

TRI-MUNICIPAL **REGIONAL** PLAN



Transportation, Utilities and Infrastructure Strategy

Final Report

April 2021



Submitted by: ISL Engineering and Land Services

CORPORATE AUTHORIZATION

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PURPOSE OF THIS REPORT

The following draft report is for internal review by the integration Consultant and Municipal staff for their comments.

How to Use This Report

This report is intended as input to the Integration Consultant in preparing the Tri-Municipal Regional Plan and as a supporting document to the Regional Plan.

This report should be read with the Preferred Land Use Plan report prepared by Stantec Consulting. The detailed servicing plans included herein are based on the Preferred Land Use Plan. The proposed land use zoning, anticipated timing and land use statistics are included in that report.

EXECUTIVE SUMMARY

Introduction

The Transportation, Utilities, and Infrastructure (TUI) Strategy is created on behalf of the City of Spruce Grove, Town of Stony Plain, and Parkland County (the “Tri-Municipal Region”) as an input to the Tri-Municipal Regional Plan. The subject report focuses on providing detailed transportation, utilities and infrastructure for servicing the preferred Tri-municipal Region Land Use Plan for the 40-year horizon based on reviewing existing systems, current plans and incorporating high-level servicing strategies.

- ◆ Transportation includes roadways, transit, active transportation and goods movement and considers local plans and implications from external influences including Alberta Transportation (AT), Edmonton Metropolitan Region Board (EMRB), CN Rail and the Edmonton Metropolitan Transit Service Commission (EMTSC).
- ◆ Utilities includes power transmission, power distribution, oil / gas pipelines, gas distribution, and telecommunications. These utilities typically do their own planning and engineering with little to no input from municipal governments.
- ◆ Infrastructure includes water, wastewater and stormwater and relies on detailed planning studies conducted on behalf of the municipalities and the local water and wastewater commissions.

Study Outline

Report sections are described as follows:

- ◆ **Section 1.0 Introduction:** Detailed introduction providing additional details about the project, the purpose of the TUI strategy and a description of how the TUI Strategy ties in with the Metropolitan Region Servicing Plan, by the EMRB.
- ◆ **Section 2.0 – 6.0 Current State Review:** Detailed review of existing water, wastewater, stormwater, transportation, and utility systems, along with current plans for these systems. A significant number of documents were reviewed and are outlined in their respective sections.

- ◆ **Section 7.0 High Level Strategies:** High level strategies independent of a land use plan, focusing on big picture ideas for providing more cohesive transportation, utility and infrastructure servicing for the Tri-Municipal region.
- ◆ **Sections 8.0 – 11.0:** Detailed water, wastewater, stormwater, and transportation servicing plans for servicing the preferred land use plan and aligning with high level strategies where possible.
- ◆ **Section 12.0:** Conclusions and Recommendations

Water

Existing water master plans were used to develop detailed water servicing plans for the Preferred Land Use Plan. Development is generally contiguous, and servicing was typically provided by extending the existing water distribution system. New reservoirs are planned for the Acheson and Fifth Meridian ASP areas of Parkland County and the western part of Stony Plain. Spruce Grove has adequate reservoir capacity for the 40-year study period.

There may be opportunity for Stony Plain and Parkland County to share reservoir capacity in the 2040 to 2050 growth horizon. Sharing potable water infrastructure has numerous challenges, but there is time to determine if the benefits provided justify these challenges.

Wastewater

Existing wastewater master plans were also used to develop detailed wastewater servicing plans for the Preferred Land Use Plan. Servicing was typically provided by extending the existing wastewater collection system. Stony Plain and Spruce Grove can be serviced by gravity, while Parkland County will need a lift stations to service the Fifth Meridian ASP and multiple lift stations to service the Acheson area.

With the Alberta Capital Region Wastewater Commission providing wastewater transmission and treatment services, there are limited opportunities for the Region to improve its overall wastewater system by working together. There is opportunity for minor improvements in Parkland County's Fifth Meridian ASP servicing if connected to the ACRWC system via Stony Plain.

Stormwater

Similar to water and wastewater, existing stormwater master plans were used to develop detailed stormwater servicing plans for the Preferred Land Use Plan. Development is generally contiguous, and servicing was typically provided by extending the existing stormwater collection systems and providing on-site stormwater management facilities.

With topography running south to north, the stormwater drainage systems are generally confined to each municipality, the exception being where Spruce Grove and Stony Plain's system discharge into Parkland County. There may be opportunity for Stony Plain and to optimize the overall stormwater drainage system along their border south of Highway 16A. This would require sharing stormwater infrastructure, which has numerous challenges. Further study is needed to determine if the benefits provided justify these challenges.

Transportation

Detailed servicing plans for roadway plans adopt and expand on existing plans as needed for servicing the preferred land use plans and to align with strategic action items. Transportation plans are subject change as there are several concurrent studies, with Parkland County and the Edmonton Metropolitan Region completing their Transportation Master Plans (TMP) later in 2021 and Spruce Grove indicating their TMP is planned to be updated and their current version is no longer valid. For roads, several provincial highways are widened, including Highway 16, Highway 16 A and Highway 628 to six lanes, with completion of Highway 60 twinning and rail grade separation. Arterial improvements include build out of the network as indicated in the relevant plans, a new east/west corridor connecting between Stony Plain, Spruce Grove and Acheson, extension of north/south roads from Spruce Grove to Highway 628 and a new rail grade separated crossing on Veterans Boulevard.

Transit plans are based on the Edmonton Metropolitan Transit Service Commission and Tri-municipal Transit Plans, including a regional transit route along Highway 628 and expansion of local connector and core routes, between Spruce Grove, Stony Plain and Acheson. Active transportation connections (trails and sidewalks) are provided along arterial roadways within Spruce Grove and Stony Plain, including connections along the new east/west corridor and along Highway 16 A. Existing and future standards in Acheson are industrial/rural, which exclude sidewalks and trails.

Goods movement includes municipal truck routes expanding with expansion of the arterial roadway network. Highway 628 is added to the provincial long combination vehicle routes. A Tri-municipal oversize/overweight corridor connects industrial areas in Stony Plain and Spruce Grove to Acheson and the proposed/future provincial high load corridor on Highway 60. The corridor connects through future industrial areas of Spruce Grove and follows the new east/west connection to Acheson, avoiding the CN crossing bridge on Highway 16A and the interchange bridge at Highway 16A/Highway 779 which are not expected to accommodate heavy vehicles.

Utilities (Power, Oil/Gas & Telecommunications)

Utility companies, though regulated, generally manage their own systems and do not share information relating to system capacities and long-term plans with municipalities. Expansion and upgrading is generally done in response to servicing needs resulting once development plans are established, and based on the utility's individual business model. As a result, a detailed utility servicing plan for the Preferred Land Use Plan could not be prepared.

The lack of suitable broadband (telecommunications) network can be a constraint to economic development. The study considered ways to improve broadband servicing (geographically and speed) through partnering and/or incentives.

Recommendations

Water

Recommended water servicing plans are provided in Section 8.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal water system master plan.
- ◆ As additional reservoir capacity is projected in 2040-2050 growth horizon for Stony Plain and Fifth Meridian ASP, consider ways that potable water storage can be shared.

Wastewater

Recommended wastewater servicing plans are provided in Section 9.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal wastewater master plan.
- ◆ Develop options for servicing the Fifth Meridian ASP land along Highway 779 to the ACRWC through Stony Plain.

Stormwater

Recommended stormwater servicing plans are provided in Section 10.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal stormwater master plan.
- ◆ Consider developing shared stormwater management infrastructure where storm basin boundaries do not align with municipal boundaries.
- ◆ Develop a joint “Low Impact Development” (LID) Strategy

Transportation

Recommended transportation servicing plans are outlined in Section 11.0. In addition, the following are recommended:

- ◆ Coordinate with AT to downgrade the classification of Highway 16 A to allow direct access to future growth areas.
- ◆ Coordinate at a Tri-municipal level to manage the Highway 16 A corridor, including access planning and traffic operations.
- ◆ Coordinate with the EMRB and AT to pursue completion of highway improvement projects as noted in the detailed transportation servicing plans.
- ◆ Complete joint planning studies, including the following:
 - ◆ Tri-municipal Transportation Master Plan
 - ◆ Tri-municipal Transit Plan (update)
 - ◆ Tri-municipal Transit Plan Goods Movement Study

Utilities

The following recommendations are made specific to broadband:

- ◆ Stony Plain and Parkland County should also complete a Fibre Optic Broadband Strategy Study
- ◆ The Region should identify sources of funding for bringing broadband to rural areas.
- ◆ The Region should assess opportunities to implement partnering and/or incentivizing provision of broadband.

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1.0 INTRODUCTION

In February 2018, the Government of Canada announced the phasing out of traditional coal-fired electricity generation by 2030. In conjunction with this announcement, the federal government committed \$35 million over five years for skills development and economic diversification for affected communities. This presented an opportunity for the Tri-Municipal Region to seek funding to develop the Tri-Municipal Regional Plan. A letter of intent, signaling the commitment of each municipality to develop the Tri-Municipal Regional Plan, was signed in January of 2019. Funding was secured from Western Economic Diversification in early 2019 and work related to the development of the Tri-Municipal Regional Plan will continue into 2021. The Tri-Municipal Region has collaborated on significant projects and initiatives in the past, including the TransAlta Tri Leisure Centre; however, the commitment to this plan represents a holistic and coordinated effort to enhance and formalize this collaboration.

The Tri-Municipal Regional Plan will enable the partners to strategically align land use, services, and infrastructure to achieve mutual benefit through aligned operational deployment. The Tri-Municipal Regional Plan will have a specific goal to coordinate and drive investment within the Tri-Municipal Region in a manner that enables each partner municipality to both individually and collectively achieve heightened local, regional, and global competitiveness based on the philosophy of ‘shared investment for shared benefit’. The Tri-Municipal Regional Plan is made up of three pillars, Pillar 1: Governance, Pillar 2: Plans and Strategies, and Pillar 3: Implementation. The Transportation, Utilities and Infrastructure Strategy Consultant will be working within Pillar 2: Plans and Strategies.



Figure 1.1: Tri-Municipal Region Plan Pillars

The strategies under Pillar 2 have been sequenced to allow for a natural phasing of findings and analysis to inform the final Tri-Municipal Regional Plan. All secondary consultants will be secured for two phases of work within their project. First, the completion of a report (based on the document standards developed with the Integration Consultant) and second, the refinement of their report to support its integration into the final overall Tri-Municipal Regional Plan.

1.1 Purpose of TUI Strategy

The purpose of this study is to develop a Transportation, Utilities, and Infrastructure (TUI) Strategy on behalf of the City of Spruce Grove, Town of Stony Plain, and Parkland County (the “Tri-Municipal Region”) as a component of work on the development of a Tri-Municipal Regional Plan. This includes undertaking an assessment of transportation, utilities, and infrastructure of the Tri-Municipal Region based on existing plans, documents and materials from each municipal partner, as well as the documented Current State Analysis and a Municipal Services Strategy. The resulting strategy will provide support for the team developing the preferred land use scenario strategy.

The TUI Strategy will take a 40-year view and acknowledge the Edmonton Metropolitan Region Board (EMRB) Growth Plan and its population and job projections as well as the Metro Region Servicing Plan (MRSP). The TUI Strategy will be key to moving from high-level economic strategy to on-the-ground development that provides return on municipal and private sector investment and diversifies the regional economy through the creation of complete communities. The strategy will support the visionary, forward-looking preferred land use scenario and will identify land that is optimal for development through analysis of natural features, availability of servicing and transportation networks, and will result in minimal land use conflict.

Through a deep mutual understanding of the concept of ‘shared investment – shared benefit’, the preferred infrastructure expansion will de-emphasize the role of municipal boundaries. This will build the broader community-region through integration of lands and seek to create the best possible strategic plan for highest and best use of lands based on land suitability, market forces and efficient infrastructure. This will include opportunities for transportation connectivity for all modes of movement that can be located outside of highway corridors. Each partner municipality may then benefit from development within the Tri-Municipal Region based on their level of shared investment regardless of location.

1.2 Edmonton Metropolitan Region Servicing Plan and TUI Strategy

The Edmonton Metropolitan Regional Board (EMRB), Metropolitan Region Servicing Plan (MRSP) focuses on the servicing requirements for supporting the Edmonton Metropolitan Regional Growth Plan (EMRGP). The MRSP includes a detailed environmental scan of current state and future considerations for servicing the EMRGP for seven service areas including roads, transit, solid waste, emergency services, water, wastewater and stormwater. The TUI strategy focuses on services needed to support the Tri-municipal preferred land use plan and may link to the EMRB in the following potential areas:

- ◆ An input to future and ongoing servicing studies completed by the EMRB that include transportation (roads, transit, active transportation, goods movement), infrastructure (gas, power, telecommunications, pipelines) and utilities (water, wastewater, stormwater).
- ◆ As an input for evaluating prioritization of projects in the Tri-municipal region.
- ◆ For understanding existing systems and current plans within the Tri-municipal region.

1.3 Study Outline

- ◆ **Section 2.0 – 6.0:** Detailed review of existing water, wastewater, stormwater, transportation, and utility systems, along with current plans for these systems
- ◆ **Section 7.0:** High Level Strategies that are not dependent on the Preferred Land Use Plan
- ◆ **Sections 8.0 – 11.0:** Detailed water, wastewater, stormwater, and transportation servicing plans based on the Preferred Land Use Plan
- ◆ **Section 12.0:** Conclusions and Recommendations

2.0 EXISTING WATER SYSTEMS

2.1 Overview of Documents Reviewed

The relevant documents reviewed for the existing Tri-Municipal region water networks are shown in **Table 2.1**.

Table 2.1: Existing Water Systems – Relevant Background Reports.

Index	Document Title	Document Date	Municipality
N/A	City of Spruce Grove Water Master Plan Update, Select Engineering Consultants Ltd.	June 2015	Spruce Grove
387	Community Water Conservation Program: Blueprint for Success 2016 to 2020, Econics	February 2016	Spruce Grove
426	Municipal Development Plan 2010 – 2020	February 2020	Spruce Grove
046	Spruce Grove City Centre Area Redevelopment Plan, Cushing Terrell	January 2018	Spruce Grove
386	Water and Sanitary Master Plan Update, Associated Engineering	March 2019	Town of Stony Plain
388	Acheson and Big Lake Area Water Servicing Study, AECOM	September 2016	Parkland County

2.2 Governance

Water systems within the study area include those owned and operated by the three municipalities, the Capital Region Parkland Water Services Commission (CRPWSC), West Inter Lake District (WILD), the Regional Water Customers Group (RWCG) and EPCOR. This is discussed as follows:

- ◆ **Parkland County** – Own and operate all water mains, reservoirs, valves and hydrants within the County. Parkland County also owns and operates a truck fill water station in Acheson that connects to the CRPWSC Water System.
- ◆ **City of Spruce Grove** – Own and operate all water mains, reservoirs, valves and hydrants within the City. The City of Spruce Grove has an intermunicipal servicing agreement to provide water to Parkland Village within the County.
- ◆ **Town of Stony Plain** – Own and operate all water mains, reservoirs, valves and hydrants within the Town.
- ◆ **EPCOR** – Treats raw water from the North Saskatchewan River and pumps it to their customers including the CRPWSC, which is part of the RWCG.
- ◆ **Alberta Utilities Commission** – regulates the relationship between the RWCG and EPCOR.
- ◆ **CRPWSC** – operates and maintains the transmission mains that service Spruce Grove, Stony Plain and the County. The CRPWSC Regulation under the MGA, Alta Reg 291/1984 states that the water services shall be supplied to all customers on an as required basis and water shortages are to be shared proportionately.
- ◆ **WILD** – services communities to the west of the CRPWSC transmission line.

2.3 Existing Water Infrastructure

2.3.1 Comparison of Existing Water Design Standards

A summary comparison of existing design standards and guidelines is shown in **Table 2.2**. As shown, a lot of values are not listed within the Spruce Grove standards. System pressures during peak hour and fire flow conditions are similar among the three municipalities with Parkland County being slightly more conservative during peak hour demand. Spruce Grove has the highest fire flow requirements at 300 L/s for non-residential land uses compared to Stony Plain and Parkland County.

Table 2.2: Comparison of Water Design Standards and Guidelines.

Design Parameter		Municipality		
		City of Spruce Grove	Town of Stony Plain	Parkland County
Design Flows	Average Daily Demand (L/c/d)	-	300	350
	Maximum Day Peaking Factor (-)	-	2.0	2.0
	Peak Hour Peaking Factor (-)	-	3.0	3.0
	Non-Residential Average (L/ha/d)	-	-	6000
System Pressures	Max Day + Fire Flow (kPa)	140	150 ¹	150
	Peak Hour (kPa)	280	280	350
Fire Flow Requirements	Low-Density Residential (L/s)	-	83 – 100 ²	60
	Medium-Density Residential (L/s)	-	133	90
	High-Density Residential (L/s)	300	200 ²	115
	Commercial (L/s)	300	183 - 233	-
	Institutional (L/s)	300	100	90
	Industrial (L/s)	300	150 - 183	230
Hydrant Spacing	Residential (m)	150 ³	150 ³	120 – 150 ⁴
	Non-Residential (m)	120	90	90 – 120 ⁴

Notes:

1. Stony Plain MDD+FF zone minimum is 280 kPa. 150 kPa applies only to the location of the fire.
2. Low-density and high-density residential have rural fire flow requirements of 33 L/s and 50 L/s, respectively, in rural areas.
3. Spruce Grove and Stony Plain maximum hydrant spacing is 150 m for single family but 120 m and 90 m for multi-family, respectively.
4. Parkland County hydrant spacing is ≤ 120 m for multi-family and institutional land uses and ≤ 150 m for single family residential area.

2.3.2 CRPWSC and WILD

The CRPWSC system is shown on **Figure 2.1**, along with the WILD network and key booster stations and reservoirs it connects to. The CRPWSC transmission mains begin from the CRPWSC CFRN Booster Station where the mains transition from EPCOR to the CRPWSC. The transmission mains follow the Highway 16A alignment from the CFRN Booster Station located north of the intersection of Highway 16A and 186 Street and continues through Acheson and Spruce Grove along Highway 16A and eventually through Stony Plain along the Canadian National Railway (CNR) alignment which diverts southwest from Highway 16A. The transmission mains are 300 and 600 mm between the CFRN booster station and the Zone-1 Reservoir and Pumphouse in Spruce Grove. Between Spruce Grove and Stony Plain, the commission mains are smaller at 200 mm and 400 mm.

Acheson Zone 4 Reservoir is filled by a 150 mm fill line from the CRPWSC along Range Road 262A and the Zone 3 Reservoir is filled from the main line along Highway 16A. Currently, Phase 1 twinning has been completed which twins the existing 600 mm and 300 mm mains with a new 750 mm main from 231 Street to the Zone 3 Reservoir. The remainder of Phase 1 upgrading and Phases 2 and 3 are described in Section 2.4.1.

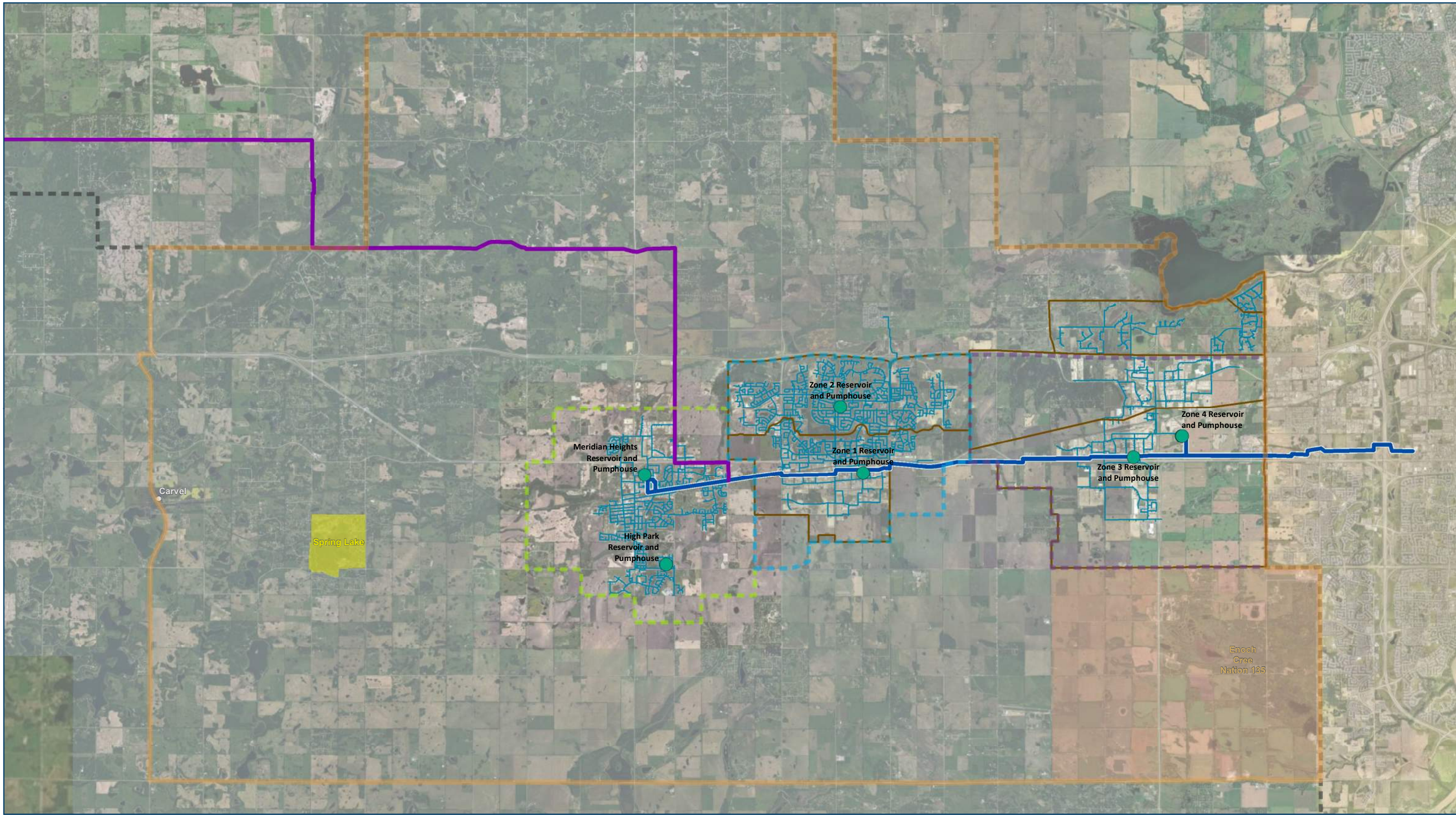
From the Zone 3 Reservoir in Acheson, the 600 / 300 mm transmission main continues to the Zone #1 Reservoir and Pumphouse within Spruce Grove, which is bounded by Diamond Avenue, South Avenue, Yellowhead Road and Shep Street, within the industrial area of Spruce Grove, south of Highway 16A.

