$ 109,000	50 44	900 1050	R&R	77	$ 276,000	217	Unknown	1083	$ 385,000
18	R49a51s52s	Maintenance Program	1				93	250	R&R	31	$ 84,000	99	250	R&R	65	$ 83,000	54 57	450 750	R&R	40	$ 212,000	201	Unknown	1003	$ 379,000
22	R49a47s48s	Maintenance Program	1				112	250	R&R	25	$ 102,000	112	200	R&R	87	$ 86,000			NA			182	Unknown	908	$ 188,000
4	R51a50s51s	Maintenance Program	1				103	200	R&R	87	$ 79,000			NA					NA			175	Unknown	875	$ 79,000
34	R52As50a51a	Rehabilitation Program	5	172	Full Reconstruction	5	162	150	R&R	27	$ 114,000	173	200	R&R	60	$ 133,000			NA			154	Unknown	770	$ 247,000
24	R48Aa52As53s			40	Mill and Fill 50 mm	20	41	200	R&R	26	$ 31,000	30	250	R&R	12	$ 25,000	926	600 1050	R&R	50	$ 96,000	140	Unknown	700	$ 152,000
33	R53s48Aa49a	Maintenance Program	1	176	Mill and Fill 50 mm	1	181	350	R&R	51	$ 216,000			NA			182	450	R&R	35	$ 229,000	139	Unknown	695	$ 445,000
43	R51s48Aa49a	Maintenance Program	1	172	Mill and Fill 50 mm	10	15 153	150 200	R&R	26	$ 128,000	168	375	R&R	46	$ 194,000			NA			132	Unknown	660	$ 322,000
3	R51a51s52s	Maintenance Program	1				102	200	R&R	62	$ 79,000			NA					NA			125	Unknown	625	$ 79,000
64	R47s48a49a	Replace Asset	10	246	Full Reconstruction	5	239	200	R&R	29	$ 184,000	232	200	R&R	26	$ 179,000	17	300	R&R	11	$ 15,000	123	Unknown	615	$ 378,000
8	R51a46s47s	Do Nil / Field Inspection					111	300	NA			165	250	R&R	79	$ 138,000			NA			119	Unknown	593	$ 138,000
6	R51a48s49s	Replace Asset	10				112	100	R&R	73	$ 64,000	100	200	R&R	61	$ 77,000			NA			248	Priority 3	495	$ 141,000
25	R48Aa52s52As			104	Mill and Fill 50 mm	20			NA			16	250	R&R	16	$ 13,000	100	1050	R&R	51	$ 308,000	95	Unknown	475	$ 321,000
13	R50a49s50s	Replace Asset	10	105	Mill and Fill 50 mm	10			NA					NA			101	900	R&R	72	$ 283,000	92	Unknown	460	$ 283,000
9	R50a52As53s	Maintenance Program	1				92	150	R&R	11	$ 64,000	60	200	R&R	40	$ 46,000			NA			83	Unknown	415	$ 110,000
15	R50a47s48s	Maintenance Program	1				112	250	R&R	15	$ 102,000	115	200	R&R	7	$ 89,000	111	unk	NA	30		72	Unknown	358	$ 191,000
16	R50a46s47s	Maintenance Program	1				87	100	R&R	35	$ 53,000			NA					NA			71	Unknown	355	$ 53,000
14	R50a48s49s			99	Full Depth Mill	1			NA					NA			97	900	R&R	51	$ 272,000	52	Unknown	260	$ 272,000
53	R49al48Aa49a								NA			32	200	R&R	41	$ 25,000	76	150	R&R	19	$ 53,000	81	Priority 3	161	$ 78,000
28	R48Aa49s50s	Maintenance Program	1						NA					NA			97	600	R&R	26	$ 170,000	27	Unknown	135	$ 170,000
65	R46s50a51a			164	Overlay 50 mm	20			NA					NA					NA			20	Unknown	100	$ -
61	R48s48a48Aa	Maintenance Program	1						NA					NA					NA			1	Unknown	5	$ -
60	R48s48Aa49a	Do Nil / Field Inspection							NA					NA					NA			0	Unknown	0	$ -
		Total:									**$ 6,326,000**					**$ 5,862,000**					**$ 10,603,000**				**$ 22,791,000**

*Costs shown are construction costs

Table F-3: Low-Cost Asset Summary

AE Block Number	Street ID	Sidewalk Rehabilitation		Roadway Rehabilitation			Watermains Rehabilitation					Sanitary Sewers Rehabilitation					Storm Sewers Rehabilitation							
		Treatment	Sidewalk Score	Road Length (m)	Low-Cost Treatment	Block Roadway Score	Length (m)	Diameter (mm)	Low-Cost Treatment	Block Watermain Score	Total Block Water Low-Cost	Length (m)	Diameter (mm)	Low-Cost Treatment	Block Sanitary Sewer Score	Total Block Sanitary Low-Cost	Length (m)	Diameter (mm)	Low-Cost Treatment	Block Storm Sewer Score	Total Block Storm Low-Cost	Total Factored Utility Score	Block Priority Level	Total Factored Block Score	Total Block Infrastructure Low-Cost