From the Zone 1 Reservoir and Pumphouse within Spruce Grove, the CRPWSC mains continue through Spruce Grove's industrial area along South Avenue, Alberta Avenue and Madison Crescent and eventually to Stony Plain's Meridian Park Reservoir along the CNR alignment.

The WILD service connection branches off the CRPWSC main line at the intersection of CNR and Veterans Boulevard along the eastern edge of Stony Plain. The WILD transmission main is a 450 mm HDPE pipe and services Kapasawin, Wabamun and various country residential locations.

2.3.3 Spruce Grove

The existing Spruce Grove boundary encompasses approximately 2,620 ha and the overall topography slopes northwards with an elevation difference of 50 m. The existing Spruce Grove water network is shown on **Figure 2.2** along with both the Zone 1 and Zone 2 Reservoirs. The pressure boundary is shown on this figure as well in a dashed line. The pressure zone boundary has four pressure reducing valves (PRVs) which are set at an HGL of 735.73 m which throttles pressure from Zone 1 as it enters Zone 2. A fifth PRV regulates the pressure between the Zone-1 and Zone-2 fill line (600 mm).



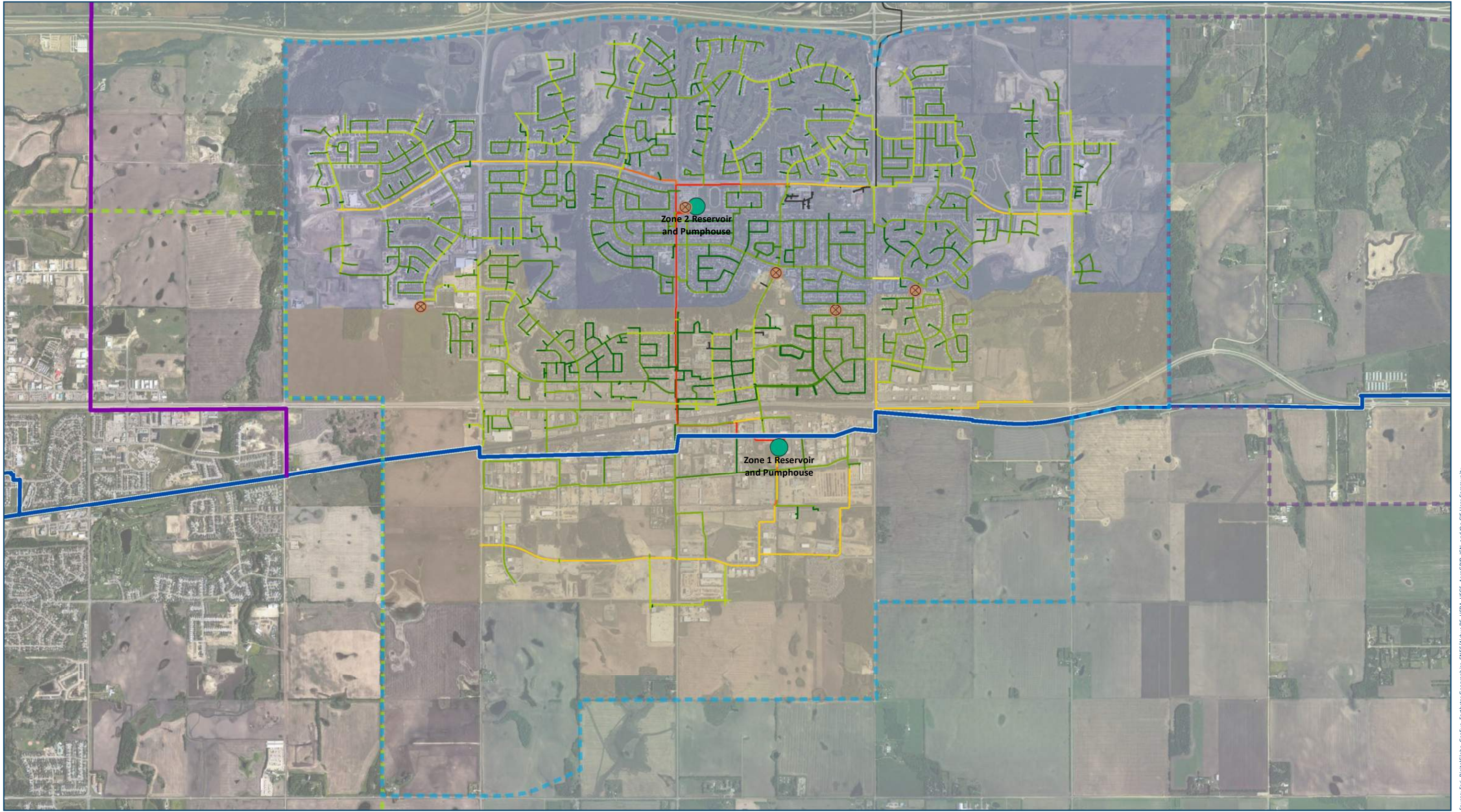


Table 2.3 summarizes the Zone 1 and 2 Reservoir's storage and pumping capacities. The CRPWSC 600 mm and 300 mm transmission mains fill the existing Zone 1 Reservoir directly and there is no direct connection between the CRPWSC and the Spruce Grove distribution system. The Zone 2 Reservoir is filled from the Zone 1 Reservoir at a controlled rate through a 600 mm watermain and a pressure reducing valve set to 411 kPa (60 psi) or an HGL of 735.73 m.

Table 2.3: Existing Reservoir Operating Conditions.

Property	Zone 1 Reservoir & Pumphouse	Zone 2 Reservoir & Pumphouse
Location	North of the intersection between Diamond Avenue and Yellowhead Road	South of Spruce Grove Composite High School
Storage Capacity (m ³)	42,500	8,619
Pumping Configuration	92-P-001 (P1) Active (96 L/s) 92-P-002 (P2) Active (96 L/s) 92-P-003 (P3) Active (152 L/s) 92-P-004 (P4) Fire (300 L/s) 92-P-005 (P5) Standby (300 L/s)	Pump-4 / Pump-5 not working Pump-6 Active Pump-7 100% Backup Fire Pump-2 & 3 Standby
Pumping Capacity (L/s) ¹	344.0	126.0
Fire Pump Capacity (L/s)	300.0	207.0
Discharge Header Pressure (kPa)	420	347 (643 during fire flow)
Reservoir Elevation (m) ²	713.767	700.370
Discharge Header HGL (m)	756.580	735.730

Notes:

1. Zone 1 pumping capacity based on P1, P2 and P3 which are the distribution pumps and a fire pump with a capacity of 300.0 L/s. Zone 2 pumping capacity assumes Pump-6 is active.
2. Reservoir elevations calculated from HGL and discharge pressure.
3. Data acquired from City of Spruce Grove Water Master Plan Update, Select Engineering Consultants Ltd (2015). The Zone-1 Reservoir storage and pumping capacity has been updated based on recent upgrades from the City of Spruce Grove Zone-1 Reservoir and Pump Station Upgrades, 2016.

The four PRVs along the pressure zone boundary and the fifth PRV along the 600 mm transmission main between both reservoirs are summarized in **Table 2.4**.

Table 2.4: Summary of existing Spruce Grove PRVs.

PRV	Location	HGL Set Point (m)
PRV-1	Spruce Ridge Subdivision	735.730
PRV-2	King Street south of Woodhaven Drive	735.730
PRV-3	Berkley Street south of Bellville Avenue	735.730
PRV-4	Lakeland Drive	735.730
PRV-5	Located inside Pumphouse 2	735.730

Notes:

1. Data acquired from City of Spruce Grove Water Master Plan Update, Select Engineering Consultants Ltd (2015).

The current equivalent population (includes commercial and industrial uses) and water demands are summarized in **Table 2.5** with the pumping capacities of each zone. Recent water studies have shown an average residential demand of 177 L/c/d and total system average of 230 L/c/d (as of 2014). Maximum day and peak day factors are 2.0 and 3.0, respectively. If Pump-7 is reserved as a backup, then there are some pumping constraints during peak hour demand within Zone-2, although there is adequate pumping capacity when considering both Zone-1 and Zone-2 together. Storage requirements for the existing system are met and upgrades are not required until the future due to recent upgrades to the Zone-1 storage capacity. A new fire pump installed recently within Zone-1 can achieve 300 L/s fire flow which can supplement the Zone-2 fire flow deficiency when needed.

Table 2.5: Summary of Existing Spruce Grove Demands.

Property	Zone-1	Zone-2	Total
Equivalent Population (2018)	16,748	21,315	38,063
Average Day Demand, ADD (L/s) ¹	58.2	74.0	132.2
Maximum Day Demand, MDD (L/s)	116.3	148.0	274.3
Peak Hour Demand, PHD (L/s)	174.5	222.0	396.5
Pumping Capacity (L/s)	344.0	126.0	470.0
Fire Flow Required (L/s)	300.0	300.0	300.0
Fire Pump Capacity (L/s)	300.0	207.0	-
Storage Required (m ³) ²	12,072	6,197	18,269
Existing Storage (m ³)	42,500	8,619	51,119

Notes:

1. Discrepancies between peaking factors and demands is due to rounding precision.
2. Storage requirements based on two times ADD plus 300 L/s fire flow for 4 hours.

2.3.4 Stony Plain

The existing Stony Plain Town boundary encompasses 3,680 ha and topography generally falls towards the northeast with the highest elevations occurring in the west portion of the Town. The existing Stony Plain water network is shown on **Figure 2.3**. As shown, the CRPWSC 200 mm and 400 mm transmission mains fill the Meridian Heights Reservoir and Pumphouse. During low flows, the distribution system fills the High Park Reservoir through a dual-purpose fill / discharge line.

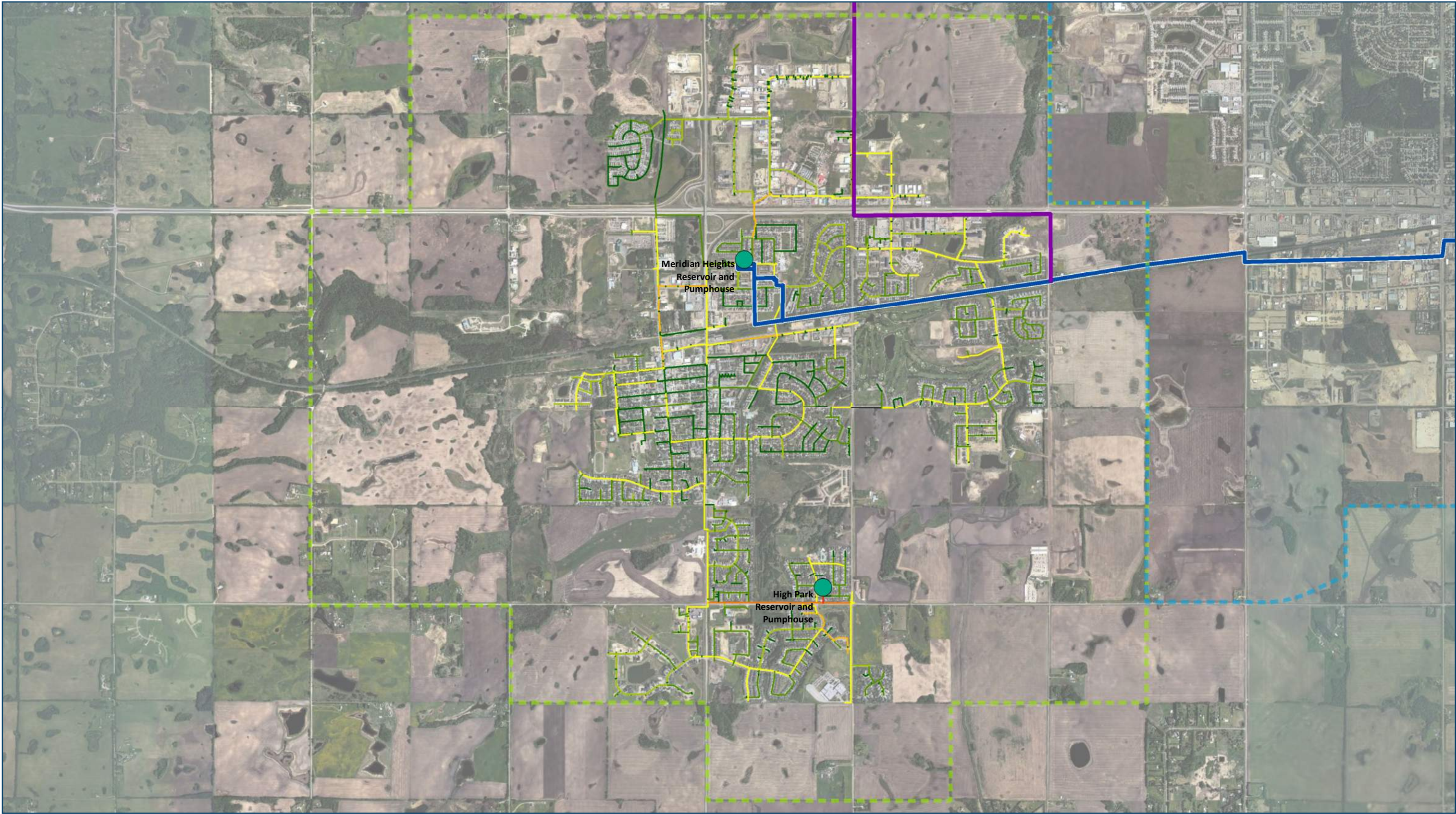


Table 2.6 summarizes the storage and pumping capacities for the Meridian Heights and High Park Reservoirs and Pumphouses.

Table 2.6: Existing Stony Plain Reservoir Operating Conditions.

Property	Meridian Heights Reservoir & Pumphouse	High Park Reservoir & Pumphouse
Location	Northeast of the intersection of 46 Street and 43 Avenue	East of the intersection of High Park Road and Hillside Way
Storage Capacity (m ³)	14,630	4,545
Pumping Configuration	P-102 Distribution Pump P-103 Distribution Pump FP-101 Fire / Standby	P-203 (Jockey) Dist. Pump P-204 Distribution Pump P-205 Distribution Pump FP-201 Fire / Standby FP-202 Fire / Standby
Pumping Capacity (L/s) ¹	140	82
Fire Pump Capacity (L/s)	227	190
Discharge Header Pressure (kPa)	448	413
Reservoir Elevation (m)	707.148	711.059
Discharge Header HGL (m)	752.800	753.200

Notes:

1. Pumping capacity assumes P-102, P-203 and P-204 are active.

Currently there is only one pressure zone for the entire Town since the topography is quite flat. There is one PRV at the High Park Reservoir intended to control the reservoir's outgoing pressure to 753.200 m.

There is one existing truck fill location in Town with an average demand of 45 L/s which is located at Wood Avenue and Boulder Boulevard.

Historical Stony Plain water usage has shown that an average day demand of 46.3 L/s was experienced in 2016 (less the truck fill demands). Water usage also showed a maximum day demand peak factor of 1.7. Assuming conservative peak factors of 2.0 for MDD and 3.0 for PHD, a summary of existing Stony Plain demands and current pumping capacities are shown in **Table 2.7**. Currently, there is available storage capacity within Stony Plain. The pumping capacity at the reservoirs is 0.3 L/s below the peak hour plus truck fill scenario demands. The fire pump has sufficient capacity to provide 233.0 L/s.

The pumping capacity seems to be somewhat low; however, if both P-102 and P-103 pumps are active at the Meridian Heights Reservoir & Pumphouse, then there is sufficient pumping capacity for the entire Town.

Table 2.7: Summary of Existing Stony Plain Demands.

Parameter	Value
Equivalent Population (2018)	18,236
Average Day Demand, ADD (L/s) ¹	59.1
Maximum Day Demand, MDD (L/s)	118.2
Peak Hour Demand, PHD (L/s)	177.3
Assumed Truck Fill (L/s)	45.0
Pumping Capacity (L/s)	222.0
Fire Flow Required (L/s)	233.0
Fire Pump Capacity (L/s)	417.0
Storage Required (m ³) ²	14,329
Existing Storage (m ³)	19,175

Notes:

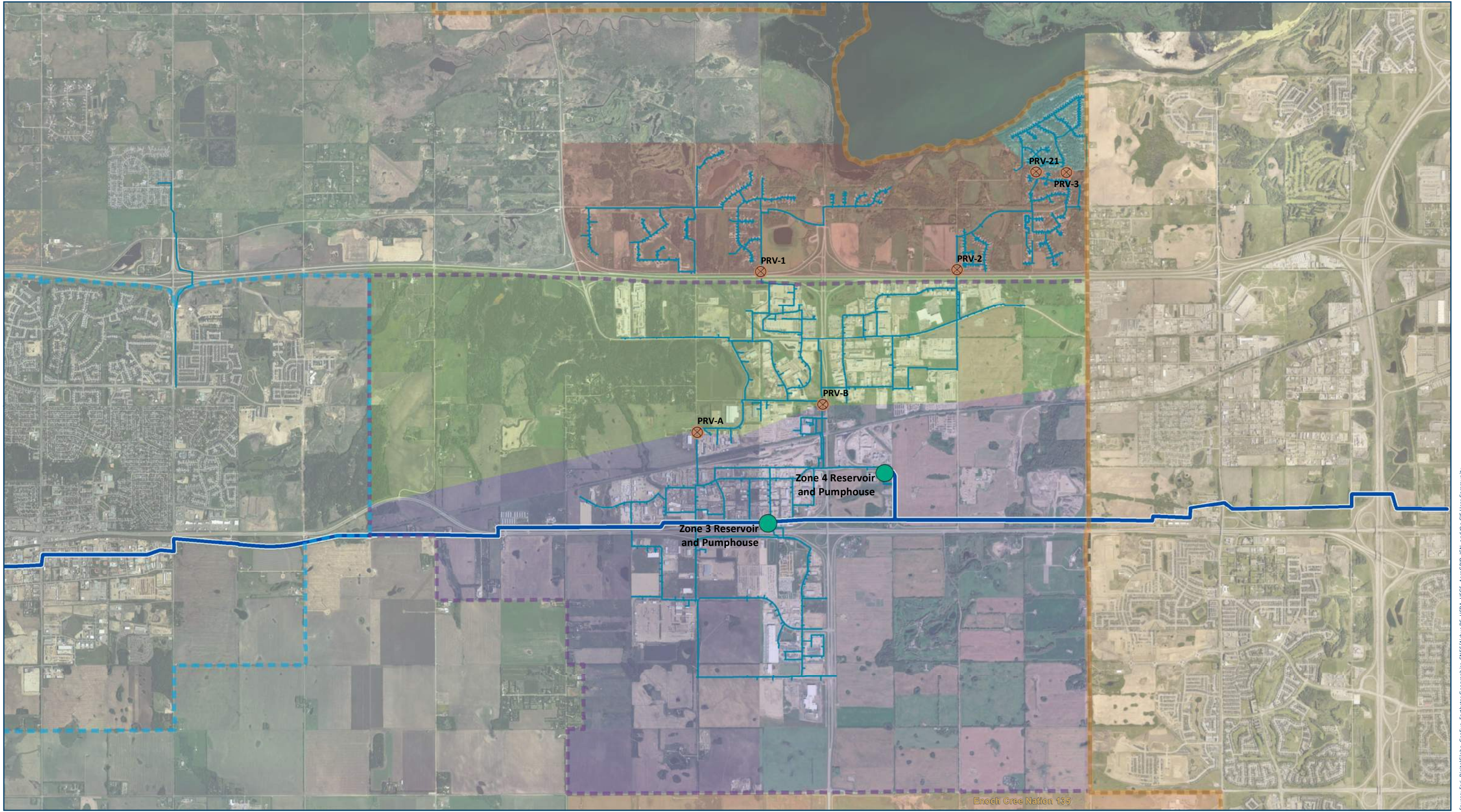
1. Discrepancies between peaking factors and demands is due to rounding precision.
2. Storage requirement based on peak day volume (including truck fill) plus 233 L/s of fire flow for 3 hours.

2.3.5 Parkland County

The most developed location within Parkland County that is serviced by the CRPWSC is the Big Lake / Acheson area which makes up a total area of approximately 6,900 ha. Acheson is primarily industrial whereas the Big Lake area consists of mostly residential development. The topography slopes northwards towards Big Lake and the entire area is serviced by two reservoir-pumphouses, the Zone 3 and Zone 4 Reservoirs, located near the CRPWSC transmission mains and Highway 16A. Development is constrained to the north and to the west due to the Big Lake 100-year flood boundary and the Wagner Natural Area, respectively. The existing Big Lake / Acheson water network is shown on **Figure 2.4**.

There are four pressure zones within the existing Acheson / Big Lake water network, all of which are separated by PRVs as the ground slopes towards Big Lake.

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Date: 2021-03-26



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

TRI-MUNICIPAL
REGIONAL PLAN

1:45,000

0 0.375 0.75 1.5 2.25 3 km

Coordinate System: CANA83-3TM114

- Tri-Municipal Plan Prime Area of Focus
- Acheson Industrial Area
- Parkland County

- City of Spruce Grove
- First Nation

- CRPWSC
- Water Main
- Water Pumphouse
- Pressure Reducing Valve

- Acheson/Big Lake Pressure Zones**
- High Pressure Zone
 - Middle Pressure Zone
 - Lower Pressure Zone
 - Bottom Pressure Zone

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 2.4

ACHESON/BIG LAKE
WATER NETWORK

Table 2.8 summarizes the storage and pumping capacity of both the Zone 3 and Zone 4 reservoirs and pumphouses. Both reservoirs are filled directly from the CRPWSC; however, the Zone 4 Reservoir is filled by a 200 mm HDPE fill line installed in 2006 and a 250 mm HDPE fill line installed in 2017, which both branch off the primary transmission mains.

Table 2.8: Existing Acheson Reservoirs Operating Conditions.

Property	Zone 3 Reservoir & Pumphouse	Zone 4 Reservoir & Pumphouse
Location	Near the intersection of Meyer Road and Ellis Drive	East of Devonian Way on Acheson Road
Storage Capacity (m ³)	4,334	8,758
Pumping Configuration	P-101 Variable Speed P-102 Variable Speed P-103 Lead Variable Speed P-104 Constant Speed P-105 Constant Speed Standby	P-1 Variable Speed P-2 Variable Speed Standby
Pumping Capacity (L/s) ¹	240	105
Fire Pump Capacity (L/s)	-	-
Discharge Header Pressure (kPa)	440	460
Reservoir Elevation (m) ²	716.148	714.109
Discharge Header HGL (m)	761.000	761.000

Notes:

1. Overall pumping capacity with P-105 and P-2 on standby. There are no dedicated fire pumps.
2. Calculated from PRV pressure and HGL settings.

The southern pressure zone (south of the CN Railway) is supplied directly by the reservoirs. PRV-A and PRV-B are located north of the CN Railway and are adjacent to Range Road 264 and Highway 16A, respectively. Further north, the pressure is reduced again by PRV-1 and PRV-2, which feed into the residential areas north of Highway 16. North of PRV-2, the pressure is reduced again by PRV-3 and PRV-21 to the Helenslea Heath and Lakeshore Estates neighbourhoods. These PRVs are labelled on **Figure 2.4** along with estimated pressure zone boundaries.

Table 2.9 summarizes the existing zones as defined by the PRV set points.

Table 2.9: Summary of existing Acheson / Big Lake Area Pressure Zones.

Zone	PRVs	Location	HGL Set Point (m)
High	PRV-4, PRV-5	South of CNR	761
Middle	PRV-A, PRV-B	CNR to Highway 16	742
Lower	PRV-1, PRV-2	North of Highway 16	713 – 735
Bottom	PRV-3, PRV-21	Helenslea Estates and Lakeshore Estates	717

A summary of existing Acheson / Big Lake demands, and current pumping capacities are shown in **Table 2.10**. Note that there is high variability in the industrial water use within Acheson. Historical water use records show that normal demand users average 1,050 L/ha/d whereas high demand users averaged 3,000 L/ha/d, ranging from 1,100 to 32,900 L/ha/d.

The residential area near Big Lake showed a historical average per capita demand of 259 L/c/d. There is a dedicated pump at the Zone 3 Reservoir for a truck fill station on site. Currently, there is sufficient storage and pumping capacity for existing Acheson / Big Lake demands. There are not dedicated fire pumps within the Zone-3 or Zone-4 reservoirs, but the existing pumping system can provide 230 L/s which is the highest fire flow requirement based on Parkland County standards.

Table 2.10: Summary of Existing Acheson / Big Lake Area Demands.

Parameter	Value
Population (2018)	1,352
Average Day Demand, ADD (L/s)	18.1
Maximum Day Demand, MDD (L/s)	36.1
Peak Hour Demand, PHD (L/s)	54.2
Assumed Truck Fill (L/s)	2.76
Pumping Capacity (L/s)	345.0
Fire Flow Required (L/s)	230.0
Fire Pump Capacity (L/s)	-
Storage Required (m ³) ¹	5,603
Existing Storage (m ³)	13,092

Notes:

1. ADD includes the truck fill average of 2.76 L/s.
2. Storage requirements based on RWCG's recommendation to store two times the ADD plus 230 L/s fire flow for 3 hours. This estimate is more conservative than Alberta Environment standards and guidelines.

2.3.6 Tri-Municipal Existing Water Network Comparison

Table 2.11 summarizes the key properties of the three main areas within the Tri-Municipal region.

Table 2.11: Summary of Existing Tri-Municipal Region Water Networks.

Parameter	Spruce Grove	Stony Plain	Parkland County
Population (2018)	38,063	18,236	1,352
# Reservoirs	2	2	2
Storage Capacity (m ³)	51,119	19,175	13,092
Existing Storage Requirements (m ³)	18,269	14,329	5,603
Existing Pumping Capacity (L/s)	470.0	222.0	345.0
Existing Fire Pump Capacity (L/s)	507.0	417.0	-
ADD (L/s)	132.2	59.1	18.1
MDD (L/s)	274.3	118.2	36.1
PHD (L/s)	396.5	177.3	54.2
Truck Fill (L/s)	-	45.0	2.76
# Pressure Zones	2	1	4
Pressure Zone HGL (m)	Zone 1: 756.580 Zone 2: 735.760	752.800 – 753.200	High: 761 Middle: 742 Lower: 713 - 735 Bottom: 717

2.4 Current Plans

2.4.1 CRPWSC and WILD

Due to increasing demands, the CRPWSC has undergone twinning of its transmission system along its entire alignment. **Table 2.12** summarizes the overall demands over the next five years for the CRPWSC.

Table 2.12: CRPWSC Demand Projections 2020 – 2025.

Member	Demand Projections (m ³)					
	2020	2021	2022	2023	2024	2025
Stony Plain	1,590,818	1,610,703	1,630,837	1,651,222	1,671,863	1,692,761
Spruce Grove	2,848,000	2,899,000	2,971,000	3,058,000	3,146,000	3,238,000
Parkland County	561,006	583,446	606,784	631,056	656,298	780,994
WILD Customer Group	334,774	448,773	479,312	523,225	528,457	530,000
Total	5,334,598	5,541,922	5,687,933	5,863,503	6,002,618	6,241,755

As discussed in Section 2.3.1, Phase 1 of the CRPWSC transmission twinning has recently been completed. The twinning completed includes twinning the existing 600 mm and 300 mm transmission mains with a 750 mm from the CFRN Booster Station to the Acheson Zone 3 Reservoir. The 200 mm fill line to the Zone 4 Acheson Reservoir was twinned with a 250 mm line back in 2017. Phase 1 also includes a new Phase 1 Booster Station which will be operational in the fall of 2020.

Phase 2 of the CRPWSC twinning involves continuing the 750 mm twinning from the Acheson Zone 3 Reservoir and Pumphouse to the Spruce Grove Reservoir. Design of this line will begin in 2020 and construction will commence in 2021. Phase 3 is the final branch and involves twinning with a 500 mm transmission main from the Spruce Grove Zone-1 Reservoir and Pumphouse to the Meridian Heights Reservoir and Pumphouse within Stony Plain. Design of Phase 3 twinning is to commence in 2022 with construction in 2023. Table 2.13 shows a cost summary of the CRPWSC twinning.

Table 2.13: Cost Summary for CRPWSC Twinning.

Phase	Cost (\$ in millions)
1	\$25.5
2	\$20.6
3	\$14.2
Total	\$60.3

The WILD system has several future allocations and system upgrades dedicated to new connections to the system. One potential area of development that is relevant for the Tri-Municipal Regional Study is the Fifth Meridian Area Structure Plan, located just north of Stony Plain. Parkland County has paid for system upgrades to the WILD network just north of Stony Plain to allow the WILD system to provide flows to this area.

2.4.2 Spruce Grove

Future pumping capacity and storage requirements is summarized in **Table 2.14** below. As shown, pumping and storage upgrades may be required by 2023 as per the Spruce Grove Master Plan. Fire flow requirements have recently been met as the Zone-1 Pumphouse was recently upgraded with a 300.0 L/s fire pump, which could potentially supplement Zone-2, if needed.

Table 2.14: Future Pumping and Storage Requirements Within Spruce Grove.

Parameter	Year			
	2018	2023	2030	Ultimate
Equivalent Population (c)	38,063	48,579	62,001	75,000
ADD (L/s)	132.16	168.68	215.28	260.42
MDD (L/s)	274.33	347.35	440.56	520.83
PHD (L/s)	396.49	506.03	645.84	781.25
Truck Fill (L/s)	-	-	-	-
Pump Capacity (L/s)	470.0 (977.0 including fire pumps)			
Pump Upgrades?	No	Yes	Yes	Yes
Storage Required (m ³)	27,158	33,468	41,520	49,320
Storage Capacity (m ³)	51,119			
Storage Upgrades?	No	No	No	No

Notes:

1. Storage required is based on fire storage plus two times ADD.
2. It should be noted that the Zone-1 Pumphouse was recently upgraded to provide sufficient distribution pumping to the entirety of Zone-1 during the ultimate development scenario. Zone-2 currently has 126 L/s of pumping capacity based on information available within the 2015 Water Master Plan and will need to be upgraded / rehabilitated in the future (the master plan mentioned that several pumps were not functional).

The Spruce Grove network is expected to develop concentrically in the short term, but in the long term, the growth is heavily focused in the south and southeast. The proposed annexation areas are in the southeast corner of the City and are expected to extend outwards four quarter sections to Range Road 271. To the south, the ultimate network and annexation area is expected to extend all the way to Highway 628.

2.4.3 Stony Plain

Future pumping capacity and storage requirements is summarized in **Table 2.15** below. Assuming the fire flow requirements remain at 233 L/s for Stony Plain, then the fire pump capacity of 417.0 L/s between both reservoirs is sufficient, although pumps should be replaced approximately every 15 years once they begin to wear out.

Table 2.15: Future Pumping and Storage Requirements Within Stony Plain.

Parameter	Year					
	2018	2023	2028	2033	2038	2043
Equivalent Population (c)	18,236	21,140	24,507	28,411	32,936	38,182
ADD (L/s)	59.1	68.5	79.4	92.1	106.7	123.7
MDD (L/s)	118.2	137.0	158.8	184.2	213.4	247.4
PHD (L/s)	177.3	205.5	238.2	276.3	320.1	371.1
Truck Fill (L/s)	45.0	45.0	45.0	45.0	45.0	45.0
Pump Capacity (L/s)	222.0					
Pump Upgrades?	Yes	Yes	Yes	Yes	Yes	Yes
Storage Required (m ³)	14,329	15,955	17,840	20,027	22,561	25,498
Storage Capacity (m ³)	19,158					
Storage Upgrades?	No	No	No	Yes	Yes	Yes

Notes:

1. Storage requirements based on peak day plus fire flow storage.

Development in Stony Plain will remain concentric around the Town over time. A few critical system changes are proposed:

- ◆ A direct connection from the CRPWSC to High Park Reservoir and Pumphouse due to distribution constraints between Meridian Heights and High Park Reservoirs.
- ◆ Additional looping to the south to strengthen the overall network.
- ◆ A new distribution pump and fire / standby pump at Meridian Heights Pumphouse.
- ◆ Storage expansion at the High Park Reservoir.
- ◆ A new West Reservoir and Pumphouse to service the higher elevation lands to the west. This Reservoir would have a direct feed line from the WILD or CRPWSC lines. The West Reservoir would have two heads, one servicing the higher zone and one servicing the lower zone.
- ◆ A new East Reservoir and Pumphouse to service the ultimate network in the southeast.

As development pushes to the west, an additional reservoir, pumphouse and pressure zone will be required as this area to the west increases rapidly in elevation. The East Reservoir and Pumphouse is also proposed to the southeast corner of the town for the ultimate network development. Properties of these proposed reservoirs and pumphouses are summarized in **Table 2.16**. It is proposed that the future West and East Reservoirs have at least 30,000 m³ of storage capacity, with at least 10,000 m³ dedicated to the West Reservoir. The 2019 Water & Wastewater Master Plan for the Town of Stony Plain did not provide specific pumping capacity requirements for each of the newly proposed reservoirs.

Table 2.16: Proposed West Reservoir & Pumphouse Summary.

Parameter	West Reservoir & Pumphouse	East Reservoir & Pumphouse
Storage Capacity (m ³)	10,000 – 20,000	10,000 – 20,000
Pumping Capacity (L/s)	-	-
West Pressure Zone HGL (m)	753.0 & 768.0 (two headers)	753.0

An overall cost summary of the current plans in place for Stony Plain is shown in **Table 2.17**. These costs include construction of the West Reservoir and Pumphouse within Stage 3.

Table 2.17: Cost Summary for Current Plans within Stony Plain.

Development Stage	Estimated Year	Cost (\$ M)
Existing System Upgrades	2018	10.9
Stage 1	2028	0.9
Stage 2	2038	4.8
Stage 3	2048	21.3
Ultimate	-	25.9

2.4.4 Parkland County

Future pumping capacity and storage requirements is summarized in **Table 2.18** below.

Table 2.18: Future Pumping and Storage Requirements Within the Acheson / Big Lake Area.

Parameter	Year			
	2018	2025	2043	Ultimate
Equivalent Population (c)	1,352	3,612	4,803	4,923
ADD (L/s)	15.3	66.0	110.0	252.0
MDD (L/s)	30.6	132.0	220.0	503.0
PHD (L/s)	45.9	198.0	329.0	755.0
Truck Fill (L/s)	2.8	12.0	20.0	45.6
Pump Capacity (L/s)	345.0			
Pump Upgrades?	No	No	No	Yes
Storage Required (m ³)	5,603	13,092	17,092	25,092
Storage Capacity (m ³)	13,092			
Storage Upgrades?	No	Yes	Yes	Yes

Notes:

1. Truck fill is not included in ADD, MDD and PHD.
2. Storage Requirements based on fire storage plus two times ADD.
3. Storage requirements for 2025, 2043 and ultimate were provided by Parkland County and supersede the 2015 master plan values.

The following upgrades are completed or are currently planned for the 2025 system:

- ◆ The Zone 4 Reservoir has been upgraded by 5,000 m³ to a storage volume of 13,092 m³ and is currently operational.
- ◆ Five additional PRVs are required to maintain the pressure boundaries.

The following upgrades are currently planned for the 2043 system:

- ◆ The Water Servicing Study recommended that a new Reservoir be constructed in West Acheson Park to meet storage requirements.

The following upgrades are currently planned for the ultimate system:

- ◆ Recommendations were made to upgrade the West Acheson Park reservoir by 15,000 m³ and to construct a new reservoir and pumphouse east of Highway 60 and adjacent to the Zone-4 Reservoir and Pumphouse to meet the storage requirements.
- ◆ Three new PRVs are required to service the ultimate network and maintain the pressure zone boundaries.

A cost summary is provided in **Table 2.19** for each of the growth scenarios.

Table 2.19: Cost Summary for Current Plans in Acheson / Big Lake.

Year	Cost (\$ M)
Existing (2018)	0.0
2025	35.0
2043	16.8
Ultimate (2044+)	56.3

Notes:

1. Assumes a 35 % contingency.

3.0 EXISTING WASTEWATER SYSTEMS

3.1 Overview of Documents Reviewed

The relevant documents reviewed for existing wastewater systems within the Tri-Municipal Region are shown in **Table 3.1**.

Table 3.1: Existing Wastewater Systems – Relevant Background Reports.

Index	Document Title	Document Date	Municipality
N/A	Sanitary Sewer Master Plan, Associated Engineering	September 2013	Spruce Grove
N/A	Spruce Grove Growth Study, ISL Engineering and Land Services	December 2016	Spruce Grove
426	Municipal Development Plan 2010 – 2020	February 2020	Spruce Grove
046	Spruce Grove City Centre Area Redevelopment Plan, Cushing Terrell	January 2018	Spruce Grove
386	Water and Sanitary Master Plan Update, Associated Engineering	March 2019	Town of Stony Plain
304	Acheson and Big Lake Area Sanitary Servicing Study Update, AECOM	October 2016	Parkland County

3.2 Governance

Wastewater systems within the study area includes those owned and operated by the three municipalities and the Alberta Capital Region Wastewater Commission (ACRWC). There are a few exceptions where some municipalities share intermunicipal servicing agreements, or some small hamlets own and operate independent collection and treatment systems and/or septic systems. This is discussed below:

- ◆ **Parkland County** – Own and operate all wastewater sewers, trunks, lift stations, and lagoons within the County. Parkland County also owns and operates two wastewater transfer stations that connect to the ACRWC Wastewater System.
- ◆ **City of Spruce Grove** – Own and operate all wastewater sewers, trunks, and lift stations within the City. The Spruce Grove lagoon is currently being used as a wet weather storage facility to reduce peak flows in the PSTS and is operated by the ACRWC.
- ◆ **Town of Stony Plain** – Own and operate all wastewater sewers, trunks, and lift stations within the Town.
- ◆ **ACRWC** – collect wastewater from Spruce Grove, Stony Plain and the Acheson / Big Lake Area and drains to the ACRWC Parkland Pump Station, which pumps the flows to the St. Albert Regional Trunk (START) system and then the ACRWC Wastewater Treatment Plant.

3.3 Existing Wastewater Infrastructure

3.3.1 Comparison of Existing Wastewater Design Standards

A summary comparison of existing design standards and guidelines is shown in **Table 3.2**. Parkland County has the most conservative residential flow generation rate compared to the other two municipalities. Spruce Grove has the highest standard for non-residential flow generation. All three municipalities use the same formulation to calculate peak factors with different maximum / minimum values. Inflow / infiltration and manhole spacing standards are similar among all three municipalities.

Table 3.2: Comparison of Wastewater Design Standards and Guidelines.

Design Parameter		Municipality		
		City of Spruce Grove	Town of Stony Plain	Parkland County
Dry Weather Flow Generation	Residential (L/c/d)	300	300	350
	Commercial (L/ha/d)	17,280 ¹	11,100 ²	-
	Institutional (L/ha/d)	17,280 ¹	11,100 ²	-
	Industrial (L/ha/d)	17,280 ¹	9,000 ²	6,170
Peaking Factors	Residential (-)	Harmon $\leq 3.5^3$	Harmon $\leq 3.8^3$	Harmon $\geq 2.5^3$
	Non-Residential (-)	3.5	Equivalent Harmon $\leq 3.8^4$	≥ 3.0
Inflow / Infiltration	I/I Rate (L/s/ha)	0.28	0.28	0.28
	Existing Roof Leader / Weeping Tile Connection Allowance (L/s/ha)	-	0.60	-
	I/I Rate at Sag Manholes (L/s)	-	0.40	0.40
Maximum Manhole Spacing (m)		150	120 - 150 ⁵	120 - 150 ⁶

Notes:

1. Based on 0.2 L/s/ha. Higher values are to be used in anticipation of high-water users.
2. Based on equivalent populations of 37 ec/ha for commercial / institutional land uses and 30 ec/ha for industrial land uses.
3. Harmon Equation: $1+14/(4+P^{0.5})$ where $P = \text{pop.} / 1,000$.
4. Equivalent Harmon Equation is based on back-calculation of an equivalent ec/ha value.
5. 120 m spacing for sewers smaller than 600 mm and 150 m spacing for sewers greater than or equal to 600 mm.
6. 120 m spacing for sewers smaller than or equal to 600 mm and 150 m spacing for sewers greater than 600 mm.

3.3.2 ACRWC PSTS

The Alberta Capital Region Wastewater Commission (ACRWC) services municipalities within Parkland County through the Parkland Sewage Transmission System (PSTS). Each of the Tri-Municipal areas operate their own wastewater collection systems that discharge into the PSTS. Sewage is collected within the PSTS and flows to the ACRWC Parkland Pump Station where it is pumped to the St. Albert Regional Trunk (START).

The PSTS is overloaded during extreme storm events and uses the original outfalls to the lagoon to accommodate excess flows. The ACRWC is currently designing a diversion structure from the PSTS to the Spruce Grove Lagoons and a pump station to return stored flows back to the PSTS.

The existing PSTS is shown on **Figure 3.1** along with key lift stations, lagoons, major municipal trunks and overall sewersheds for Spruce Grove, Stony Plain, and Acheson / Big Lake.

Starting in Stony Plain the PSTS ranges from 600 mm to 750 mm between the Town's boundaries. Downstream, the PSTS increases to 1,050 mm near the western edge of Spruce Grove and 1,350 mm at the Acheson / Big Lake Area trunk connection. There are a few points along the trunk alignment that are shallow so servicing additional lands will need to be carefully considered to ensure the risk of flooding to the ground surface is minimized. The PSTS network is shown on **Figure 3.1** and includes major sewersheds within the Tri-Regional Area, pipe size diameters for the PSTS trunk, and locations of major lift stations and lagoons.

The ACRWC is in the process of upgrading its PSTS system capacity from west of Jennifer Heil Way to Century Road in response to growth in Stony Plain and Spruce Grove. To date approximately 3km has been installed between Jennifer Heil Way and Century Road.

3.3.3 Spruce Grove

The City of Spruce Grove consists of four major sewersheds that drain by gravity northwards into the PSTS. The PSTS travels through Spruce Grove along Grove Drive west of Jennifer Heil Way, heads north along Jennifer Heil Way, and then turns east along and then north of Highway 16.

The existing sanitary sewer network for Spruce Grove is shown on **Figure 3.2**. There are five major trunks within the Spruce Grove network which all drain northwards towards the PSTS. These are described below from west to east:

1. **Boundary Trunk:** There is a new trunk being constructed west of Jennifer Heil Way which connects to the PSTS at Grove Drive and Spring Gate. It ranges from a 525 mm trunk to a 600 mm trunk which intends to drain undeveloped areas west of Jennifer Heil Way.
2. **West Trunk:** East of Jennifer Heil Way along Deer Park Boulevard, Grove Drive, Heatherglen Drive, and south of the industrial area, the west trunk collects wastewater from the west side of the City and the industrial area to the south. This trunk ranges from 375 mm in the south to 900 mm just upstream of the connection to the PSTS.

3. **Central Trunk:** The Central Trunk collects wastewater from neighbourhoods and the industrial area bounded by Calahoo Road / Golden Spike Road to the west and Century Road to the east. The Alignment loosely follows King Street south of Grove Drive and green belts and Fairway Drive north of Grove Drive. This trunk ranges from 375 mm south of Grove Drive to 750 mm in the north.
4. **East Trunk:** The East Trunk collects wastewater for the developed areas east of Century Road. The alignment follows Century Road north of Grove Drive and weaves through Grove Meadows and Lakewood neighbourhoods to the south of Grove Drive. Most of this trunk is 375 mm but increases in size to 600 mm where it crosses Highway 16.
5. **Pioneer Road Trunk:** Pioneer Road Trunk follows the alignment of Pioneer Road and ranges from 750 – 900 mm in size. This trunk is intended to convey wastewater for the areas east of the East Trunk sewershed and the future annexation areas to the southeast.

These five areas service the lands south of the PSTS. Since the ground slopes northeast, any development north of the existing PSTS alignment will generally require lift stations.