55	R49s49a50a	Rehabilitation Program	5				170	300	R&R + Upsize Line (MP)	70	$ 179,000.00	174	200	R&R	88	$ 134,000.00	78	600	R&R	49	$ 137,000.00	326	Priority 1	32600	$ 450,000
27	R48Aa50s51s	Maintenance Program	1	104	Mill and Fill 50 mm	10	105	300	Install New Line (MP)	50	$ 110,000.00	54	375	R&R	79	$ 60,000.00	62 106	600 900	R&R	72	$ 405,000.00	302	Priority 1	30150	$ 575,000
59	R48s49a50a	Rehabilitation Program	5				173	200	R&R	69	$ 133,000.00	173	200	R&R	88	$ 133,000.00			NA			275	Priority 1	27500	$ 266,000
40	R52s48a48Aa	Maintenance Program	1				139 148	150 200	R&R	27	$ 211,000.00	83 138	300 375	R&R	102	$ 230,000.00	110	900	Install New Line (MP)	50	$ 308,000.00	258	Priority 1	25800	$ 749,000
11	R50a51s52s	Maintenance Program	1						NA	50		99	200	Flush and Camera, Spot Repair Liner	61	$ 9,000.00	102	450	NIL	48		241	Priority 1	24050	$ 9,000
47	R50s50a51a	Maintenance Program	1				168	200	R&R	53	$ 129,000.00	173	200 200	R&R	88	$ 133,000.00			NA			239	Priority 1	23900	$ 262,000
21	R49a48s50s	Maintenance Program	1				93	250	R&R	31	$ 85,000.00	100 100	250 375	R&R	92	$ 194,000.00	105	unk	Address Surcharging (MP)	31	$ 450,000.00	232	Priority 1	23200	$ 729,000
68	R46s48a49a	Rehabilitation Program	5				158 62	200 250	R&R	69	$ 178,000.00	231	200	R&R	41	$ 178,000.00	29	300	R&R	21	$ 26,000.00	226	Priority 1	22550	$ 382,000
12	R50a50s51s	Rehabilitation Program	5	104	Full Depth Mill	1			NA			56	200	R&R	88	$ 43,000.00	86 89	300 750	R&R, Address Surcharging (MP)	80	$ 753,000.00	218	Priority 1	21800	$ 796,000
37	R52s50a51a	Replace Asset	10	172	Mill and Fill 50 mm	1	107 53	150 200	R&R	67	$ 116,000.00	172	200	R&R	41	$ 132,000.00			NA			207	Priority 1	20650	$ 248,000
32	R53s49a50a	Maintenance Program	1	172	Mill and Fill 50 mm	5	173	350	R&R	51	$ 205,000.00	173	200	R&R	41	$ 133,000.00	168	450	R&R, Address Surcharging (MP)	36	$ 662,000.00	206	Priority 1	20550	$ 1,000,000
7	R51a47s48s	Do Nil / Field Inspection					91	150	R&R	71	$ 70,000.00	111	250	R&R	26	$ 93,000.00	20	300	R&R	21	$ 468,000.00	202	Priority 1	20200	$ 631,000
31	R53s50a51a	Maintenance Program	1	173	Mill and Fill 50 mm	1	167	350	R&R	51	$ 198,000.00	173	200	R&R	41	$ 133,000.00	36 144	375 450	R&R, Address Surcharging (MP)	36	$ 672,000.00	202	Priority 1	20150	$ 1,003,000
23	R49a46s47s	Maintenance Program	1				125	250	NIL	31		131	200	Flush and Camera	88	$ 5,000.00			NA			195	Priority 1	19500	$ 5,000
54	R49s50a51a	Replace Asset	10				180	200	NIL	26		170	200	Flush and Camera, Spot Repair Excavation	88	$ 18,000.00			NA			194	Priority 1	19400	$ 18,000
5	R51a49s50s	Replace Asset	10				111	200	R&R	46	$ 86,000.00	104	200	R&R	51	$ 80,000.00			NA			179	Priority 1	17850	$ 166,000
41	R51s50a51a	Maintenance Program	1	171	Full Depth Mill	1	170	300	R&R + Upsize Line (MP)	31	$ 179,000.00	74	200	R&R	61	$ 57,000.00			NA			156	Priority 1	15550	$ 236,000
17	R49a52s52As	Maintenance Program	1				105	250	NIL	31		99	200	Full Liner	61	$ 40,000.00			NA			155	Priority 1	15450	$ 40,000
10	R50a52s52As	Rehabilitation Program	5						NA			99	200	R&R	57	$ 76,000.00	94	300	R&R, Address Surcharging (MP)	63	$ 536,000.00	154	Priority 1	15350	$ 612,000
1	R51a52As53s	Rehabilitation Program	5				27 110	150 300	R&R + Install New Line (MP)	74	$ 204,000.00			NA					NA			153	Priority 1	15300	$ 204,000
66	R50a45s46s						114	150	NIL	24		109	200	Spot Repair Excavation	68	$ 7,000.00			NA			150	Priority 1	15000	$ 7,000
35	R52As49a50a	Maintenance Program	1				172	200	NIL	26		172	200 200	Full Liner	61	$ 69,000.00			NA			145	Priority 1	14450	$ 69,000
62	R47s50a51a	Do Nil / Field Inspection					167	200	R&R	55	$ 128,000.00	117	200	R&R	22	$ 90,000.00			NA			143	Priority 1	14300	$ 218,000