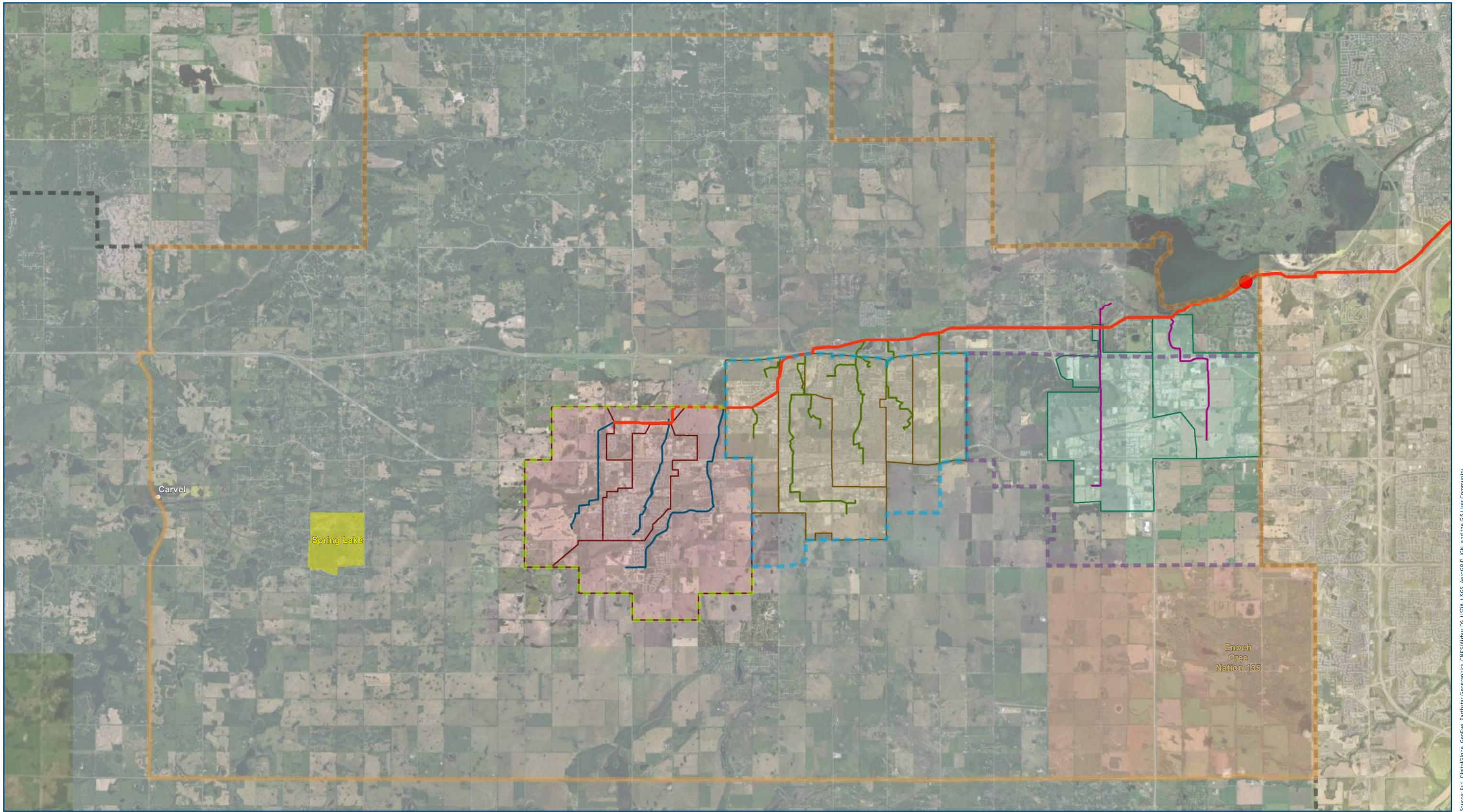
3.3.4 Stony Plain

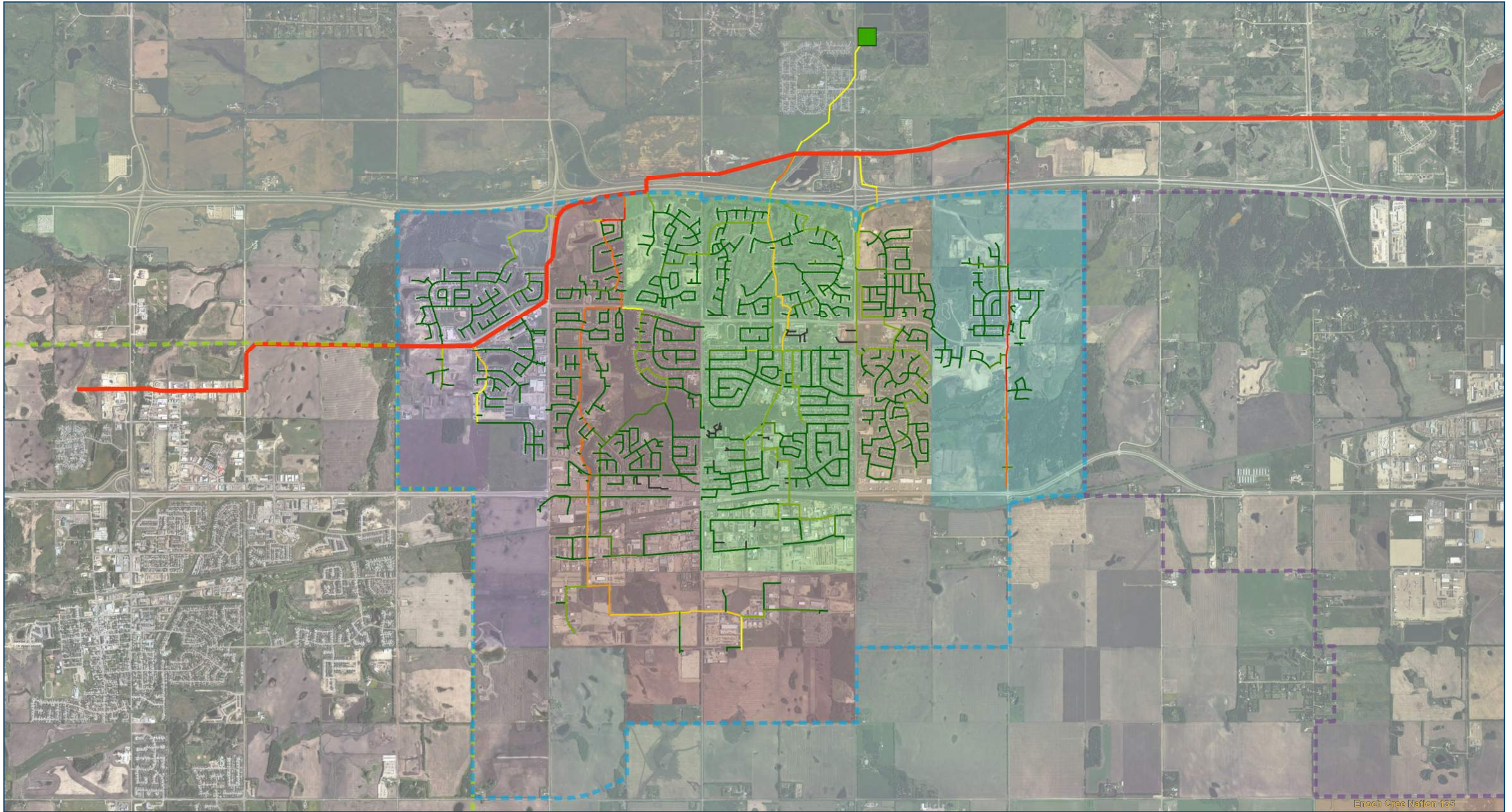
The existing Stony Plain wastewater network consists of four major trunks and associated sewersheds. These are described below and shown on **Figure 3.3**.

1. **The West Trunk:** The west trunk ranges from 375 – 900 mm in size. The trunk maintains 900 mm north to south with the west branch being 375 – 450 mm in size. Currently, a small development west of Downtown drains into this trunk. The rest of the capacity within this trunk is dedicated to future development in the west.
2. **The Central Trunk:** The Central Trunk is almost fully developed and experiences surcharging during wet weather events. The trunk ranges from 400 mm in the south to 600 mm where it ties into the PSTS. There are three low-pressure systems that drain to the central trunk including two areas of industrial development along Boulder Boulevard, and the commercial development near 50 Street, bounded by Highway 16 and the CN Railway.
3. **The East Trunk:** The East Trunk ranges from 600 – 1,050 mm in size and collects wastewater from West of Golf Course Road and South of the quarter section line dividing the east and central catchments. Neighbourhoods to the south serviced by this trunk include Willow Park, High Park, and Lake Westerra Estates. This sewershed is still developing.
4. **The Meridian / North Sewershed:** There is no dedicated Meridian / North Trunk since the flows drain by gravity directly into the PSTS. There are two sub trunks, one drains Meridian Meadows by gravity via a 250 mm sewer and the other services the industrial area near Goertz Avenue by a 100 mm low-pressure system and 300 mm sewer.

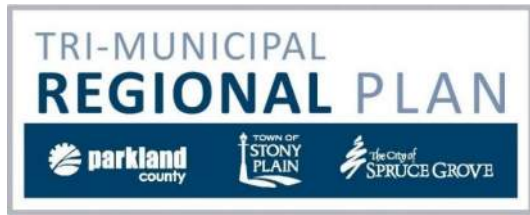
There are four major lift stations within the Town which are listed below:

1. North Business Park Lift Station,
2. Southridge Lift Station,
3. Country Plains Estates Lift Station, and
4. Quance Lift Station.





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0 0.325 0.65 1.3 1.95 2.6 km
Coordinate System: CANA83-3TM114

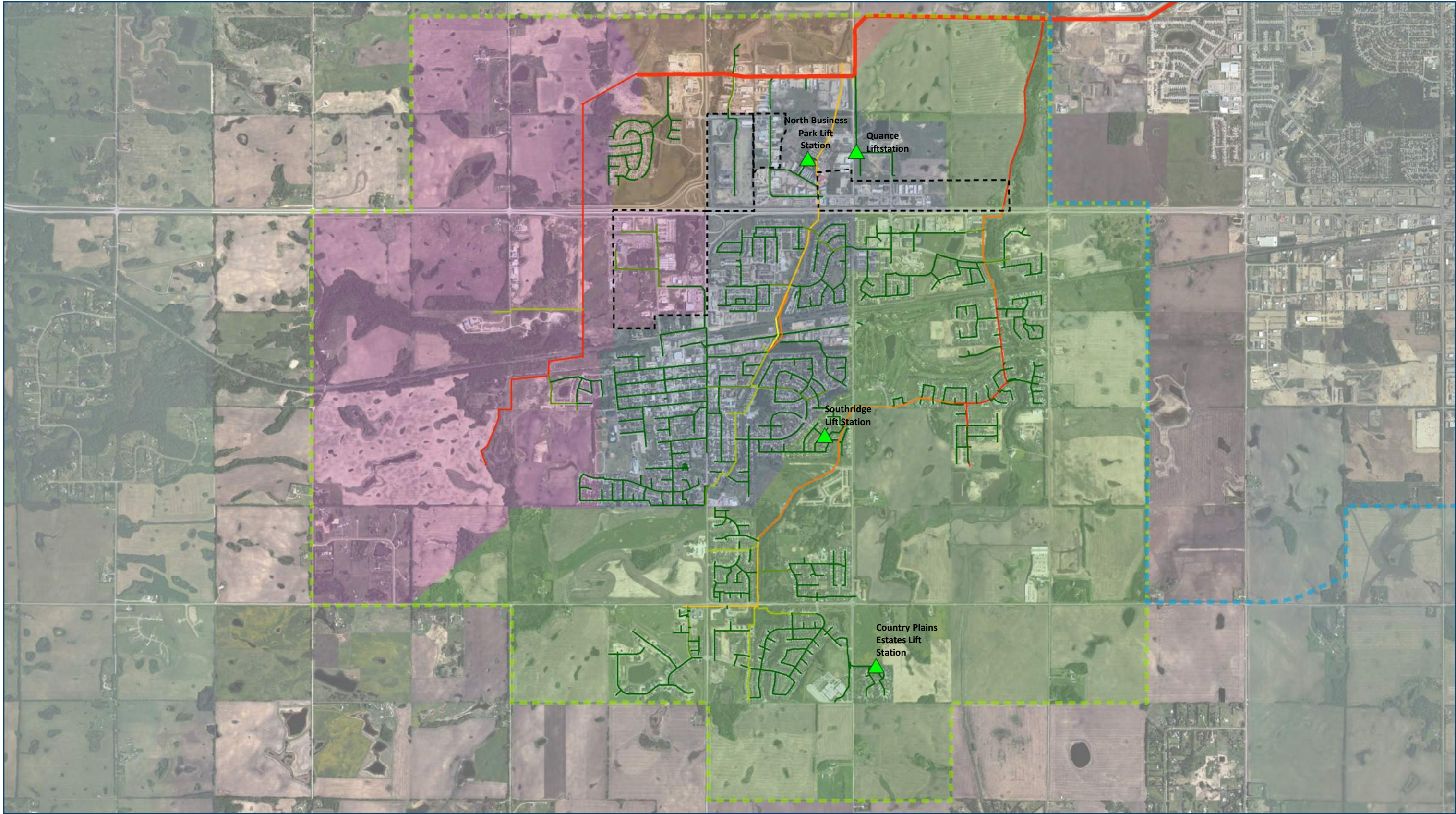


- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial Area
- ACRWC System
- Former Spruce Grove Lagoon

- Sewershed**
- Boundary
 - Central
 - East
 - Pioneer (Future)
 - West

- Sanitary Sewer**
- Unknown
 - ≤ 250 mm
 - 300 mm
 - 350 - 375 mm
 - 400 - 450 mm
 - 500 - 525 mm
 - 600 mm
 - 675 mm
 - 750 mm
 - ≥ 900 mm

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY
FIGURE 3.2
SPRUCE GROVE
WASTEWATER NETWORK



3.3.5 Parkland County

The Acheson Industrial area was initially designed and constructed in 1995 and the system connects to the PSTS. The existing sanitary sewer network is shown in detail on **Figure 3.4** along with estimated sewersheds for the two major trunks within the area. The existing sanitary network flows northwards by gravity through two main trunks:

1. **Acheson Trunk:** The Acheson Trunk is located along the west side of Range Road 264 and conveys wastewater north from west of Highway 60. This trunk ranges from 200 mm to 675 mm in size. The PSTS is 1,350 mm at the connection point of this trunk.
2. **The Bevington Trunk:** The Bevington Trunk was constructed in 2007 along Bevington Road (Range Road 264) and services the area east of Highway 60. This trunk ranges from 450 mm to 750 mm in diameter with majority of the length being 600 mm. This trunk ties into a smaller 525 mm diameter trunk in Lake Ridge Estates.

Both trunks flow by gravity into the PSTS which conveys the flows to the Parkland Pump Station, located in Lakeshore Estates.

There are two lift stations located within the Acheson Industrial Area:

1. **Conzor Lift Station:** Located north of Highway 16A and south of CNR, the Consor Lift Station services some of the West Acheson Industrial Area.
2. **Zone 5 Lift Station:** Located south of Highway 16A along Range Road 264, the Zone 5 Lift Station services a small area to the south of the industrial area.

The Big Lake residential area mostly has direct connections to the PSTS; however, Grandin Estates, Green Briar Estates, and part of Walker Lake, all of which are located at the northern end of Range Road 264, are low-pressure wastewater systems.

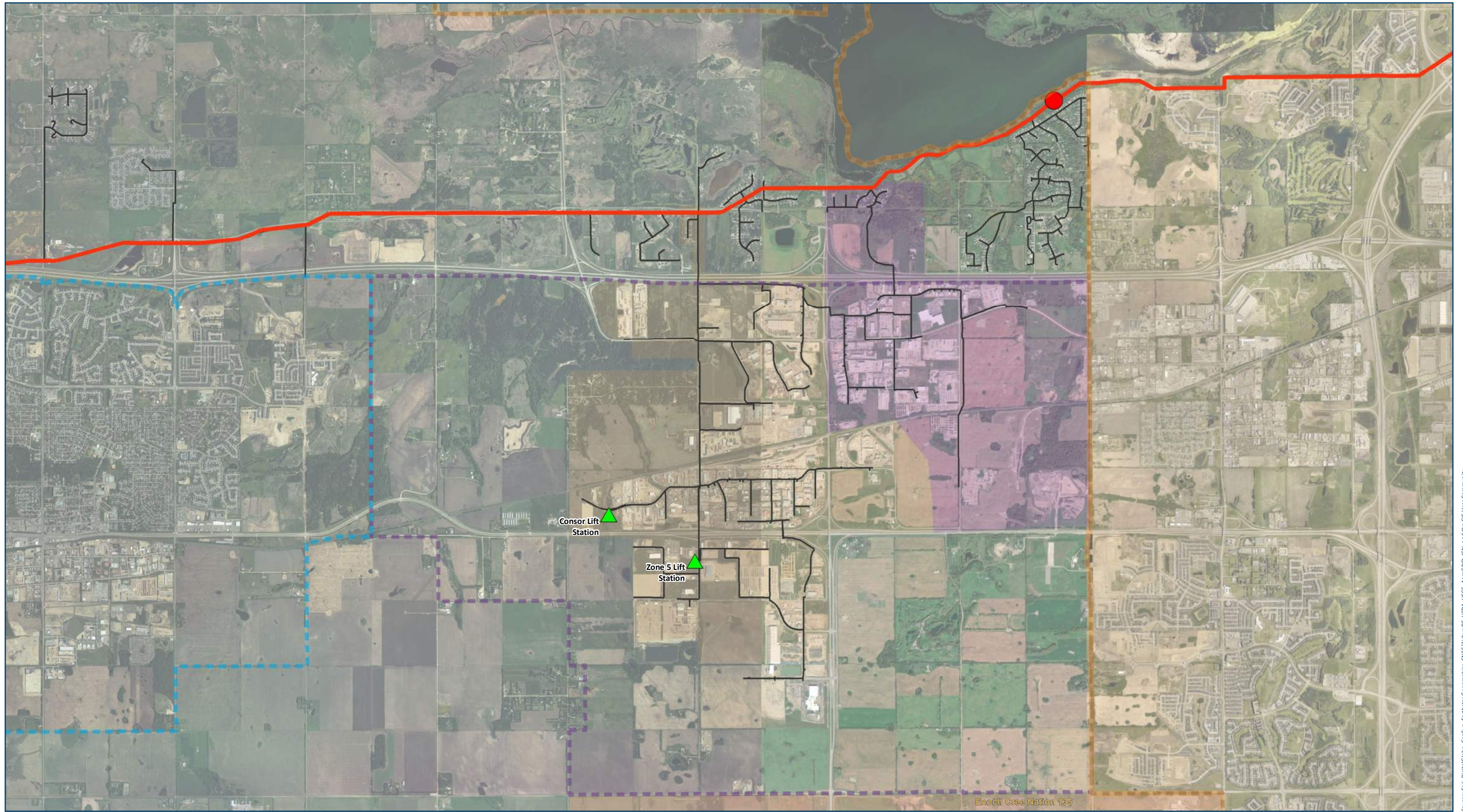
3.4 Current Plans

3.4.1 ACRWC PSTS

The PSTS currently experiences large increases in flow during wet weather periods, limiting the capacity. Thus far, the ACRWC has begun to utilize Morinville lagoons for wet weather flow storage and is proposing a similar arrangement for the inactive Spruce Grove lagoons which are located north of Spruce Grove within Parkland County. The design and construction of the diversion structure to utilize the Spruce Grove lagoon for wet weather storage is currently underway. Along the PSTS alignment, the existing 750 mm trunk has been twinned with a 1,200 – 1,350 mm trunk from the Jennifer Heil Way crossing (south of Highway 16) to the service road just northwest of the intersection of Century Road and Highway 16.

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Date: 2021-03-26



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

TRI-MUNICIPAL
REGIONAL PLAN

Coordinate System: CANA83-3TM114

Tri-Municipal Plan Prime Area of Focus

Acheson Industrial Area

Parkland County

City of Spruce Grove

First Nation

ACRWC System

Sanitary Sewer

ACRWC Parkland Pump Station

Lift Station

Sewershed

Acheson Trunk

Bevington Road

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 3.4

ACHESON/BIG LAKE
WASTEWATER NETWORK

3.4.2 Spruce Grove

The Spruce Grove Sanitary Master Plan (2012) recommended several local upgrades to resolve flooding risks within the Central Trunk Catchment. Based on the GIS database, these upgrades have not been completed yet; however, the plan indicates that flow monitoring has been recommended and the Phase 1 Brookwood upgrades are under construction.

Twinning of the East Trunk along Century Road from Kings Link / Vanderbilt Common to Highway 16 has been completed. Lastly, upgrading to the ACRWC PSTS recommended in this study has been completed.

Table 3.3 shows a summary of the overall cost estimates to resolve local flooding concerns and to expand the network for ultimate development.

Table 3.3: Summary of Ultimate Development Sanitary Costs within Spruce Grove.

Item	Cost (\$M)
Local Upgrades	4.8
Future Sewer Expansions	28.1
Total Ultimate Network	32.9

Notes:

1. Cost estimates presented in Table 3.3 are from Table ES 1 from the 2012 Sanitary Sewer Master Plan.

3.4.3 Stony Plain

To resolve local flooding concerns caused by sewers surcharging in the manholes up to the rim and ground surface, Stony Plain is pursuing the construction of a Super Pipe along Brown Street from 52 Avenue to 49 Avenue. This super pipe would be approximately 500 m of 1,500 mm pipe with a 250 mm orifice at the downstream end to restrict flows from surcharging downstream.

Future development within Stony Plain primarily consists of the following:

- ◆ Build out of the West Trunk Sewershed,
- ◆ Build out of the East Trunk Sewershed,
- ◆ Sealing of manholes and weeping tile disconnections to reduce I/I contributions,
- ◆ Flow Monitoring at two locations along the Central Trunk, one location at the downstream end of the East Trunk, and installation of a rain gauge west of the intersection of Brown Street and 49 Avenue to meet future monitoring requirements of ACRWC's Wet Weather Flow Management Strategy, and
- ◆ Abandonment of the Country Plains Lift Station as this area is diverted by gravity to the ultimate network.

Table 3.4 summarizes the cost estimates for development of the ultimate network within Stony Plain.

Table 3.4: Ultimate Development Cost Estimates for Stony Plain Sanitary Network.

Item	Cost (\$M)
Existing System Upgrades / Super Pipe	3.2
Stage 1 (2028)	2.6
Stage 2 (2038)	6.2
Stage 3 (2048)	0.9
Ultimate (2048+)	11.1
Total	24.0

3.4.4 Parkland County

Within the Acheson / Big Lake area, plans from the Acheson and Big Lake Area Wastewater Servicing Study Update, 2016, included development in the industrial area to the south and the east, and development on the west side of the Wagner natural area. South of the CNR, most of the future development is in a topographical low point and thirteen new lift stations are required to service the lands to the south and to the east. For more information on plans from previous studies, see **Figure 4.1** from the Acheson and Big Lake Area Servicing Study Update, 2016. Upgrades and extensions to both the Acheson and Bevington Trunk are anticipated to convey ultimate flows.

To the west of the Wagner Natural Area, a newly proposed Atim Road Trunk has been proposed. This trunk is approximately 5,400 m long and ranges from 200 mm to 525 mm in size and connects directly to the PSTS.

A cost summary which includes system upgrades, new trunks, and new lift stations is provided in **Table 3.5**.

Table 3.5: Ultimate Development Cost Estimates for Acheson / Big Lake Sanitary Network.

Time Frame	Cost (\$M)
Existing System	1.3
Near Future	3.4
Long Term	9.6
Ultimate Network	28.7
Total	43.0

4.0 EXISTING STORMWATER SYSTEMS

4.1 Overview of Documents Reviewed

The relevant documents reviewed for existing storm water systems are shown in **Table 4.1**.

Table 4.1: Existing Stormwater Systems – Relevant Background Reports.

Index	Document Title	Document Date	Municipality
463	Stormwater Master Plan Update, Associated Engineering	October 2015	Spruce Grove
N/A	City of Spruce Grove: Stormwater Utility Funding Review, Corvus Business Advisors	June 2019	Spruce Grove
N/A	Spruce Grove Growth Study, ISL Engineering and Land Services	December 2016	Spruce Grove
459	Boundary Interface Planning Study, Dillon Consulting	July 2007	Spruce Grove
426	Municipal Development Plan 2010 – 2020	February 2020	Spruce Grove
046	Spruce Grove City Centre Area Redevelopment Plan, Cushing Terrell	January 2018	Spruce Grove
332	Stormwater Master Plan, Sameng Inc.	April 2019	Stony Plain
465	Town of Stony Plain Flood Mitigation Program, Sameng Inc.	May 2020	Stony Plain
330	Acheson / Big Lake Area Master Drainage Plan – Amendment, AECOM	August 2011	Parkland County
N/A	Acheson / Big Lake Basin 1 Storm Design Preliminary Design Report, ISL Engineering and Land Services	January 2013	Parkland County
N/A	Acheson / Big Lake Basin 1 Stormwater Summary Report	March 2018	Parkland County

4.2 Governance

There are not many intermunicipal stormwater agreements within the study area; however, there are a few smaller scale intermunicipal servicing agreements.

There is an intermunicipal agreement between Spruce Grove and Parkland County to drain a constructed storm pond on the east side of Century Road and south of Highway 16 underneath Highway 16 which discharges into a County road allowance (along Township Road 532A). Operation, maintenance and lifecycle replacement are the responsibility of Spruce Grove.

The 2004 Big Lake Water Management Study, completed by Edmonton, St. Albert, Spruce Grove, Stony Plain, Parkland County and Sturgeon County, established pre-development discharge rates to be used by each municipality for approval by Alberta Environment and Parks (AEP) when proposing a new

stormwater system. The Associated Engineering Big Lake Study, 2004, recommended for 2.5 L/s/ha north of Highway 16A and 1.8 L/s/ha south of CNR (Dog Creek).

The EMRB recently completed the Terms of Reference for the Metropolitan Regional Servicing Plan (MRSP) which had stormwater servicing as one of the regional priorities moving forward. The MRSP recommended the following next steps:

- ◆ Develop common stormwater terminology, measures, indicators and criteria for prioritization of stormwater management funding,
- ◆ Gather and organize a database of regional stormwater data, monitoring records, and reports,
- ◆ Conduct an environmental scan of regional water bodies and water courses including monitoring,
- ◆ Evaluate risks associated with current practices,
- ◆ Consider design standards, sedimentation and erosion when evaluating projects,
- ◆ Advocate regional discussions for maintaining water quality and design standards, and
- ◆ Evaluate opportunities for regional level stormwater management investments.

4.3 Existing Stormwater Infrastructure

4.3.1 Comparison of Existing Stormwater Design Standards

A summary comparison of existing design standards and guidelines is shown in **Table 4.2**. Most of the stormwater management design standards are similar with the exception of a few runoff coefficients in Parkland County which are expected. Pre-development rates are assumed to be 2.5 L/s/ha everywhere other than the Dog Creek Basin based on the Big Lake 2004 Study.

Table 4.2: Comparison of Stormwater Design Standards and Guidelines.

Design Parameter		Municipality		
		City of Spruce Grove	Town of Stony Plain	Parkland County
Design Flow Rate for Stormwater Runoff (m ³ /s) ¹		Q = CIA/360	Q = CIA/360	Q = CIA/360
Runoff Coefficients	Grassed Areas / Parks	0.10	0.10 - 0.25	0.05 - 0.35
	Low-Density Residential	0.55	0.40 - 0.60	0.10 - 0.30
	Medium-Density Residential	0.60	0.60 - 0.75	-
	High-Density Residential	0.65	0.50 - 0.70	0.25 - 0.50
	Industrial	0.60	0.50 - 0.90	0.25 - 0.50
	Commercial	0.70 - 0.90	0.50 - 0.95	-
	Institutional	-	-	-

Design Parameter		Municipality		
		City of Spruce Grove	Town of Stony Plain	Parkland County
	Pavement / Roof Areas	0.95	0.70 - 0.95	0.90 - 0.95
Design Storms	Minor System	1:5-Year Design Storm	1:5-Year Design Storm	1:5-Year Design Storm ²
	Major System	1:100-Year Design Storm	1:100-Year Design Storm	100-Year storms (4-hr & 24-hr), 120 mm of runoff, and 1937, 1978, 1988 historical events.
Inlet Time (minutes)		<= 10	5.0 - 10.4 ³	Equal to Design Storm Duration
Pre-development Rates (L/s/ha)		1.8 - 2.5 ⁴	2.5	0.6 – 2.5
Total Suspended Solids Reduction		85% for particles >= 75 um	-	-

Notes:

1. Rational formula in cubic metres per second with I = intensity (mm/hr), A = area (ha), and C = runoff coefficient (-).
2. Based on minimizing inconveniences and preventing property damage.
3. Inlet Time is dependent on imperviousness and catchment area size.
4. Maximum release rates within Spruce Grove are limited to 1.8 L/s/ha within Dog Creek and 2.5 L/s/ha elsewhere based on Big Lake Study (2004).

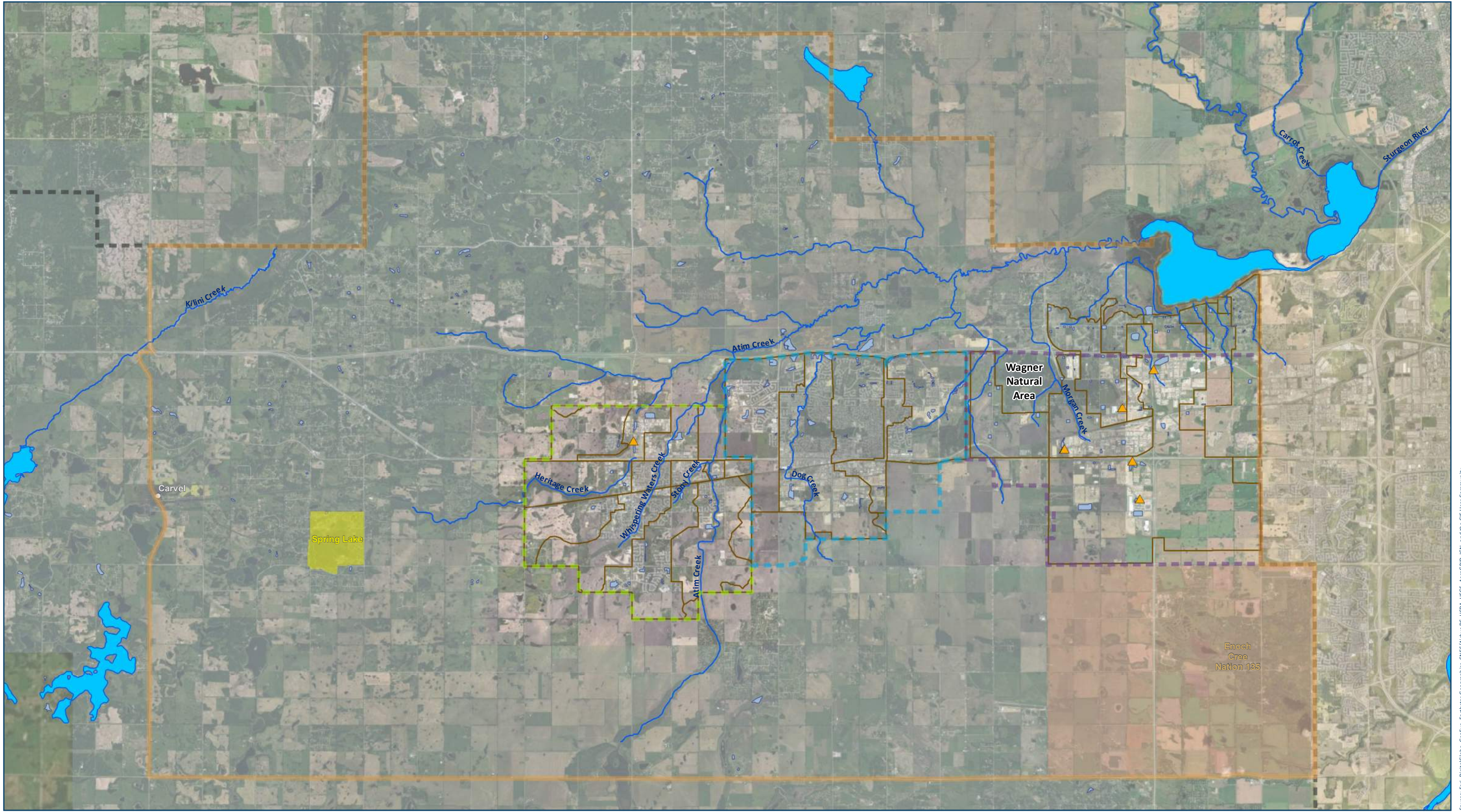
4.3.2 Tri-Municipal Region Drainage Overview

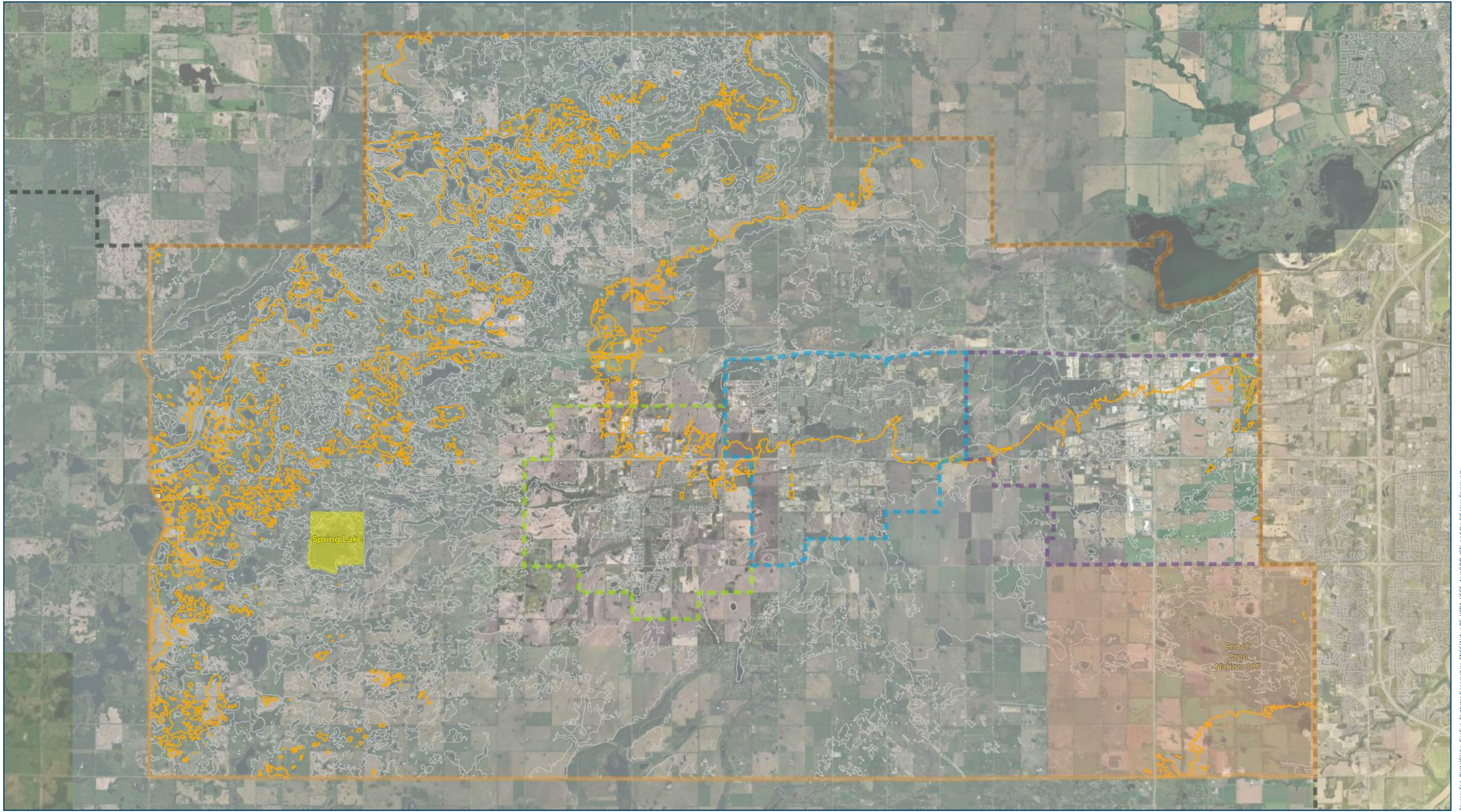
The Tri-Municipal Region resides within the Sturgeon River watershed and overland flow drains north and east towards Big Lake. This implies that runoff from Parkland County crosses into Stony Plain and Spruce Grove from the southwest and leaves the municipalities from the northeast.

Major overland drainage courses within the Tri-Municipal area include:

- ◆ Heritage Creek,
- ◆ Whispering Waters Creek,
- ◆ Stony Creek,
- ◆ Atim Creek,
- ◆ Dog Creek,
- ◆ Morgan Creek, and
- ◆ Wagner Natural Area.

Major catchments, overland drainage courses and other drainage features are shown on **Figure 4.1** for the Tri-Municipal Region. Overland topography is shown for the Tri-Municipal region on **Figure 4.2**.





4.3.3 Spruce Grove

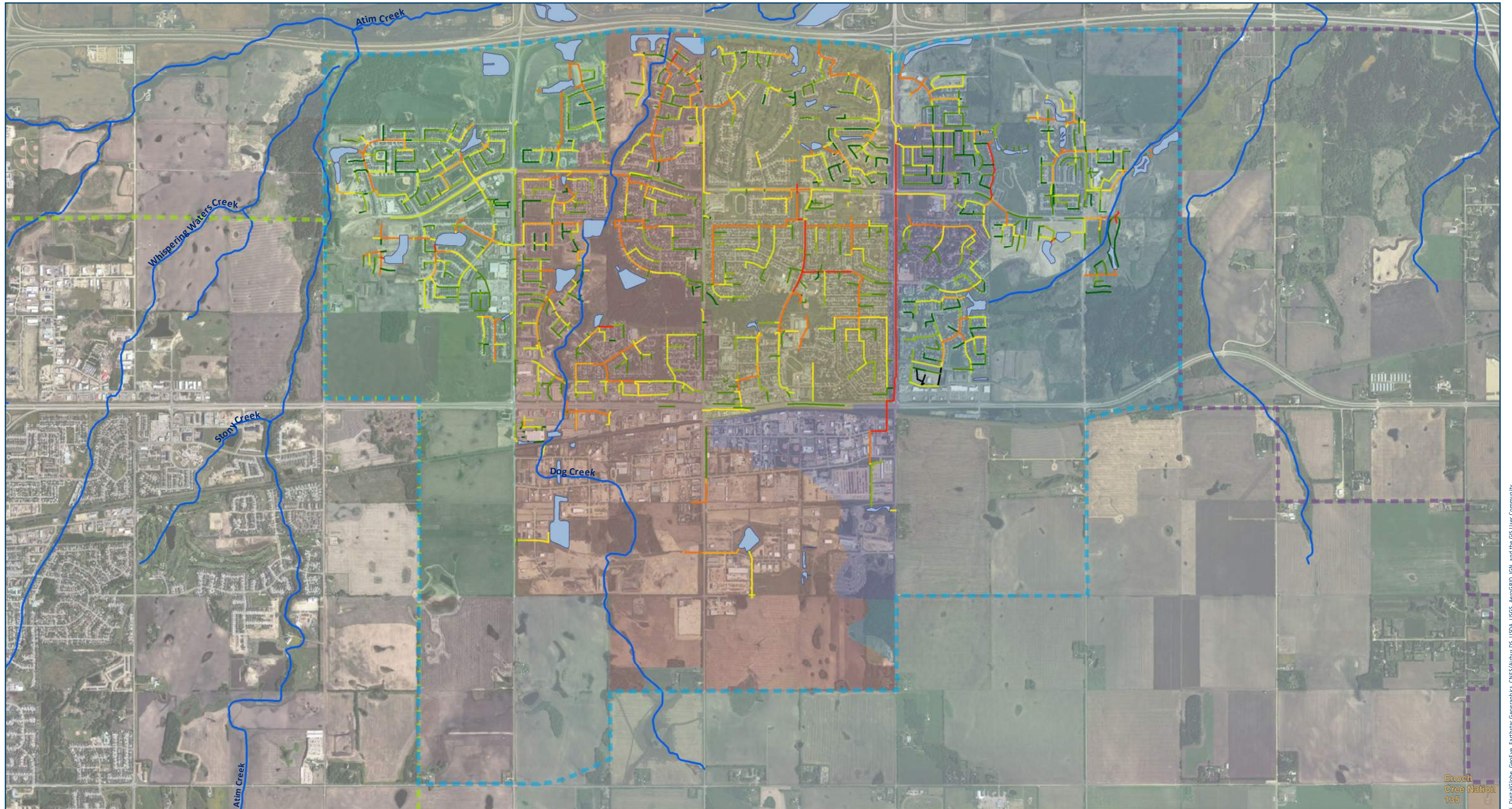
Spruce Grove is made up of five major catchments that drain northwards towards Highway 16:

1. **Atim Creek Drainage Basin:** The Atim Creek Drainage Basin includes all the lands that drain to Atim Creek within the City of Spruce Grove limits. Flows within Atim Creek continue from upstream and drain through the City. This catchment is roughly bounded to the east by Deer Park Boulevard north of Grove Way and Jennifer Heil Way south of Grove Drive and is approximately 790 ha in size.
2. **Dog Creek Drainage Basin:** The Dog Creek Drainage Basin is bounded roughly by Jennifer Heil Way to the west and Calahoo Road to the east north of Highway 16A but widens within the Industrial Area to the south. The overall catchment is approximately 1,000 ha within the City; however, there is a large upstream basin which drains through Dog Creek and the City. There are currently flooding risks within the Dog Creek Drainage Basin due to undersized culverts and high peak flows from the upstream industrial area.
3. **King Street Drainage Basin:** The King Street Drainage Basin is bounded by Calahoo Road, Century Road, Highway 16 and Highway 16A with an overall area of approximately 510 ha.
4. **Century Road Drainage Basin:** The Century Road Drainage Basin collects runoff from along the Century Road ROW, Spruce Village and Grove Meadows neighbourhoods, and the northeast corner of the industrial area south of Highway 16A. The overall drainage basin area is approximately 230 ha.
5. **East Spruce Grove Drainage Basin:** The East Spruce Grove Drainage Basin is mostly undeveloped and is bounded by Century Road to the west less the Spruce Village and Grove Meadows neighbourhoods. There is one existing outlet as mentioned in Section 4.2 through a pipe that crosses underneath Highway 16, along Range Road 272, and outlets in the ditch of Township Road 532A. Parkland County and Spruce Grove have a signed intermunicipal agreement for this outlet. The overall drainage area is approximately 710 ha.

The major catchments, overland drainage courses, stormwater management facilities (SWMFs) and minor system for the City of Spruce Grove is shown on **Figure 4.3**. Overland topography for the City of Spruce Grove is shown on **Figure 4.4**.

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Date: 2021-03-26



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



0 0.25 0.5 1 1.5 2 km
Coordinate System: CANA83-3TM114



- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial Area
- Stormwater Management Facility
- Water Course

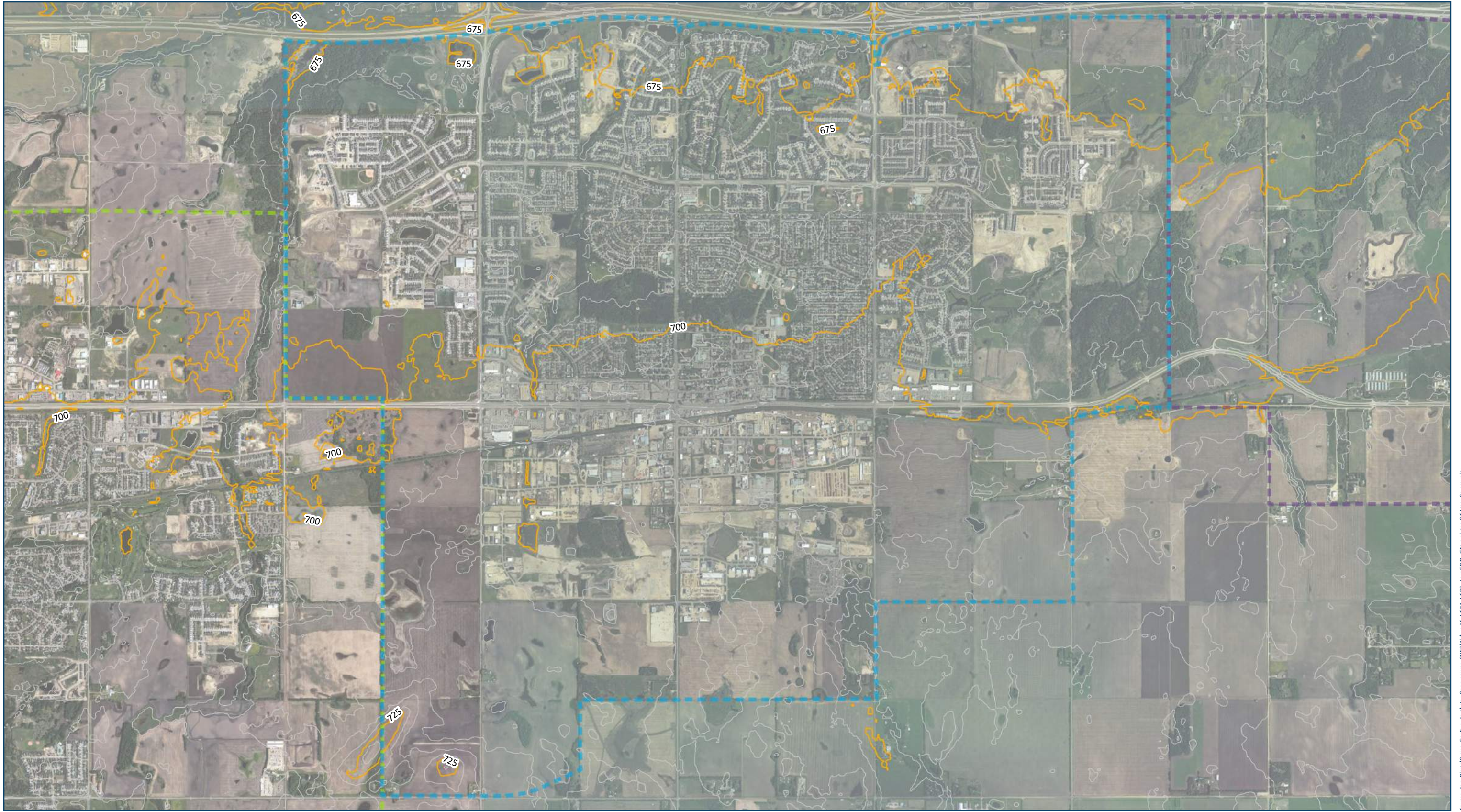
Drainage Basins

- Atim Creek
- Century Road
- Dog Creek
- East Spruce Grove
- King Street

Stormwater Main

- Unknown
- ≤ 250 mm
- 300 mm
- 350 - 375 mm
- 400 - 525 mm
- 600 mm
- 675 - 750 mm
- 900 - 1200 mm
- ≥ 1350 mm

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY
FIGURE 4.3
SPRUCE GROVE
STORMWATER NETWORK



4.3.4 Stony Plain

Stony Plain is separated into several catchments which drain to one of the following water courses:

1. **Heritage Creek:** The catchments that drain to Heritage Creek consist of the area that is bounded by CNR, Meridian Road, and the industrial area near the north end of Town. Within the City limits, approximately 582 ha of land can potentially drain to this creek. Upstream, there is 4,367 ha of County land that drains into the Creek.
2. **Whispering Water Creek:** The catchments that drain to Whispering Waters Creek cut right through the middle of the Town. These catchments include portions of The Glens, Woodlands, Southridge, Meridian Heights, Saint Andrews, downtown and the Homesteads neighbourhoods. The overall catchment area within the Town boundaries is approximately 811 ha. Upstream of the Town boundaries, there is 156 ha of Parkland County that drains into this creek.
3. **Stony Creek:** The catchments that make up the Stony Creek drainage basin within the Town include portions of the Lake Westerra, Willow Park, High Park, Southridge, Stony Plain Golf Course and Homesteads neighbourhoods. The overall drainage area within the Town is 645 ha. Upstream, there is 696 ha of Parkland County that drains into Stony Creek.
4. **Atim Creek:** The catchments that drain to Atim Creek are along the east side of the Town boundary and are largely undeveloped. The total area within the Town boundaries is approximately 775 ha of land and includes the Fairways and Graybriar neighbourhoods. Upstream of the Town, there is 1974 ha of land draining into the Creek from Parkland County.