42	R51s49a50a	Maintenance Program	1	173	Mill and Fill 50 mm	10	167	300	#N/A	28	$ 175,000.00						84 170	375 750	#N/A	71	$ 988,000.00	138	Priority 1	13800	$ 1,163,000
2	R51a52s52As	Rehabilitation Program	5	100	Full Depth Mill	1	100	300	Install New Line (MP)	50	$ 105,000.00			NA					NA			106	Priority 1	10600	$ 105,000
29	R48Aa48s49s	Maintenance Program	1				100	300	Install New Line (MP)	50	$ 105,000.00			NA					NA			101	Priority 1	10100	$ 105,000
52	R49a49a50a								NA			173	250 250	Mechanically Clean and Camera, Spot Repair Liner, Full Liner	46	$ 55,000.00			NA			69	Priority 1	6900	$ 55,000
51	R49a50a51a								NA			117	250	Mechanically Clean and Camera, Trim, Spot Repair Excavation	46	$ 13,000.00			NA			69	Priority 1	6900	$ 13,000
48	R50s49a50a	Maintenance Program	1				171	200	NIL	38		173	200 200	Full Liner	88	$ 36,000.00	13 170	600 1050	NIL	57		266	Priority 2	5320	$ 36,000
38	R52s49a50a	Rehabilitation Program	5				181	200	NIL	20		173	200	Full Liner	88	$ 80,000.00	160	900	NIL	46		223	Priority 2	4460	$ 80,000
30	R48a46s47s						52	50	NIL	57		64	200	Spot Repair Liner	48	$ 5,000.00	156	300	NIL	30		216	Priority 2	4320	$ 5,000
63	R47s49a50a	Maintenance Program	1				173	200	NIL	55		103	200	Full Liner	61	$ 41,000.00			NA			203	Priority 2	4050	$ 41,000
36	R52As48Aa49a	Maintenance Program	1	172	Mill and Fill 50 mm	10	180	200	NIL	26		171	200 200	Spot Repair Liner	61	$ 22,000.00	60	250	NIL	3		158	Priority 2	3150	$ 22,000
46	R50a49a50a								NA			173	250	Mechanically Clean and Camera	66	$ 8,000.00	87 75	300 450	NIL	56		155	Priority 2	3100	$ 8,000
44	R51s48a48Aa	Rehabilitation Program	5	139	Full Depth Mill	10	57 84	300	R&R + Upsize Line (MP)	20	$ 227,000.00	83	200	R&R	22	$ 64,000.00	67	375	NA	32	$ 75,000.00	120	Priority 2	2400	$ 366,000
45	R50a50a51a								NA			120	250	Mechanically Clean and Camera	66	$ 6,000.00			NA			99	Priority 2	1980	$ 6,000
67	R46s49a50a	Maintenance Program	1	66	Mill and Fill 50 mm	20	126	150	#N/A	18		128	200	Flush and Camera, Spot Repair Liner	41	$ 16,000.00			#N/A			99	Priority 2	1970	$ 16,000
56	R49s48Aa49a	Maintenance Program	1				175	300	R&R + Upsize Line (MP)	19	$ 184,000.00	176	200	R&R	22	$ 135,000.00	173	600	R&R	26	$ 303,000.00	98	Priority 2	1960	$ 622,000
58	R48s50a51a	Rehabilitation Program	5				167	200	NIL	69		133 35	250 300	NIL	69		49 119	400 450	NIL	52		299	Unknown	1493	$ -
57	R49s48a48Aa	Do Nil / Field Inspection					120	300	R&R + Upsize Line (MP)	19	$ 126,000.00	86	200	R&R	22	$ 66,000.00			NA			71	Priority 2	1420	$ 192,000
50	R50s48a48Aa	Maintenance Program	1				125	200	NIL	62		111	250	NIL	92				NA			263	Unknown	1315	$ -
49	R50s48Aa49a	Maintenance Program	1				165	200	NIL	36		173	250	NIL	92		167	1050	NIL	51		262	Unknown	1310	$ -
19	R49a50s51s	Maintenance Program	1				94	250	NIL	31		105 105	250 375	NIL	92		110	450	NIL	48		249	Unknown	1245	$ -
20	R49a49s50s	Maintenance Program	1				112	250	NIL	31		105 105	250 375	NIL	92		88	300	NIL	30		231	Unknown	1155	$ -
39	R52s48Aa49a	Maintenance Program	1	172	Full Reconstruction	5	176	200	NIL	20		169	250	NIL	92		170	900	NIL	46		230	Unknown	1150	$ -
26	R48Aa51s52s	Maintenance Program	1	99	Mill and Fill 50 mm	20			NA			97	375	NIL	79		50 44	900 1050	NIL	77		217	Unknown	1083	$ -
18	R49a51s52s	Maintenance Program	1				93	250	NIL	31		99	250	NIL	65		54 57	450 750	NIL	40		201	Unknown	1003	$ -
22	R49a47s48s	Maintenance Program	1				112	250	NIL	25		112	200	NIL	87				NA			182	Unknown	908	$ -
4	R51a50s51s	Maintenance Program	1				103	200	NIL	87				NA					NA			175	Unknown	875	$ -