Outside of these four major creeks, there is at 724 ha of land within the Town boundaries that runs off to the northeast or drains to small unnamed creeks.

Major catchments, overland drainage courses, SWMFs and the minor system for the Town of Stony Plain is shown on **Figure 4.5**. Overland topography for the Town is shown on **Figure 4.6**.

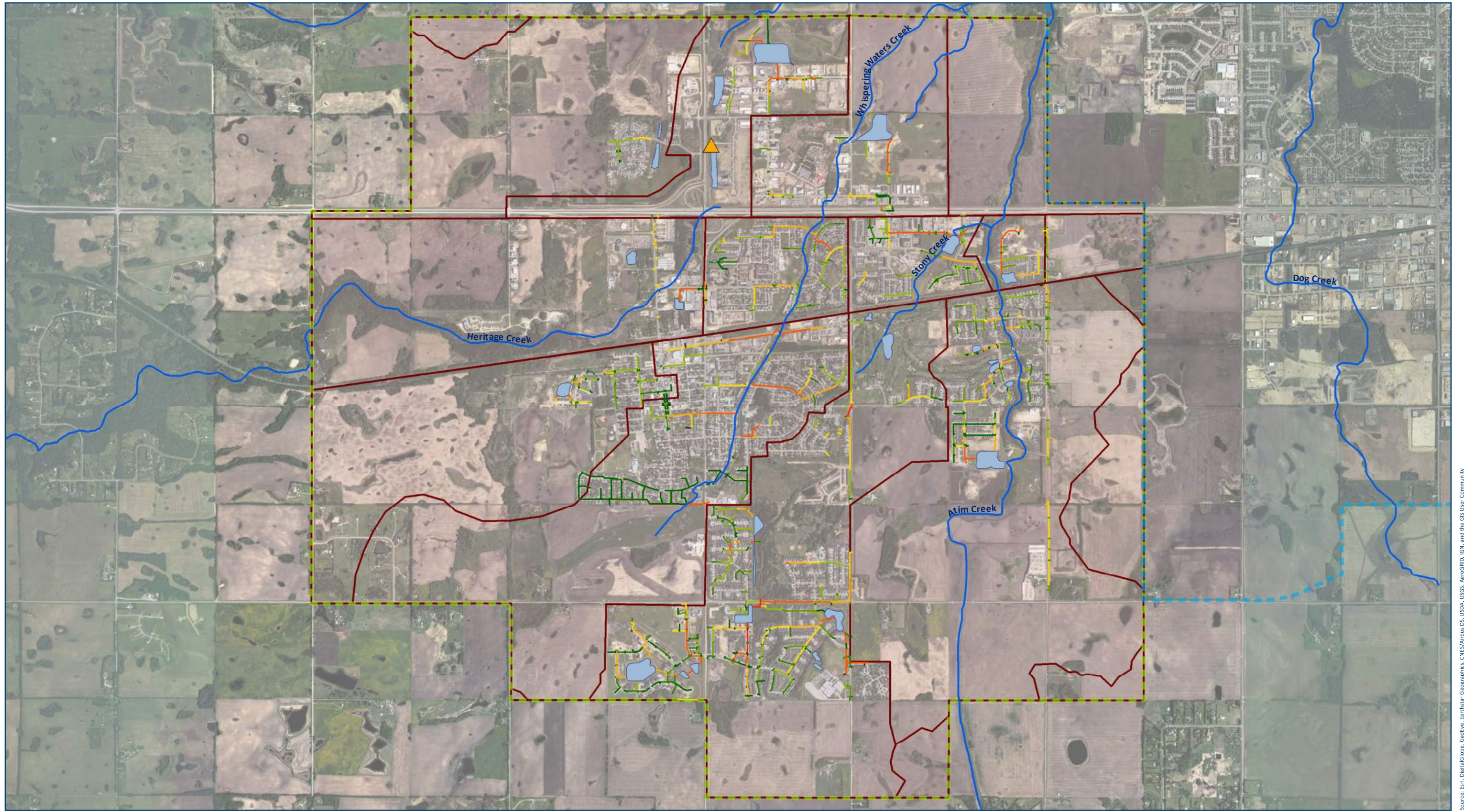
4.3.5 Parkland County

Within Parkland County's Acheson / Big Lake Area, there are several wetlands present which require appropriate protection and/or compensation prior to development. This includes the Wagner Natural Area to the east of Acheson. This area and corresponding recharge zone to the south are sensitive to development due to sand channels underground that create constraints to development.

Within the Acheson / Big Lake area, there are a few drainage paths that overland drainage generally follows including Morgan Creek along the west side of the industrial area which drains towards the Wagner Natural Area. Near the central industrial area, flows drain north within the Highway 60 ditches.

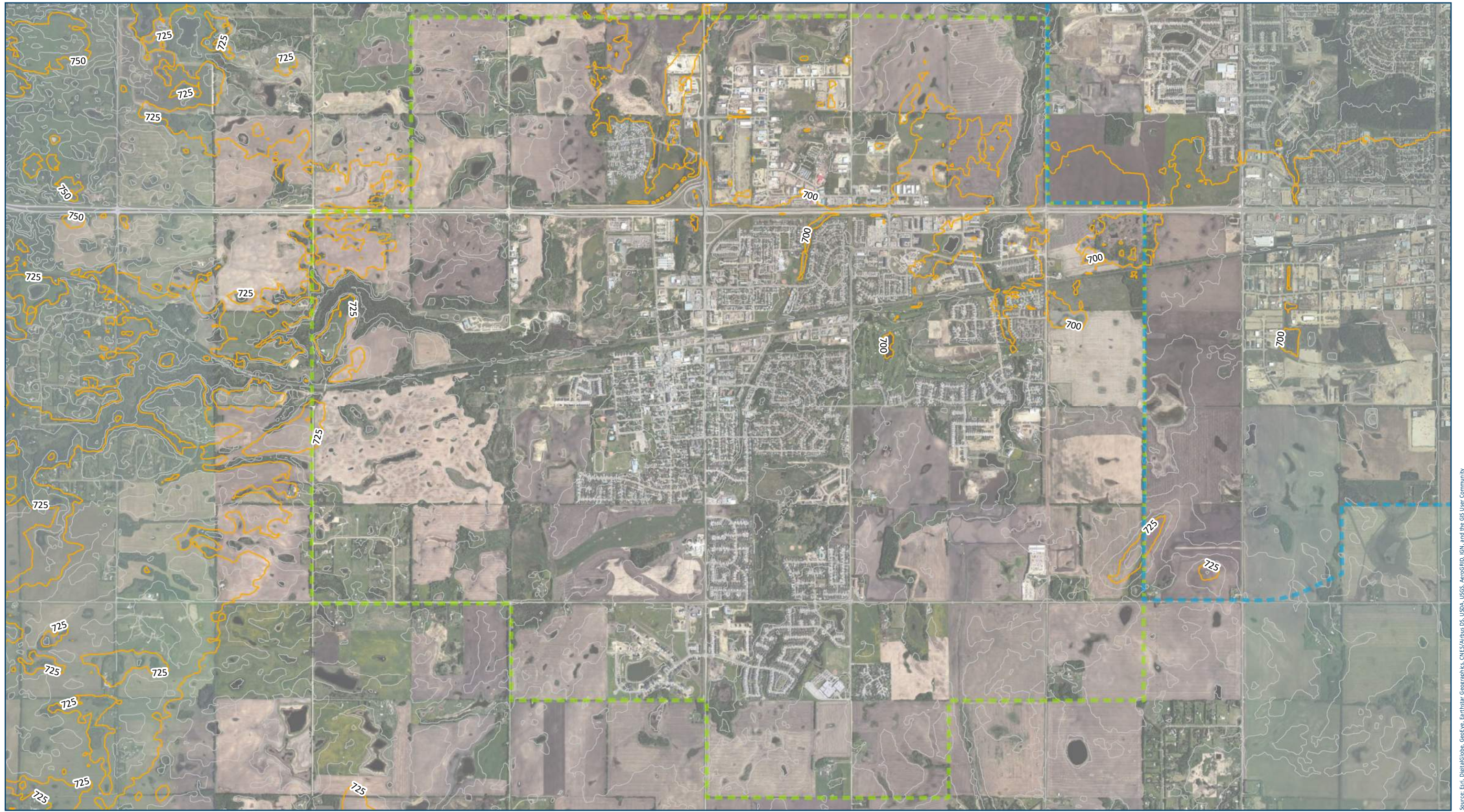
The storm network consists of mostly local storm sewers that connect between SWMFs to control runoff in the industrial area. There is a 500 mm forcemain along 96 Avenue that turns north on Highway 60 and drains to Big Lake through trunks ranging from 900 mm to 1,200 mm. This trunk was extended to the south in 2018 and now connects to 92 Avenue.

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Date: 2021-03-26



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

Date: 2021-03-26 Document: \\edms3\GIS\15739_Trans_Uilities_and_Infra_Strategy\02_CADD\25_GIS\251_Figures\15739_Base_Template_200903.mxd



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

Major catchments, overland drainage courses, SWMFs and the minor system for the Acheson / Big Lake area are on **Figure 4.7**. Overland topography for the County is shown on **Figure 4.8**.

4.4 Current Plans

4.4.1 Spruce Grove

The City of Spruce Grove is currently planning for the following based on the 2015 Stormwater Master Plan:

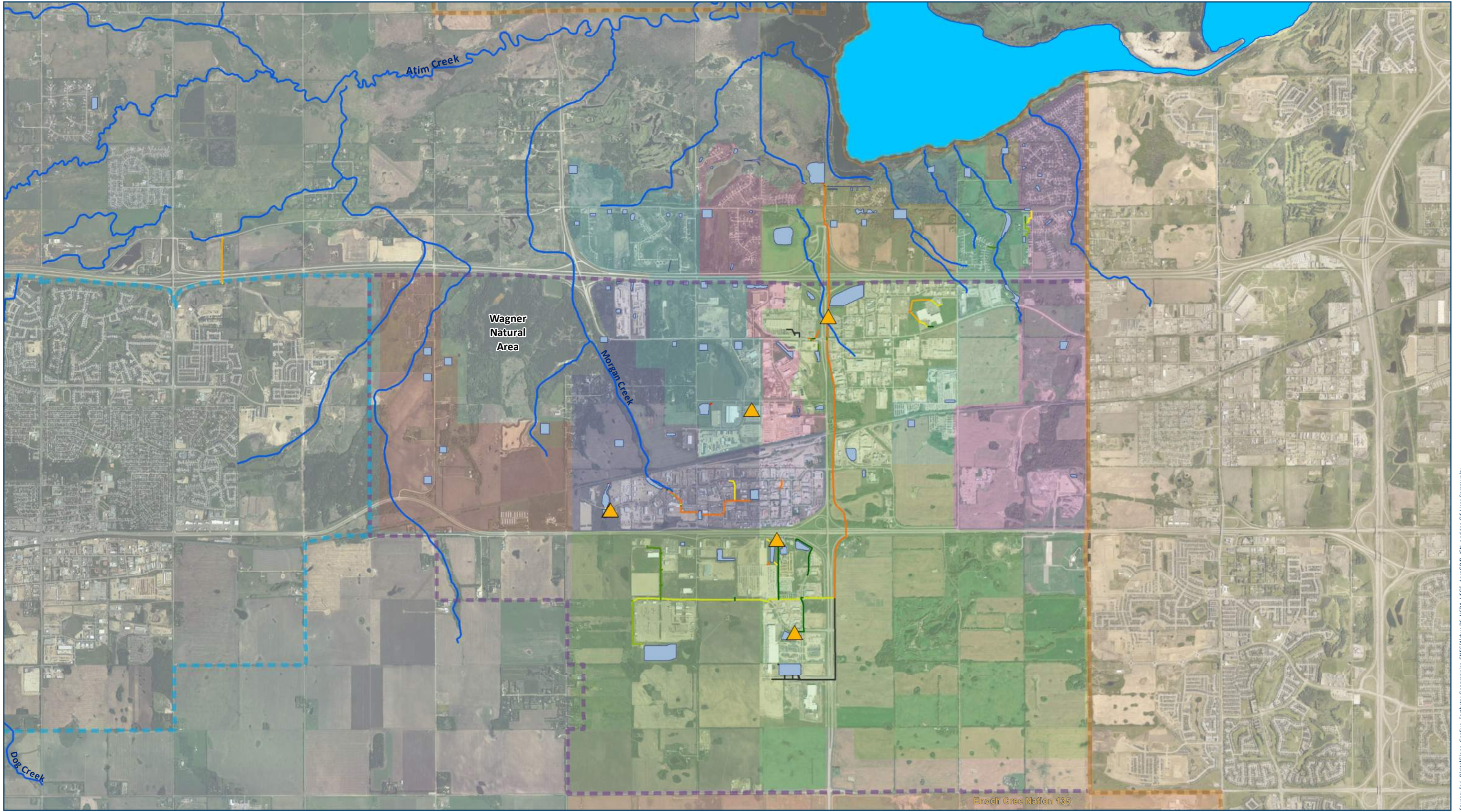
- ◆ All development in the Dog Creek basin south of the CNR will be restricted to a release rate of 1.8 L/s/ha and all other development will be restricted to a release rate of 2.5 L/s/ha.
- ◆ The industrial area to the south is currently undergoing upgrades to the ditch and culvert network to improve local flooding concerns due to poorly defined ditch channels and undersized / damaged culverts.
- ◆ Within the Atim Creek Basin on the west edge of the City, a series of seven SWMFs with interconnected storm trunks / drainage ditches is intended to convey flows north through existing ponds and drainage pathways towards Highway 16 and existing Spruce Grove drainage outlets.
- ◆ The Dog Creek Basin will be further developed in the industrial area south of Highway 16A and will have a series of 11 SWMFs to control flows. As the industrial area develops, special care will need to be given since there is a lot of natural ponding and flow attenuation south of Highway 16A, and development and infill will reduce this natural attenuation and increase the peak flows experienced within Dog Creek which is already known to have limited capacity.
- ◆ The East Spruce Grove Basin will further develop and include 20 SMWFs with two storm trunks interconnecting ponds south of Highway 16A and a drainage ditch connecting ponds north of Highway 16A.
- ◆ The 2015 Stormwater Master Plan also recommended the construction of a ditch on the east side of Century Crossing Commercial and Lakewood subdivisions.
- ◆ Retain an overflow route along the east ditch of Century Road.
- ◆ To ensure CNR & Highway 16A culverts are not further overloaded, all culverts crossing Highway 628 need to be limited to 2.2 m³/s.

Most of the existing minor system has capacity to convey flows from the 5-year, 4-hour design storm, but the overland network showed several risks of ponding > 0.3 m throughout the City during the 100-year, 4-hour design event. The 2015 Stormwater Master Plan for Spruce Grove estimated \$5.4M in existing system upgrades to address several ponding issues and risks.

4.4.2 Stony Plain

Most of the storm network deficiencies are related to overland drainage and risks of ponding / flooding within downtown and near the major drainage courses, especially Whispering Waters Creek. Upgrades included road / ground regrading, a few large diameter pipes, higher capacity catch basins, increased ditch capacity, and increased culvert capacity.

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

TRI-MUNICIPAL
REGIONAL PLAN

Coordinate System: CANA83-3TM114

- Tri-Municipal Plan Prime Area of Focus
- Acheson Industrial Area
- Parkland County
- City of Spruce Grove

- First Nation
- Stormwater Management Facility
- Water Body
- Water Course
- Lift Station

- Drainage Basin
- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10

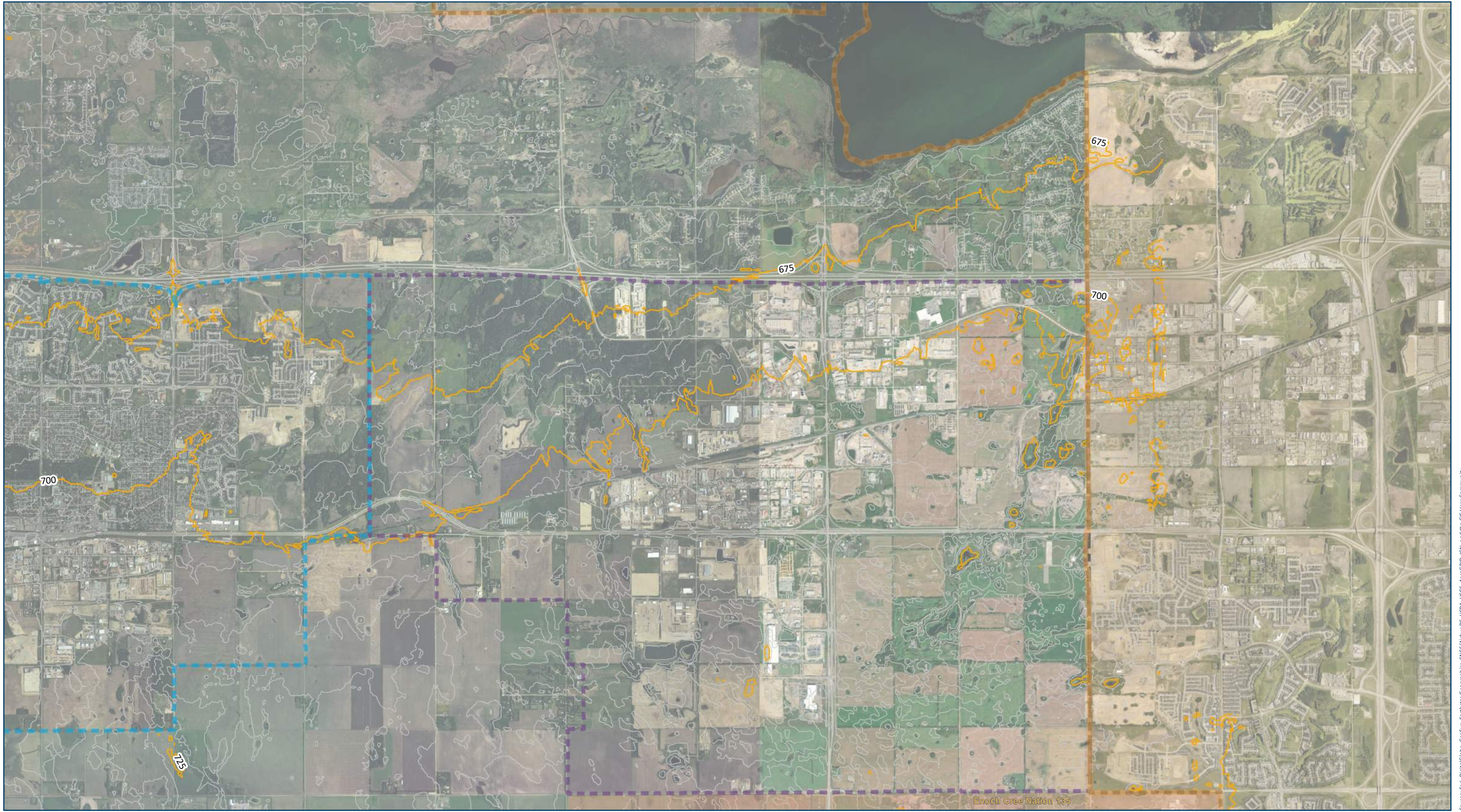
- Stormwater Main
- Unknown
 - ≤ 250 mm
 - 300 mm
 - 350 - 375 mm
 - 450 - 525 mm
 - 600 mm
 - 675 - 750 mm
 - 900 - 1200 mm
 - 1500 mm

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 4.7

ACHESON/BIG LAKE
STORMWATER NETWORK

Date: 2021-03-26 Document: \\edms3\GIS\15739_Trans_Uilities_and_Infra_Strategy\02_CADD\25_GIS\251_Figures\15739_Base_Template_200903.mxd



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

The Stormwater Master Plan for Stony Plain recommended the use of SWMFs to ensure release rates to the four major drainage channels were controlled to acceptable levels and for the Town to complete an environmental assessment of the Town to identify and help preserve environmentally sensitive wetland areas. There is a recommendation for the construction of 18 forebays, 54 constructed SWMFs, and the use of 29 natural areas for stormwater management.

Some of these are described below:

- ◆ Within the Heritage Creek drainage basin, there are four newly proposed SWMFs which will control runoff to pre-development rates when the western part of the basin develops. North of Highway 16A, there are existing SWMFs already which attenuate flows from the industrial area.
- ◆ Within the Whispering Waters Creek drainage basin, south of existing development, there are five newly proposed SWMFs for when this area develops. Downstream at the northern edge of the Town boundary, one other SWMF is proposed.
- ◆ Within the Stony Creek drainage basin, there is one SWMF proposed at the southern upstream end, two within Willow Park Natural Area, two SWMFs south of Stony Plain Golf Course, one SWMF within Stony Plain Golf Course, and two SWMFs at the northeast corner of undeveloped land within the Town's boundaries.
- ◆ Within the Atim Creek drainage basin, there are 12 proposed SWMFs to the south and east to control runoff when these areas develop.

As part of the Flood Mitigation Program within Stony Plain, culvert upgrades and installation of a SWMF has been recommended to reduce the risk of flooding within the Whispering Waters Creek drainage basin. This recommended option costs approximately \$2.9M. There were also recommendations for manhole sealing and local improvements throughout the town which would cost approximately \$12.9M.

4.4.3 Parkland County

Within the Acheson / Big Lake area, any development within or near wetlands such as the Wagner Natural Area will require appropriate protection and/or compensation required by the Government of Alberta. This is critical since the Acheson Industrial Area backs onto the Wagner Natural Area and will require additional considerations and focus on the environmental impacts of development. Context sensitive design may be required in this area.

For Basin 1, the 2013 ISL Drainage Basin 1 Preliminary Design report recommends the following:

- ◆ A total of 31 SWMFs spread out over three phases of development. Stage 1 was expected from 2013 – 2021 (8 years), Stage 2 from 2022 – 2038 (9 – 25 years), and Stage 3 from 2039+ (greater than 25 years out).
- ◆ The outlet rate for proposed SWMFs can be reduced to 0.6 L/s/ha without significant cost / sizing impacts.
- ◆ These proposed SWMFs are expected to be connected to a shallow gravity outfall pipe along Highway 60 which will eventually drain to Big Lake.
- ◆ Due to lower elevations in the south of Acheson, several SWMF pumping facilities will be required to pump the stormwater into the trunks draining to Big Lake.

The Basin 1 plans continue to evolve based on development pressures and subsequent design. For example, the alignment of the forcemain within Zone 7 has changed with a 1300 m has shifted north by about 600 m.

Table 4.3 summarizes plans for Basins 2 through 10.

Table 4.3: Summary of Proposed Plans for Drainage Basins 2 Through 10.

Basin	Total Drainage Area (ha)	Undeveloped Area (ha)	Proposed SWMFs	Description
2	500	289	8	One SWMF proposed in the developed Ellis Industrial Park, seven within the undeveloped area. Ponds are restricted to 2.5 L/s/ha except for the Consor SWMF which is limited to 1.2 L/s/ha to protect Morgan Creek.
3	474	474	6	All SWMFs controlled to 1.2 L/s/ha. Wetland potholes within the groundwater recharge zone must be maintained. Infiltration into groundwater is recommended as a design philosophy for this area since SWMF outlet rates are restricted.
4	432	295	13	Roadside ditches / natural drainage channels will convey flows from south of Highway 16. A 750 mm culvert crosses Highway 16 and drains through Walker Lake naturally towards Atim Creek.
5	170	77	3	All runoff is routed into the Walker Lake ditch which drains to Big Lake.
6	165	146	4	All flows conveyed by a ditch along Range Road 263 to Big Lake.
7	335	245	5	South of Highway 16 may require pumping due to a lack of grade. North of Highway 16, a defined drainage channel exists providing natural drainage to Big Lake.
8	540	517	7	North of Highway 16, there is a natural drainage channel and several existing culverts to convey flows. South of Highway 16, the drainage pathway isn't well defined.
9	45	45	1	This area drains to a ravine and then to Big Lake.
10	10	20	1	This area drains to a ravine and then to Big Lake.

Notes:

1. SWMFs within basins 4 through 10 are limited to 2.5 L/s/ha.

5.0 EXISTING TRANSPORTATION SYSTEMS

Transportation focus includes roadways (highways, arterial and collectors), active transportation networks (local, regional trails, cycling facilities), goods movements (local, provincial networks), transit facilities (park and ride, local and regional transit routes), railway (mainlines, spur lines) and bridges (interchanges, major river crossings). Transportation inputs for the Tri-Municipal Region plan include summarizing existing infrastructure and current plans which impact the development of the Tri-municipal Region Plan.

5.1 Overview of Documents Reviewed

To complete the review information regarding existing transportation infrastructure and current plans were gathered from the following sources:

- ◆ **Tri-Municipal:** Parkland County, Stony Plain, Spruce Grove.
- ◆ **External:** Alberta Transportation (AT), Edmonton Metropolitan Region Board (EMRB), Edmonton Region Transit Commission (RTSC), Canadian National (CN) Rail, Edmonton Transit Service (ETS).

Documents reviewed are shown in the following table.

Table 5.1: Documents Reviewed

Index	Document Title	Document Date	Municipality
4	Active Transportation Strategy	1/28/2020	Stony Plain
47	City Centre ARP	4/16/2018	Spruce Grove
65	Corporate Plan	12/1/2019	Stony Plain
66	Corporate Plan	1/1/2020	Spruce Grove
89	Downtown Redevelopment Plan	1/1/2011	Stony Plain
102	EMRB Regional Growth Plan	10/26/2017	External
103	EMRB Transit Services Commission Plan	1/22/2020	External
107	Environmental Strategy/Action Plan	1/1/2011	Stony Plain
108	Environmental Strategy/Action Plan	2/1/2011	Spruce Grove
110	Environmental Conservation Master Plan	6/18/2014	Parkland County
123	Financial Indicator Graphs	12/31/2018	Stony Plain
124	Financial Indicator Graphs	12/31/2018	Spruce Grove
125	Financial Indicator Graphs	12/31/2018	Parkland County
158	ICC Transit Presentation	1/1/2020	Tri-Muni
189	Long-Term Strategic Plan	unknown	Parkland County
197	Memorandum of Agreement - Tri-Region Transit	8/1/2019	Tri-Muni
199	Metropolitan Region Servicing Plan Report (MRSP)	1/1/2019	External
204	Municipal Development Plan	10/1/2017	Parkland County

Index	Document Title	Document Date	Municipality
206	Municipal Development Plan	5/9/2016	Spruce Grove
209	Municipal Development Plan	4/1/2020	Stony Plain
226	Off Site Levy Bylaw	7/1/2015	Parkland County
230	Old Town Community Plan	6/10/2019	Stony Plain
335	Strategic Plan	1/1/2018	Spruce Grove
348	Technical Growth Study	10/1/2017	Parkland County
350	Technical Growth Study	6/1/2019	Spruce Grove
358	Traffic Impact Assessment (Acheson/Big Lakes)	9/19/2018	Parkland County
359	Traffic Safety Plan	1/1/2019	Spruce Grove
360	Transit Annual Report	11/18/2019	Spruce Grove
361	Transit Bus Service Agreement	1/1/2018	External
362	Transit Cost and Revenue Sharing Agreement	1/14/2020	Tri-Muni
363	Transit Plan	2/1/2018	Tri-Muni
364	Transit Report	1/1/2018	Tri-Muni
365	Transit Survey	8/16/2018	Spruce Grove
368	Transit Survey	11/20/2018	Spruce Grove
369	Transportation Master Plan	5/1/2012	Spruce Grove
370	Transportation Study	8/1/2011	Stony Plain
371	Transportation Master Plan	11/30/2020	Parkland County
374	Understanding Municipal Realities	10/4/2019	Spruce Grove
375	Understanding Municipal Realities	10/4/2019	Stony Plain
376	Understanding Municipal Realities	10/4/2019	Parkland County
426	Municipal Development Plan	2/24/2020	Spruce Grove
428	Accessible Transportation Plan	1/1/2019	Stony Plain
459	Boundary Interface Planning Study	7/1/2007	Tri-Muni
	Municipal Development Standards	5/1/2020	Stony Plain
	Municipal Development Standards	1/1/2015	Spruce Grove
	Capital Infrastructure Program 2020 - 2023	4/1/2020	Parkland
	2015 Household Travel Survey	4/1/2018	City of Edmonton
	Engineering Design Standards	3/1/2015	Parkland
	Parkland County Strategic Overview and Presentation	1/1/2018	Parkland County
	IRTMP Environmental Scan	5/14/2020	EMRB
	2018 Priority Regional Transportation Projects	2018	EMRB
	Traffic Bylaw	Unknown	Stony Plain

Index	Document Title	Document Date	Municipality
	Roadside Management Classification Map	9/2019	Alberta Transportation
	Access Management Guidelines	2005	Alberta Transportation
	Highway 628 Functional Planning Study	1/2008	Alberta Transportation
	Transit Service Commission Addendum	06/1/2020	EMRB
	Edmonton Transit Routes (560,561,562)	N/A	City of Edmonton
	Transportation Master Plan	1/3/2021	Stony Plain

5.2 Governance

Transportation networks have varying governing authority and these are summarized as follows.

- ◆ **Parkland County** – All public roadways within the County are owned by Alberta Transportation.
- ◆ **City of Spruce Grove** – All public roadways within the City, including Highway 16A (within the City's borders) are owned by the City.
- ◆ **Town of Stony Plain** – All public roadways within the Town are owned by the Town, except for Highway 628, Highway 779 and Highway 16A, which are owned by Alberta Transportation
- ◆ **Alberta Transportation** – Alberta Transportation owns all provincial roadways within the study area, except Highway 16A within the boundary of the City of Spruce Grove.
- ◆ **Edmonton Metropolitan Regional Board (EMRB)** – EMRB administers the Integrated Regional Transportation Master Plan (IRTMP) which includes planning transportation systems for roads, transit, air, rail and active transportation within the Edmonton region. The 2011 IRTMP is being updated based on the 2017 EMRB growth plan and is expected to be complete in early 2021. With the IRTMP, member municipalities collaborate annually, setting priorities for regionally significant transportation projects. Parkland County, City of Spruce Grove and Town of Stony Plain are EMRB member municipalities and are actively involved with the IRTMP update and transportation priorities.
- ◆ **CN Rail** – An east/west rail line exists across the study area, owned and operated by Canadian National, adhering to Transport Canada standards which outline the types of crossing controls needed at intersections with roadways.
- ◆ **Regional Transit Service Commission (RTSC)** – Started in 2017, the RTSC is dedicated to developing and expanding inter-municipal transit within the Edmonton Metropolitan Area. The commission is still early in its development and planning stages. Stony Plain and Spruce Grove are members of the RTSC.
- ◆ **Aerodrome** – Parkland County offers an aerodrome which is owned by Parkland Airport Development Corporation and federally governed by Transport Canada. It is located on Range Road 270, ~2km north of Highway 627.

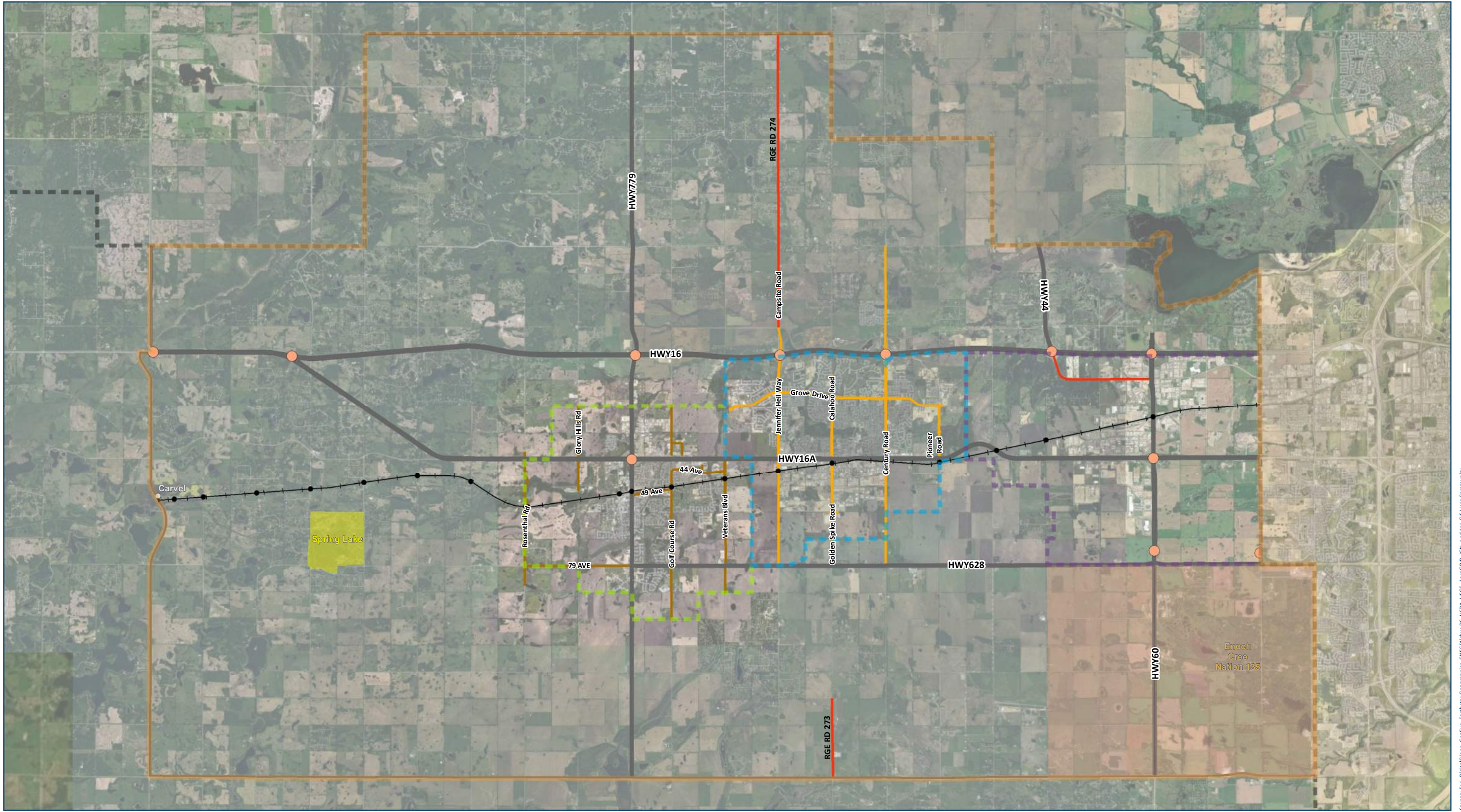
5.3 Existing Transportation Infrastructure

5.3.1 Existing Roadways

Existing roadways includes provincial highways classified as freeways, expressways or multi-lane highways, listed in order of providing higher levels of mobility and higher access regulations. Higher level highways have access limited to interchanges and these are included in the existing roadway inventory. Existing roadways also include arterials within Spruce Grove, Stony Plain and Parkland County and their crossing of CN rail is included in the inventory. The following described each of the roadways in the study area, with reference to **Figure 5.1**.

Provincial Highways

- ◆ **Highway 16:** A four lane divided freeway serving as the northern border of Spruce Grove, providing direct access to Acheson and the City of Edmonton to the east. The roadway is owned and operated by Alberta Transportation. The weekday average annual daily traffic volume on Highway 16 is 49,540 at the eastern project limit, 43,530 east of Spruce Grove, and 28,910 at the western project limit based on Alberta Transportation's 2019 data. AT classifies Highway 16 as a freeway with access limited to interchange roadways, where there is one interchange providing access to the Town of Stony Plain and two interchanges for Spruce Grove access. North of Highway 16, Parkland County has a collector road that parallels the highway which directs traffic to the interchanges.
- ◆ **Highway 16A:** A four and six lane divided roadway (through Spruce Grove) classified by AT as a Multi-Lane Highway. AT specifies the corridor is as an urban undivided expressway between the Edmonton boundary and 800 m west of Highway 779, and as a rural divided arterial for the remaining portion to the west. The corridor bisects Spruce Grove in the south, providing direct access to Acheson and the City of Edmonton to the east. Highway 16A serves as a primary access to Stony Plain, separating the industrial areas to the north from the remainder of the town. The highway continues west, merging with Highway 16 west of Range Road 20 and includes a grade separated rail crossing east of Township Road 530B. The Acheson Industrial Park is divided into a north and south section by this highway. The roadway is owned and operated by Alberta Transportation, except for the portion within the Spruce Grove boundary. Within Spruce Grove, the highway is operated by the City and includes several accesses to adjacent businesses. The weekday average annual daily traffic volume on Highway 16A is 26,790 at the eastern project limit, 23,040 west of Spruce Grove and east of Stony Plain, and 8,110 east of the Highway 16 interchange based on Alberta Transportation's 2019 data. AT classifies Highway 16A as a multi-lane highway, with access limited to public roadway connections (no direct development access permitted).
- ◆ **Highway 628:** Located 3.2 kilometers south of Highway 16A, it is currently a two-lane arterial roadway that becomes Whitemud Drive within the Edmonton City limits, and Township Road 524 west of Highway 779 (48 Street). This two-lane road is paved from Highway 779 eastward for approximately 6.1 kilometers and transitions to a gravel surface in poor condition at Golden Spike Road continuing eastward to the Highway 60 intersection. Between Highway 60 and the City of Edmonton it is paved and in very poor condition.



The Highway provides access into Spruce Grove via Century Road, Golden Spike Road, and Campsite Road. Highway 628 also provides access to several Stony Plain neighbourhoods as well as the rest of the Town via Highway 779. The roadway is owned and operated by Alberta Transportation. The weekday average annual daily traffic volume on Highway 628 is 4670 between Highway 779 and Highway 60. AT classifies Highway 628 as a Multi-Lane Highway, specifically a rural divided arterial except within Stony Plain's boundary south of Highway 16A, which is classified as an urban divided arterial. No direct development access is permitted.

- ◆ **Highway 627:** Located on the south boundary of the plan area, the roadway is a paved two-lane highway 9.6 km south of Highway 16A. The roadway has a controlled intersection with Highway 60 and provides direct access to the Anthony Henday Drive via Maskekosihk Trail. AT classifies Highway 627 as a multi-lane Highway (rural undivided arterial) east of Highway 779 and a major highway (rural undivided arterial) to the west. No direct development access is permitted.
- ◆ **Highway 633:** Highway 633 on the extreme north boundary of the plan area 9.7 kilometers north of Highway 16, is a two-lane highway which provides east west connectivity from Highway 43 to Highway 2, just north of St. Albert. AT classifies Highway 633 as a major highway, specifically a rural undivided arterial with interrupted flow and access to freeways, expressways, arterials, and collectors. No direct development access is permitted east of Highway 633.
- ◆ **Highway 60:** Highway 60 is a paved four lane highway which starts at Highway 16 and provides a crossing of the North Saskatchewan River and connectivity to Highway 19 (to Nisku) and Highway 39 (to Drayton Valley, Leduc) and ultimately, Highway 2 to Calgary. It is a north/south highway bisecting Acheson with several intersection roadways and accesses to adjacent development. The roadway exists as 2 lanes north of Acheson Road and four lanes to the south. The highway is owned and operated by Alberta Transportation. A two-track at-grade CN railway crossing with an active warning system consisting of flashing bells and gates crosses Highway 60, between Highway 16 and Highway 16A. An average of 27.86 crossings occur daily based on the Government of Canada Grade Crossings Inventory, accessed on August 9, 2020. Funding was announced in 2019 to twin the roadway between Highway 16 and Highway 16A and to build an overpass to cross the busy CN mainline and twin Highway 60, north of Acheson Road. The weekday average annual daily traffic volume on Highway 60 is 12560 between Highway 16 and Highway 16A. AT classifies the roadway as a multi-lane highway, specifically an urban divided expressway with uninterrupted flow and access to freeways, expressways, and arterials. Highway 60 is classified as a rural divided arterial south of Highway 627. No direct development access is permitted, although through Acheson several private accesses to adjacent development exist.
- ◆ **Highway 44:** Existing as a two lane roadway, connecting at an interchange with Highway 16. Functions as a north/south route, paralleling Highway 2, from the City of Edmonton and joining with Highway 2 near the hamlet of Hondo, extending further north into the province of Alberta. South of Highway 16, Highway 44 terminates, connecting into the Acheson. AT classifies Highway 44 as a multi lane highway, specifically a rural divided arterial with uninterrupted flow and access to freeways, arterials, collectors, and local roadways. No direct development access is permitted.

- ◆ **Highway 779:** Existing as a two lane roadway, Highway 779 is a north/south highway that bisects Stony Plain. At the busiest point, weekday average annual daily traffic volume on Highway 779 is 16340 between Highway 16A and Highway 628. Highway 779 has several different AT classifications within the plan area. Highway 779 has several different AT classifications within the plan area. AT's Roadside Management Classification Map classifies the majority of Highway 779 as a rural undivided arterial (major highway) which permits direct access, however it is classified as a rural divided arterial between Highway 16 and Highway 16A, and an urban divided arterial from Highway 16A to the southern Stony Plain boundary, both of which are classified as multi-lane highways which do not permit direct access. However, it is noted development exist along the corridor. The existing CN rail crossing is a cause of major concern for residents in Stony Plain as Highway 779 functions as a major corridor moving traffic.
- ◆ **Highway 43:** A four lane north/south roadway branching off Highway 16 serving as a portion of the western study area boundary. Highway 43 is a key corridor providing access to northern Canada. The roadway has a weekday average annual daily traffic volume of 13190 between Highway 16 and Highway 633. AT's Roadside Management Classification Map classifies Highway 43 as a rural divided freeway with uninterrupted flow and access to freeways, arterials, and collectors. No direct development access is permitted.
- ◆ **Highway 770:** A four lane north/south roadway branching off Highway 16 serving as a portion of the western study area boundary. The roadway has a weekday average annual daily traffic volume of 2920 between Highway 16 and Highway 627. AT's Roadside Management Classification Map classifies Highway 770 as a major highway, specifically a rural undivided arterial with access to freeways, arterials, collectors, local roadways, and driveways.