34	R52As50a51a	Rehabilitation Program	5	172	Full Reconstruction	5	162	150	NIL	27		173	200	NIL	60				NA			154	Unknown	770	$ -
24	R48Aa52As53s			40	Mill and Fill 50 mm	20	41	200	NIL	26		30	250	NIL	12		926	600 1050	NIL	50		140	Unknown	700	$ -
33	R53s48Aa49a	Maintenance Program	1	176	Mill and Fill 50 mm	1	181	350	NIL	51				NA			182	450	NIL	35		139	Unknown	695	$ -
43	R51s48Aa49a	Maintenance Program	1	172	Mill and Fill 50 mm	10	15 153	150 200	NIL	26		168	375	NA	46				NA			132	Unknown	660	$ -
3	R51a51s52s	Maintenance Program	1				102	200	#N/A	62				NA					#N/A			125	Unknown	625	$ -
64	R47s48a49a	Replace Asset	10	246	Full Reconstruction	5	239	200	#N/A	29		232	200	NIL	26		17	300	#N/A	11		123	Unknown	615	$ -
8	R51a46s47s	Do Nil / Field Inspection					111	300	#N/A			165	250	NIL	79				#N/A			119	Unknown	593	$ -
6	R51a48s49s	Replace Asset	10				112	100	#N/A	73		100	200	Flush and Camera	61	$ 4,000.00			#N/A			248	Priority 3	495	$ 4,000
25	R48Aa52s52As			104	Mill and Fill 50 mm	20			#N/A			16	250	NIL	16		100	1050	#N/A	51		95	Unknown	475	$ -
13	R50a49s50s	Replace Asset	10	105	Mill and Fill 50 mm	10			#N/A					NA			101	900	#N/A	72		92	Unknown	460	$ -
9	R50a52As53s	Maintenance Program	1				92	150	#N/A	11		60	200	NIL	40				#N/A			83	Unknown	415	$ -
15	R50a47s48s	Maintenance Program	1				112	250	NIL	15		115	200	NIL	7		111	unk	NA	30		72	Unknown	358	$ -
16	R50a46s47s	Maintenance Program	1				87	100	NIL	35				NA					NA			71	Unknown	355	$ -
14	R50a48s49s			99	Full Depth Mill	1			NA					NA			97	900	NIL	51		52	Unknown	260	$ -
53	R49a48Aa49a								NA			32	200	Flush and Camera	41	$ 2,000.00	76	150	NIL	19		81	Priority 3	161	$ 2,000
28	R48Aa49s50s	Maintenance Program	1						NA					NA			97	600	NIL	26		27	Unknown	135	$ -
65	R46s50a51a			164	Overlay 50 mm	20			NA					NA					NA			20	Unknown	100	$ -
61	R48s48a48Aa	Maintenance Program	1						NA					NA					NA			1	Unknown	5	$ -
60	R48s48Aa49a	Do Nil / Field Inspection							NA					NA					NA			0	Unknown	0	$ -
		Total:									**$ 3,133,000**					**$ 2,600,000**					**$ 5,783,000**				**$ 11,516,000**

*Costs shown are construction costs

Table F-4: Asset Cost Summary

AE Block Number	Street ID	Sidewalk Rehabilitation	Roadway Rehabilitation		Watermains Rehabilitation					Sanitary Sewers Rehabilitation					Storm Sewers Rehabilitation					Total Factored Utility Score	Block Priority Level	Total Factored Block Score	Total Block Infrastructure High-Cost	Total Block Infrastructure Low-Cost
		Sidewalk Score	Road Length (m)	Block Roadway Score	Length (m)	Diameter (mm)	Block Watermain Score	Total Block Water High-Cost	Total Block Water Low-Cost	Length (m)	Diameter (mm)	Block Sanitary Sewer Score	Total Block Sanitary High-Cost	Total Block Sanitary Low-Cost	Length (m)	Diameter (mm)	Block Storm Sewer Score	Total Block Storm High-Cost	Total Block Storm Low-Cost					
55	R49s49a50a	5			170	300	70	$ 179,000	$ 179,000.00	174	200	88	$ 134,000	$ 134,000.00	78	600	49	$ 137,000	$ 137,000.00	326	Priority 1	32600	$ 450,000	$ 450,000
27	R48Aa50s51s	1	104	10	105	300	50	$ 110,000	$ 110,000.00	54	375	79	$ 60,000	$ 60,000.00	62 106	600 900	72	$ 405,000	$ 405,000.00	302	Priority 1	30150	$ 575,000	$ 575,000
59	R48s49a50a	5			173	200	69	$ 133,000	$ 133,000.00	173	200	88	$ 133,000	$ 133,000.00						275	Priority 1	27500	$ 266,000	$ 266,000
40	R52s48a48Aa	1			139 148	150 200	27	$ 211,000	$ 211,000.00	83 138	300 375	102	$ 230,000	$ 230,000.00	110	900	50	$ 308,000	$ 308,000.00	258	Priority 1	25800	$ 749,000	$ 749,000
11	R50s51s52s	1					50			99	200	61	$ 76,000	$ 9,000.00	102	450	48	$ 129,000		241	Priority 1	24050	$ 205,000	$ 9,000
47	R50s50a51a	1			168	200	53	$ 129,000	$ 129,000.00	173	200 200	88	$ 133,000	$ 133,000.00						239	Priority 1	23900	$ 262,000	$ 262,000
21	R49a48s50s	1			93	250	31	$ 85,000	$ 85,000.00	100 100	250 375	92	$ 194,000	$ 194,000.00	105	unk	31	$ 450,000	$ 450,000.00	232	Priority 1	23200	$ 729,000	$ 729,000
68	R46s48a49a	5			158 62	200 250	69	$ 178,000	$ 178,000.00	231	200	41	$ 178,000	$ 178,000.00	29	300	21	$ 26,000	$ 26,000.00	226	Priority 1	22550	$ 382,000	$ 382,000
12	R50a50s51s	5	104	1						56	200	88	$ 43,000	$ 43,000.00	86 89	300 750	80	$ 753,000	$ 753,000.00	218	Priority 1	21800	$ 796,000	$ 796,000
37	R52s50a51a	10	172	1	107 53	150 200	67	$ 116,000	$ 116,000.00	172	200	41	$ 132,000	$ 132,000.00						207	Priority 1	20650	$ 248,000	$ 248,000
32	R53s49a50a	1	172	5	173	350	51	$ 205,000	$ 205,000.00	173	200	41	$ 133,000	$ 133,000.00	168	450	36	$ 662,000	$ 662,000.00	206	Priority 1	20550	$ 1,000,000	$ 1,000,000
7	R51a47s48s				91	150	71	$ 70,000	$ 70,000.00	111	250	26	$ 93,000	$ 93,000.00	20	300	21	$ 468,000	$ 468,000.00	202	Priority 1	20200	$ 631,000	$ 631,000
31	R53s50a51a	1	173	1	167	350	51	$ 198,000	$ 198,000.00	173	200	41	$ 133,000	$ 133,000.00	36 144	375 450	36	$ 672,000	$ 672,000.00	202	Priority 1	20150	$ 1,003,000	$ 1,003,000
23	R49a46s47s	1			125	250	31	$ 114,000		131	200	88	$ 101,000	$ 5,000.00						195	Priority 1	19500	$ 215,000	$ 5,000
54	R49s50a51a	10			180	200	26	$ 138,000		170	200	88	$ 131,000	$ 18,000.00						194	Priority 1	19400	$ 269,000	$ 18,000
5	R51a49s50s	10			111	200	46	$ 86,000	$ 86,000.00	104	200	51	$ 80,000	$ 80,000.00						179	Priority 1	17850	$ 166,000	$ 166,000
41	R51s50a51a	1	171	1	170	300	31	$ 179,000	$ 179,000.00	74	200	61	$ 57,000	$ 57,000.00						156	Priority 1	15550	$ 236,000	$ 236,000
17	R49a52s52As	1			105	250	31	$ 96,000		99	200	61	$ 76,000	$ 40,000.00						155	Priority 1	15450	$ 172,000	$ 40,000
10	R50a52s52As	5								99	200	57	$ 76,000	$ 76,000.00	94	300	63	$ 536,000	$ 536,000.00	154	Priority 1	15350	$ 612,000	$ 612,000
1	R51a52As53s	5			27 110	150 300	74	$ 204,000	$ 204,000.00											153	Priority 1	15300	$ 204,000	$ 204,000
66	R50a45s46s				114	150	24	$ 79,000		109	200	68	$ 84,000	$ 7,000.00						150	Priority 1	15000	$ 163,000	$ 7,000
35	R52As49a50a	1			172	200	26	$ 132,000		172	200 200	61	$ 58,000	$ 69,000.00						145	Priority 1	14450	$ 190,000	$ 69,000
62	R47s50a51a				167	200	55	$ 128,000	$ 128,000.00	117	200	22	$ 90,000	$ 90,000.00						143	Priority 1	14300	$ 218,000	$ 218,000
42	R51s49a50a	1	173	10	167	300	28	$ 175,000	$ 175,000.00						84 170	375 750	71	$ 988,000	$ 988,000.00	138	Priority 1	13800	$ 1,163,000	$ 1,163,000
2	R51a52s52As	5	100	1	100	300	50	$ 105,000	$ 105,000.00											106	Priority 1	10600	$ 105,000	$ 105,000
29	R48Aa48s49s	1			100	300	50	$ 105,000	$ 105,000.00											101	Priority 1	10100	$ 105,000	$ 105,000
52	R49s49a50a									173	250 250	46	$ 145,000	$ 55,000.00						69	Priority 1	6900	$ 145,000	$ 55,000
51	R49s50a51a									117	250	46	$ 98,000	$ 13,000.00						69	Priority 1	6900	$ 98,000	$ 13,000
48	R50s49a50a	1			171	200	38	$ 132,000		173	200 200	88	$ 61,000	$ 36,000.00	13 170	600 1050	57	$ 546,000		266	Priority 2	5320	$ 739,000	$ 36,000
38	R52s49a50a	5			181	200	20	$ 139,000		173	200	88	$ 133,000	$ 80,000.00	160	900	46	$ 448,000		223	Priority 2	4460	$ 720,000	$ 80,000
30	R48a46s47s				52	50	57	$ 29,000		64	200	48	$ 49,000	$ 5,000.00	156	300	30	$ 142,000		216	Priority 2	4320	$ 220,000	$ 5,000
63	R47s49a50a	1			173	200	55	$ 133,000		103	200	61	$ 79,000	$ 41,000.00						203	Priority 2	4050	$ 212,000	$ 41,000
36	R52As48Aa49a	1	172	10	180	200	26	$ 139,000		171	200 200	61	$ 132,000	$ 22,000.00	60	250	3	$ 50,000		158	Priority 2	3150	$ 321,000	$ 22,000
46	R50a49s50a									173	250	66	$ 145,000	$ 8,000.00	87 75	300 450	56	$ 174,000		155	Priority 2	3100	$ 319,000	$ 8,000
44	R51s48a48Aa	5	139	10	57 84	300	20	$ 227,000	$ 227,000.00	83	200	22	$ 64,000	$ 64,000.00	67	375	32	$ 75,000	$ 75,000.00	120	Priority 2	2400	$ 366,000	$ 366,000
45	R50a50a51a									120	250	66	$ 101,000	$ 6,000.00						99	Priority 2	1980	$ 101,000	$ 6,000
67	R46s49a50a	1	66	20	126	150	18	$ 88,000		128	200	41	$ 99,000	$ 16,000.00						99	Priority 2	1970	$ 187,000	$ 16,000
56	R49s48Aa49a	1			175	300	19	$ 184,000	$ 184,000.00	176	200	22	$ 135,000	$ 135,000.00	173	600	26	$ 303,000	$ 303,000.00	98	Priority 2	1960	$ 622,000	$ 622,000
58	R48s50a51a	5			167	200	69	$ 129,000		133 35	250 300	69	$ 144,000		49 119	400 450	52	$ 208,000		299	Unknown	1493	$ 481,000	$ -
57	R49s48a48Aa				120	300	19	$ 126,000	$ 126,000.00	86	200	22	$ 66,000	$ 66,000.00						71	Priority 2	1420	$ 192,000	$ 192,000
50	R50s48a48Aa	1			125	200	62	$ 96,000		111	250	92	$ 93,000							263	Unknown	1315	$ 189,000	$ -
49	R50s48Aa49a	1			165	200	36	$ 127,000		173	250	92	$ 145,000		167	1050	51	$ 514,000		262	Unknown	1310	$ 786,000	$ -
19	R49s50s51s	1			94	250	31	$ 85,000		105 105	250 375	92	$ 204,000		110	450	48	$ 139,000		249	Unknown	1245	$ 428,000	$ -
20	R49a49s50s	1			112	250	31	$ 101,000		105 105	250 375	92	$ 205,000		88	300	30	$ 80,000		231	Unknown	1155	$ 386,000	$ -
39	R52s48Aa49a	1	172	5	176	200	20	$ 136,000		169	250	92	$ 142,000		170	900	46	$ 476,000		230	Unknown	1150	$ 754,000	$ -
26	R48Aa51s52s	1	99	20						97	375	79	$ 109,000		50 44	900 1050	77	$ 276,000		217	Unknown	1083	$ 385,000	$ -
18	R49s51s52s	1			93	250	31	$ 84,000		99	250	65	$ 83,000		54 57	450 750	40	$ 212,000		201	Unknown	1003	$ 379,000	$ -
22	R49a47s48s	1			112	250	25	$ 102,000		112	200	87	$ 86,000							182	Unknown	908	$ 188,000	$ -
4	R51a50s51s	1			103	200	87	$ 79,000												175	Unknown	875	$ 79,000	$ -
34	R52As50a51a	5	172	5	162	150	27	$ 114,000		173	200	60	$ 133,000							154	Unknown	770	$ 247,000	$ -
24	R48Aa52As53s		40	20	41	200	26	$ 31,000		30	250	12	$ 25,000		926	600 1050	50	$ 96,000		140	Unknown	700	$ 152,000	$ -
33	R53s48Aa49a	1	176	1	181	350	51	$ 216,000							182	450	35	$ 229,000		139	Unknown	695	$ 445,000	$ -
43	R51s48Aa49a	1	172	10	15 153	150 200	26	$ 128,000		168	375	46	$ 194,000							132	Unknown	660	$ 322,000	$ -
3	R51a51s52s	1			102	200	62	$ 79,000												125	Unknown	625	$ 79,000	$ -
64	R47s48a49a	10	246	5	239	200	29	$ 184,000		232	200	26	$ 179,000		17	300	11	$ 15,000		123	Unknown	615	$ 378,000	$ -
8	R51a46s47s				111	300				165	250	79	$ 138,000							119	Unknown	593	$ 138,000	$ -
6	R51a48s49s	10			112	100	73	$ 64,000		100	200	61	$ 77,000	$ 4,000.00						248	Priority 3	495	$ 141,000	$ 4,000
25	R48Aa52s52As		104	20						16	250	16	$ 13,000		100	1050	51	$ 308,000		95	Unknown	475	$ 321,000	$ -
13	R50a49s50s	10	105	10											101	900	72	$ 283,000		92	Unknown	460	$ 283,000	$ -
9	R50a52As53s	1			92	150	11	$ 64,000		60	200	40	$ 46,000							83	Unknown	415	$ 110,000	$ -
15	R50a47s48s	1			112	250	15	$ 102,000		115	200	7	$ 89,000		111	unk	30			72	Unknown	358	$ 191,000	$ -
16	R50a46s47s	1			87	100	35	$ 53,000												71	Unknown	355	$ 53,000	$ -
14	R50a48s49s		99	1											97	900	51	$ 272,000		52	Unknown	260	$ 272,000	$ -
53	R49a48Aa49a									32	200	41	$ 25,000	$ 2,000.00	76	150	19	$ 53,000		81	Priority 3	161	$ 78,000	$ 2,000
28	R48Aa49s50s	1													97	600	26	$ 170,000		27	Unknown	135	$ 170,000	$ -
65	R46s50a51a		164	20																20	Unknown	100	$ -	$ -
61	R48s48a48Aa	1																		1	Unknown	5	$ -	$ -
60	R48s48Aa49a																			0	Unknown	0	$ -	$ -
	Total:							**$ 6,326,000**	**$ 3,133,000**				**$ 5,862,000**	**$ 2,600,000**				**$ 10,603,000**	**$ 5,783,000**				**$ 22,791,000**	**$ 11,516,000**

*Costs shown are construction cost

Table F-5: 2023-2047 DIRP Summary

Rehabiliation Years	AE Block Number	Street ID	Total Block Infrastructure Construction High-Cost	Total Block Infrastructure Construction Low-Cost	Length of Watermain (m)	Length of Sanitary Sewer (m)	Length of Storm Sewer (m)
2023-2025	21	R49a48s50s	$ 729,000	$ 729,000	93	200	105
	24	R48Aa52As53s	$ 152,000	$ -	40	30	35
	25	R48Aa52s52As	$ 321,000	$ -		16	100
	26	R48Aa51s52s	$ 384,000	$ -		97	94
	27	R48Aa50s51s	$ 576,000	$ 576,000	105	54	168
	29	R48Aa48s49s	$ 105,000	$ 105,000	100		
	40	R52s48a48Aa	$ 749,000	$ 749,000	287	221	110
	59	R48s49a50a	$ 266,000	$ 266,000	173	173	
		Block Total:	**$ 3,282,000**	**$ 2,425,000**	**798**	**791**	**612**
2026-2028	7	R51a47s48s	$ 632,000	$ 632,000	91	111	20
	10	R50a52s52As	$ 612,000	$ 612,000		99	94
	11	R50a51s52s	$ 205,000	$ 9,000		99	102
	35	R52As49a50a	$ 190,000	$ 69,000	172	172	
	51	R49al50a51a	$ 98,000	$ 13,000		117	
	52	R49al49a50a	$ 145,000	$ 55,000		173	
	53	R49al48Aa49a	$ 78,000	$ 2,000		32	76
	54	R49s50a51a	$ 269,000	$ 18,000	180	170	
	55	R49s49a50a	$ 449,000	$ 449,000	170	174	78
		Block Total:	**$ 2,678,000**	**$ 1,859,000**	**613**	**1147**	**370**
2029-2031	5	R51a49s50s	$ 166,000	$ 166,000	112	104	
	12	R50a50s51s	$ 796,000	$ 796,000		56	175
	23	R49a46s47s	$ 215,000	$ 5,000	125	131	
	41	R51s50a51a	$ 235,000	$ 235,000	170	74	
	42	R51s49a50a	$ 1,163,000	$ 1,163,000	167		260
	47	R50s50a51a	$ 262,000	$ 262,000	168	173	
	62	R47s50a51a	$ 218,000	$ 218,000	167	117	
		Block Total:	**$ 3,055,000**	**$ 2,845,000**	**909**	**655**	**435**
2032-2034	1	R51a52As53s	$ 204,000	$ 204,000	137		
	2	R51a52s52As	$ 105,000	$ 105,000	100		
	17	R49a52s52As	$ 172,000	$ 40,000	105	99	
	31	R53s50a51a	$ 1,003,000	$ 1,003,000	167	173	180
	32	R53s49a50a	$ 1,000,000	$ 1,000,000	173	173	168
	37	R52s50a51a	$ 247,000	$ 247,000	160	172	
		Block Total:	**$ 2,731,000**	**$ 2,599,000**	**842**	**617**	**348**
2035-2037	30	R48al46s47s	$ 220,000	$ 5,000	52	64	156
	45	R50al50a51a	$ 101,000	$ 6,000		120	
	46	R50al49a50a	$ 319,000	$ 8,000		173	162
	56	R49s48Aa49a	$ 622,000	$ 622,000	175	176	173
	57	R49s48a48Aa	$ 192,000	$ 192,000	120	86	
	65	R46s50a51a	$ -	$ -			
	66	R50a45s46s	$ 163,000	$ 7,000	114	109	
	67	R46s49a50a	$ 187,000	$ 16,000	126	128	
	68	R46s48a49a	$ 382,000	$ 382,000	220	231	29
		Block Total:	**$ 2,186,000**	**$ 1,238,000**	**807**	**1087**	**520**
2038-2040	18	R49a51s52s	$ 379,000	$ -	93	99	111
	19	R49a50s51s	$ 428,000	$ -	94	210	110
	20	R49a49s50s	$ 386,000	$ -	112	210	88
	22	R49a47s48s	$ 188,000	$ -	112	112	
	38	R52s49a50a	$ 720,000	$ 80,000	181	173	160
	39	R52s48Aa49a	$ 754,000	$ -	176	169	170
		Block Total:	**$ 2,855,000**	**$ 80,000**	**768**	**973**	**639**
2041-2043	3	R51a51s52s	$ 79,000	$ -	102		
	4	R51a50s51s	$ 79,000	$ -	103		
	6	R51a48s49s	$ 141,000	$ 4,000	112	100	
	8	R51a46s47s	$ 138,000	$ -		165	
	33	R53s48Aa49a	$ 445,000	$ -	181		182
	36	R52As48Aa49a	$ 321,000	$ 22,000	180	171	60
	43	R51s48Aa49a	$ 322,000	$ -	168	168	
	44	R51s48a48Aa	$ 366,000	$ 366,000	141	83	67
	48	R50s49a50a	$ 739,000	$ 36,000	171	173	183
		Block Total:	**$ 2,630,000**	**$ 428,000**	**1158**	**860**	**492**
2044-2047	9	R50a52As53s	$ 110,000	$ -	92	60	
	13	R50a49s50s	$ 283,000	$ -			101
	14	R50a48s49s	$ 272,000	$ -			97
	15	R50a47s48s	$ 190,000	$ -	112	115	111
	16	R50a46s47s	$ 54,000	$ -	87		
	28	R48Aa49s50s	$ 170,000	$ -			97
	34	R52As50a51a	$ 247,000	$ -	162	173	
	49	R50s48Aa49a	$ 787,000	$ -	165	173	167
	50	R50s48a48Aa	$ 189,000	$ -	124	111	
	58	R48s50a51a	$ 480,000	$ -	167	168	168
	60	R48s48Aa49a	$ -	$ -			
	61	R48s48a48Aa	$ -	$ -			
	63	R47s49a50a	$ 213,000	$ 41,000	173	103	
	64	R47s48a49a	$ 378,000	$ -	239	232	17
		Block Total:	**$ 3,373,000**	**$ 41,000**	**1321**	**1135**	**758**
		DIRP Total:	**$ 22,790,000**	**$ 11,515,000**	**7216**	**7265**	**4174**

Table F-6: Master Plan Upgrades Cost Summary

AE Block Number	Street ID	Watermains Rehabilitation							Storm Sewers Rehabilitation							Total Block Infrastructure High-Cost	Total Block Infrastructure Low-Cost
		Length (m)	Diameter (mm)	High-Cost Treatment	Low-Cost Treatment	Block Watermain Score	Total Block Water High-Cost	Total Block Water Low-Cost	Length (m)	Diameter (mm)	High-Cost Treatment	Low-Cost Treatment	Block Storm Sewer Score	Total Block Storm High-Cost	Total Block Storm Low-Cost		
55	R49s49a50a	170	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	70	$ 179,000	$ 179,000.00						$ -	$ -	$ 179,000	$ 179,000
27	R48Aa50s51s	105	300	Install New Line (MP)	Install New Line (MP)	50	$ 111,000	$ 111,000.00						$ -	$ -	$ 111,000	$ 111,000
40	R52s48a48Aa						$ -	$ -	110	900	Install New Line (MP)	Install New Line (MP)	50	$ 308,000	$ 308,000.00	$ 308,000	$ 308,000
21	R49a48s50s						$ -	$ -	105	unk	Address Surcharging (MP)	Address Surcharging (MP)	31	$ 450,000	$ 450,000.00	$ 450,000	$ 450,000
12	R50a50s51s						$ -	$ -	86	300	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	80	$ 753,000	$ 753,000.00	$ 753,000	$ 753,000
32	R53s49a50a						$ -	$ -	168	450	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	36	$ 662,000	$ 662,000.00	$ 662,000	$ 662,000
7	R51a47s48s						$ -	$ -	20	300	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	21	$ 469,000	$ 469,000.00	$ 469,000	$ 469,000
31	R53s50a51a						$ -	$ -	36 144	375 450	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	36	$ 672,000	$ 672,000.00	$ 672,000	$ 672,000
41	R51s50a51a	170	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	31	$ 179,000	$ 179,000.00						$ -	$ -	$ 179,000	$ 179,000
10	R50a52s52As						$ -	$ -	94	300	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	63	$ 536,000	$ 536,000.00	$ 536,000	$ 536,000
1	R51a52As53s	27110	150300	R&R + Install New Line (MP)	R&R + Install New Line (MP)	74	$ 205,000	$ 205,000.00						$ -	$ -	$ 205,000	$ 205,000
42	R51s49a50a	167	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	28	$ 176,000	$ 176,000.00	170	750	R&R, Address Surcharging (MP)	R&R, Address Surcharging (MP)	71	$ 988,000	$ 988,000.00	$ 1,164,000	$ 1,164,000
2	R51a52s52As	100	300	Install New Line (MP)	Install New Line (MP)	50	$ 105,000	$ 105,000.00						$ -	$ -	$ 105,000	$ 105,000
29	R48Aa48s49s	100	300	Install New Line (MP)	Install New Line (MP)	50	$ 105,000	$ 105,000.00						$ -	$ -	$ 105,000	$ 105,000
44	R51s48a48Aa	5784	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	20	$ 228,000	$ 228,000.00						$ -	$ -	$ 228,000	$ 228,000
56	R49s48Aa49a	175	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	19	$ 184,000	$ 184,000.00						$ -	$ -	$ 184,000	$ 184,000
57	R49s48a48Aa	120	300	R&R + Upsize Line (MP)	R&R + Upsize Line (MP)	19	$ 126,000	$ 126,000.00						$ -	$ -	$ 126,000	$ 126,000
Total:							**$ 1,598,000**	**$ 1,598,000**						**$ 4,838,000**	**$ 4,838,000**	**$ 6,436,000**	**$ 6,436,000**