Arterials

- ◆ **Campsite Road (Parkland County):** Two lane rural paved north/south roadway that connects to a Highway 16 interchange and Jennifer Heil Way (City of Spruce Grove). Designated as an arterial in Parkland County's Municipal Development plan.
- ◆ **Golden Spike Road (Parkland County):** Two lane rural paved north/south roadway that extends from Golden Spike Road (city of Spruce Grove) as Range Road 273 in the county. Connects to Highway 628 and Highway 627 with at-grade intersections. Designated as an arterial in Parkland County's Municipal Development plan.
- ◆ **Jennifer Heil Way/Campsite Road (Spruce Grove):** North/south roadway, exists as a four lane roadway urban arterial between Highway 16 and Highway 16A, with interchange access at Highway 16, accommodating 13,000 to 17,000 vehicles per day, based on the 2012 Transportation Master Plan. South of Highway 16A, accommodates 4,000 to 6,000 vehicles per day and outside of the City boundary connects to Highway 628 and 627 with at-grade intersections. Crosses the CN rail line south of Highway 16A.
- ◆ **Calahoo Road/Golden Spike Road (Spruce Grove):** North/south roadway, bisecting the City of Spruce Grove as a four-lane urban arterial, between Diamond Avenue and residential neighbourhoods south of Highway 16. Accommodates 5,000 to 10,000 vehicles per day, with less than 5,000 vehicles per day as the roadway connects into residential areas in the north, based on the 2012 Transportation Master Plan.

South of the City boundary connects to Parkland County arterial Range Road 273. Crosses the CN rail line 110 m south of Highway 16A and the small spacing can cause traffic to queue back to Highway 16A as trains cross.

- ◆ **Century Road (Spruce Grove):** North/south roadway, exists as a four-lane urban arterial between Highway 16 and Highway 16A, with interchange access at Highway 16, accommodating approximately 12,000 vehicles per day based on the 2012 Transportation Master Plan. South of Highway 16A, exists as a two-lane rural arterial accommodate 6,000 vehicles per day. South of the City boundary connects to Parkland County Range Road 272. Crosses the CN rail line 80 m south of Highway 16A and the small spacing can cause traffic to queue back to Highway 16A as trains cross.
- ◆ **Grove Drive (Spruce Grove):** East/west roadway within the north portion of Spruce Grove, exists as a four-lane arterial roadway, except near the east and west limits where it is two lanes. Accommodates 3,000 to 10,000 vehicles per day with the highest volumes occurring near the central point at Calahoo Road.
- ◆ **Diamond Avenue (Spruce Grove):** East/west two-lane rural roadway, connecting between Campsite Road and Century Road serving access to industrial development located south of Highway 16A.
- ◆ **Veterans Boulevard (Stony Plain):** North/south arterial roadway on the east side of Stony Plain, connecting at Highway 16 with an at-grade intersection. North of Highway 16A, Boundary Road terminates near the natural area. The corridor exists as a two-lane rural unpaved roadway north of Highway 16A, then transitions to a four lane paved divided roadway between Highway 16A and Fairway Drive, transitioning south to a two lane paved roadway. South of Highway 16A, Veterans Boulevard provides access to development and connects into Parkland County as Range Road 275. The corridor crosses the CN rail line south of Highway 16A.
- ◆ **Golf Course Road (Stony Plain):** North/south urban arterial roadway, connecting north of Highway 628, extending into residential areas in northeast Stony Plain, crossing Highway 16A via South/North Park Drive becoming Range Road 230 outside of the Town's boundary. Golf Course Road exists as a paved four lane undivided roadway from Fairway Drive/Brightbank Avenue to south of Highway 16A and a paved two-lane roadway for the remaining portions within the bounds of the Town. The corridor connects at Highway 628 with an at-grade intersection, extending to the south as Range Road 280, paralleling Highway 779.
- ◆ **Range Road 12 (Stony Plain):** North/south two-lane rural roadway, connecting north of Highway 16 and south to Highway 627 and beyond. Accommodates low traffic volumes, connecting at Highway 16, Highway 628 and Highway 627 with a at-grade intersections. The roadway also includes a rail crossing between Highway 16A and Township Road 524. Noted as an arterial in the 2011 Transportation Study, but not currently providing arterial level function.

Existing Roadway Classification System

The roadway classifications systems for the road authorities within the Study area is discussed in the following sections.

ALBERTA TRANSPORTATION

Alberta Transportation's roadway classification system is outlined in the provinces access management guidelines. For access to the highway from a proposed development, access management controls are based on the highway classification designated by Alberta Transportation (AT). There are four main highway classification, including:

- ◆ **Freeway/Expressway:** Freeways are the highest roadway category in the provincial roadway network and are differentiated from expressways in that freeways allow access only via interchanges. Traffic traveling in opposite directions is separated by a median. No at-grade intersections or direct accesses are allowed. Expressways are also multi-lane highways that may evolve into freeways.
- ◆ **Multi-lane Highways:** For purposes of access management, multi-lane highways have restrictive requirements, albeit less than the freeway/expressway category of roadway. In some cases, a highway may exist as a two-lane road and planned to be upgraded to a multi-lane highway. Through conversion of the roadway to a multi-lane highway, access requirement change and removal of non-conforming accesses may occur.
- ◆ **Major Two-Lane Highway:** Major two-lane highways comprise a significant portion of the roadway network in the province. For a major two-lane facility, the access management strategy along the route is progressively less restrictive when compared to the preceding roadway types. Confirmation of access configuration and location is subject to a Traffic Impact Assessment confirming the access will not adversely affect the main road.
- ◆ **Minor Two-Lane Highway:** Minor two-lane highways distribute traffic between major highway facilities and important market areas serving agricultural, commercial, industrial and recreational needs. Access is not permitted within 400 m of a public intersection, although there have been many exceptions to this rule in built up areas.

The roadway classifications are described in the following table.

Table 5.2: Alberta Transportation Classifications

Highway classification	Traffic volume	Access	Intersection Spacing
Freeways/Expressways	Typically, more than 10,000 vehicles per day	Limited to interchange locations	1,600 – 3,200 m
Multi-lane divided highways	Typically, more than 10,000 vehicles per day	Generally limited to intersections with arterial and collector roads	1,600 m
Major two-lane highways	Typically, more than 1,000 vehicles per day	Generally located at intersections with collector roads	400 m
Minor two-lane highways	Typically, less than 1,000 vehicles per day	Should be limited to one access per quarter section	200 m

Highway classifications are extracted from the provincial highway classification map in **Figure 5.2**. AT goes into further detail with the roadway functional classification. The functional classifications are a combination of three components, correlating to a three letter classification:

- ◆ The surrounding context, either Rural (R) or Urban (U).
- ◆ The function of the roadway in terms of its emphasis on mobility versus access, either Freeway (F), Expressway (E), Arterial (A), Collector (C), or Local (L).
- ◆ The presence of a physical barrier between the opposing streams, either Divided (D) or Undivided (U).



Figure 5.2: Roadside Management Classification Map (Source: Alberta Transportation 2020)

The Highways Development and Protection Act and its regulations govern access management to highways that are under provincial jurisdiction. A roadside development permit application must be submitted to the provincial government for any development that falls within 800 m of an intersection and 300 m from the edge of the highway right of way as shown in **Figure 5.3** below.

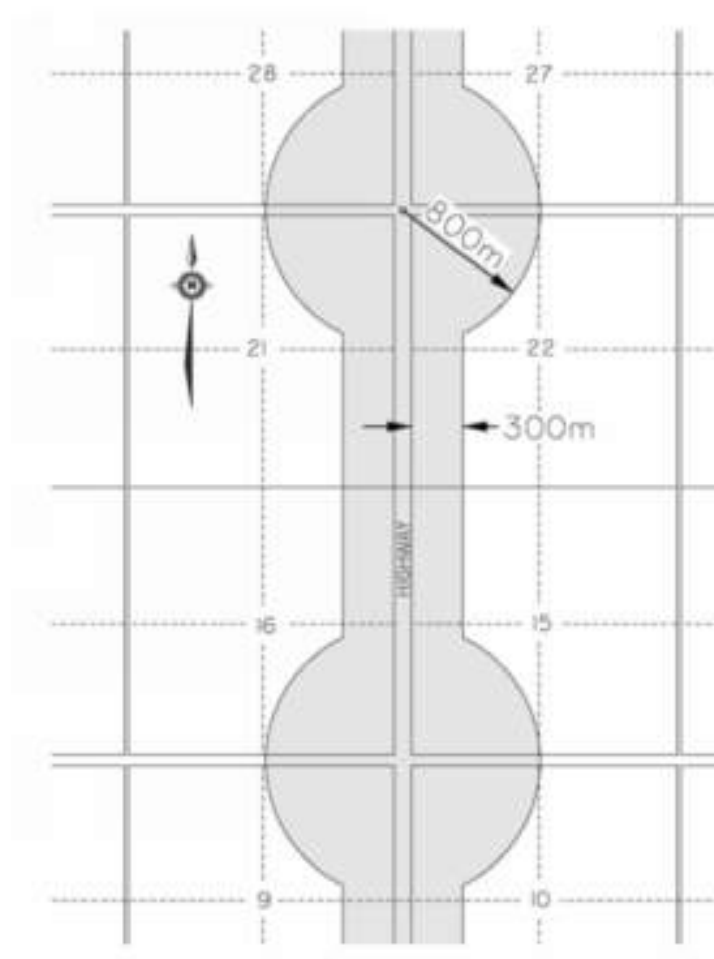


Figure 5.3: Permitting Authority Area (Source: Alberta Transportation)

PARKLAND COUNTY

Parkland County roadway classification system is outlined in their Engineering Design Standards. The roadway classification system is described as follows:

- ◆ **Arterial:** A high capacity roadway designed to connect traffic to collectors, freeways, and expressways. Arterials often have limited access to facilitate efficient traffic flow.
- ◆ **Collector:** Low to moderate capacity roadway designed to collect local traffic to arterial roadways. Collector roadways are typically broken down into two categories based on traffic volumes, Minor or Major, with Major Collectors serving the highest traffic volumes.

Parkland County's Roadway Classifications and design criteria are summarized below.

Table 5.3: Parkland County Access Management Requirements

Classification	Design Speed	Right-of-Way Width	Connection Characteristics	Intersection Spacing
Arterial	80 to 90 km/h	40 m	A 2-4 lane roadway and daily traffic volumes exceeding 8,000.	<ul style="list-style-type: none"> ◆ Rural: min. 400 m access/intersection spacing ◆ Industrial: min. 200 m access/intersection spacing ◆ Access restricted to intersections
Major Collector	70 to 90 km/h	30 m	A 2-4 lane roadway and daily traffic volumes between 3,000 and 9,000.	<ul style="list-style-type: none"> ◆ Rural: min. 200 m access/intersection spacing ◆ Industrial: min. 100 m access/intersection spacing ◆ Direct access to abutting properties
Minor Collector	60 to 90 km/h	30 m	A 2 lane roadway and daily traffic volumes between 1,000 and 4,000.	<ul style="list-style-type: none"> ◆ Rural: min. 200 m access/intersection spacing ◆ Industrial: min. 60 m access/intersection spacing ◆ Direct access to abutting properties

SPRUCE GROVE

The City of Spruce Grove's roadway classification system is outlined in their Municipal Engineering Design Standards and is in accordance with the Transportation Association of Canada (TAC) Geometric Design Standards for Canadian Roads and Streets. Roadways are classified described in the table below.

Table 5.4: Spruce Grove Roadway Classifications and Design Standards

Classification	TAC Standard Drawing NO.	Right-of-Way Width (m)	Design Speed (km/h)
Minor Collector – Residential	CS-02	20.0	50
Major Collector – Residential	CS-02	24.0	50
Rural Industrial Collector	CS-03	30.0	50
Urban Industrial/ Commercial Collector	CS-03	24.0	50
Four lane Divided Arterial	CS-04	54.0	60

Access management requirements are not provided for Spruce Grove roadways.

STONY PLAIN

Stony Plain's road classification system is outlined in their draft 2020 Municipal Design Standards. The roadway classifications are described as follows:

- ◆ **Arterial:** Intended for cross-town travel, connecting with collectors, other arterials, and freeways.
- ◆ **Collector:** Intended to collect traffic from local streets or industrial areas and convey it to the arterial system.

The Geometric Guidelines for Stony Plain's roadways are provided in Table 4-1 of the Municipal Design Standards, and summarized below.

Table 5.5: Stony Plain Roadway Classifications and Design Standards

Classification		Average Daily Traffic Volume	Design Speed (km/h)	Posted Speed (km/h)	ROW (m)
Arterial		12,000 – 30,000	80	60 – 70	54
Urban	Residential Major Collector	2,500 – 5,000	60	50	24
	Residential Minor Collector	1,000 – 2,500	60	50	20
	Industrial/Commercial Collector	1,000 – 5,000	60	50	24
Rural	Residential Collector	1,000 – 5,000	80	70	30
	Industrial/Commercial Collector				

Access management requirements are not provided for Stony Plain roadways.

EMRB

Transportation networks in the region comprise of several regionally significant roads classified as either arterial, expressway or freeway, and are identified in the Edmonton Metropolitan Region Board's (EMRB) Integrated Regional Transportation Master Plan (IRTMP). The EMRB's IRTMP identifies regionally significant roads as linking municipalities, major destination centres, and employment centres as well as providing access to air and rail. By definition in the IRTMP, regionally significant roads are:

“Any arterial or higher order roadway that, regardless of jurisdiction, serves to connect EMRB (formally CRB) municipalities with each other and with other regions in Alberta and Canada”

The province owns and operates the majority of regionally significant roadways in the EMRB, but often works with EMRB municipalities in completing planning studies for future roadways.

The 2011 IRTMP regional roadway classifications system serves to respect the correlation between moving people and reflecting the nature and character of the surrounding land uses and development patterns. The classifications system includes arterials, freeways and expressways, briefly described as follows:

- ◆ **Arterial Roads:** Arterial roads are primarily designed to respect the context and environment within which they exist. Arterial roadways vary across the region, and setting a single regional design standard for arterials across the region is contradictory to their intention. These roads serve to carry relatively high numbers of people and goods across a single municipality or between two or more municipalities. Spacing of intersections along arterials can vary widely, but generally falls in within 250 – 400 m depending on the adjacent development. For dense and diverse land uses, a high level of multimodal accessibility is desirable, with intersections spaced more closely. Arterial roads should include elements that cater to vehicles, buses, pedestrians and bicycles.
- ◆ **Expressways:** A form of arterial road that operates at a higher speed limit (70 – 100 km/h). Intersections are further apart (800 – 1600 m) and can be at-grade or grade-separated. Expressways have lower speeds in urban environments with closer intersection spacing. Expressways cater to transit, including transit priority measures on roadways and intersections within the expressway. Expressways connect between commercial and industrial areas and handle a higher proportion of commercial vehicles.
- ◆ **Freeways:** Freeways focus on connecting people and goods over longer distances at relatively higher speeds (80 – 110 km/h) and are considered a form of rapid, uninterrupted movement with no at-grade intersections. Interchange spacing is 1600 – 3200 m depending on adjacent development patterns.

Roadway classifications are extracted from the EMRB IRTMP (2011) and shown in **Figure 5.4**.

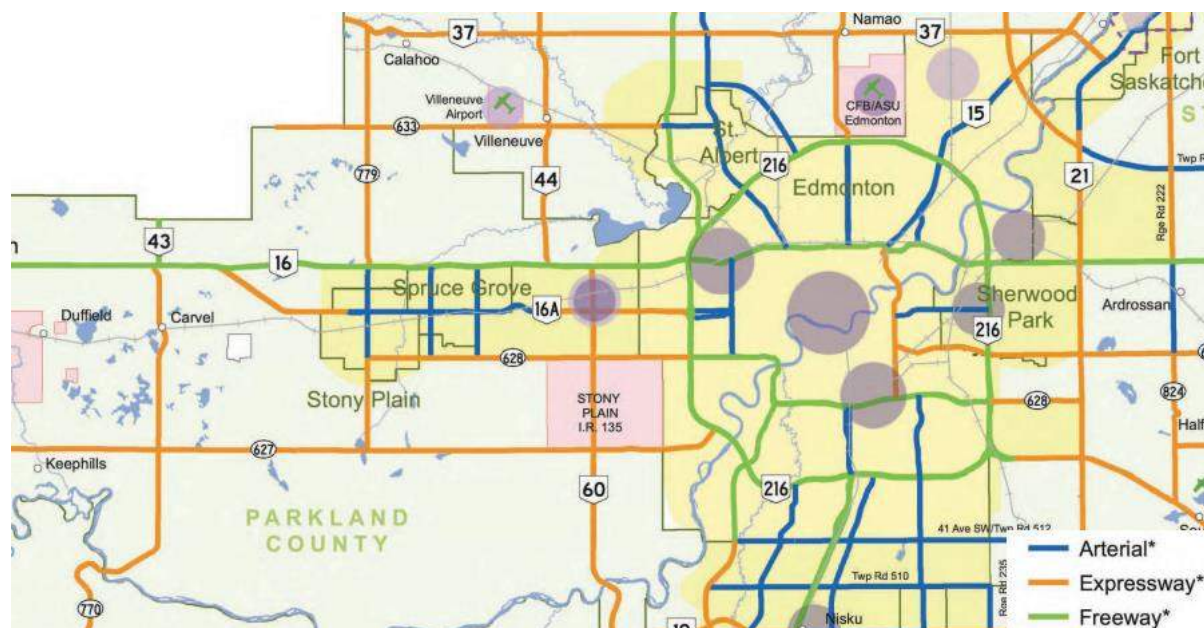


Figure 5.4: IRTMP Roadway Classifications (2011)

5.3.2 Existing Transit

Existing transit routes are shown in **Figure 5.5**.

TRI-MUNICIPAL TRANSIT

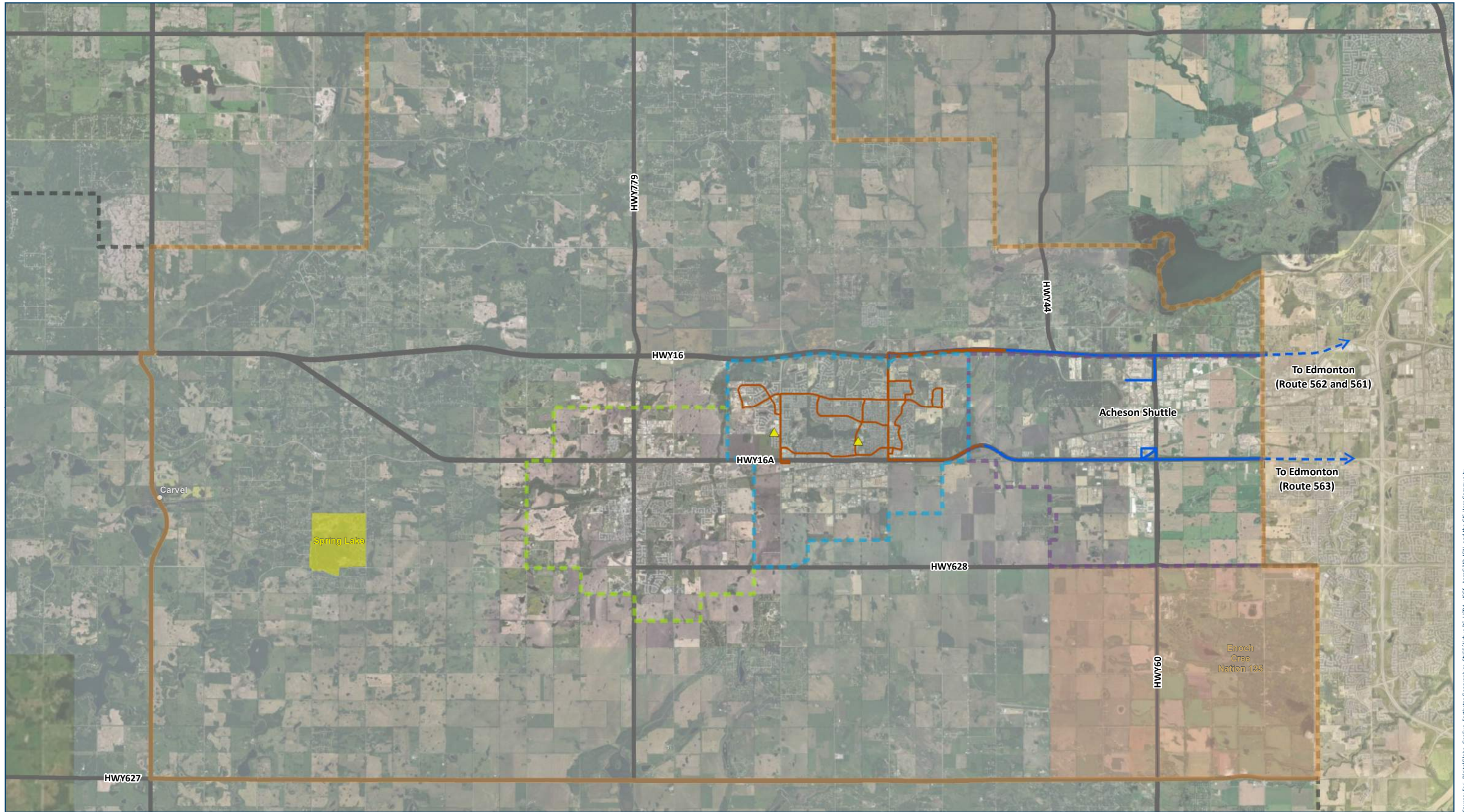
A Tri-Municipal Regional Transit Plan had been adopted between Parkland County, Town of Stony Plain, and City of Spruce Grove. Currently, conventional transit is provided by the Edmonton Transit System (ETS) and funded by the City of Spruce Grove and Parkland County to provide weekday service between Spruce Grove, Acheson, and the City of Edmonton. There are three intermunicipal transit routes, which connect NAIT, West Edmonton Mall, downtown Edmonton, and South Campus. The City of Spruce Grove has one official lot for park and ride located at the Agrena. A secondary unofficial site is located at the Tri-Leisure Centre. Local transit routes connect riders to intermunicipal transit. The intermunicipal transit routes are currently under contract through Edmonton Transit System (ETS) with a tri-municipal agreement among ETS, the City of Spruce Grove, and Parkland County for service into Acheson Industrial Park.

ETS routes 560 travels between Spruce Grove and Edmonton, route 561 travels between Acheson and Edmonton and route 562 travels between Spruce Grove and Edmonton with a stop in Acheson. There is a cost sharing agreement in place between the City of Edmonton, Spruce Grove and Parkland County for the aforementioned routes 560, 561 and 562.

ACHESON SHUTTLE

Within Acheson, Parkland County has funded a shuttle service to travel within the six zones of the employment area, connecting between ETS transit stops on Route 561 and 562. Passengers getting off ETS can board the shuttle and let the driver know where they need to go with the six zones. In the evening (for pickup) passengers need to pre-book the service.

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

5.3.3 Existing Active Transportation

Active transportation (trails and sidewalks) are provided in the Spruce Grove and Stony Plain. These are shown on **Figure 5.6**. There are currently no regional active transportation systems connecting between Stony Plain and Spruce Grove or Parkland County.

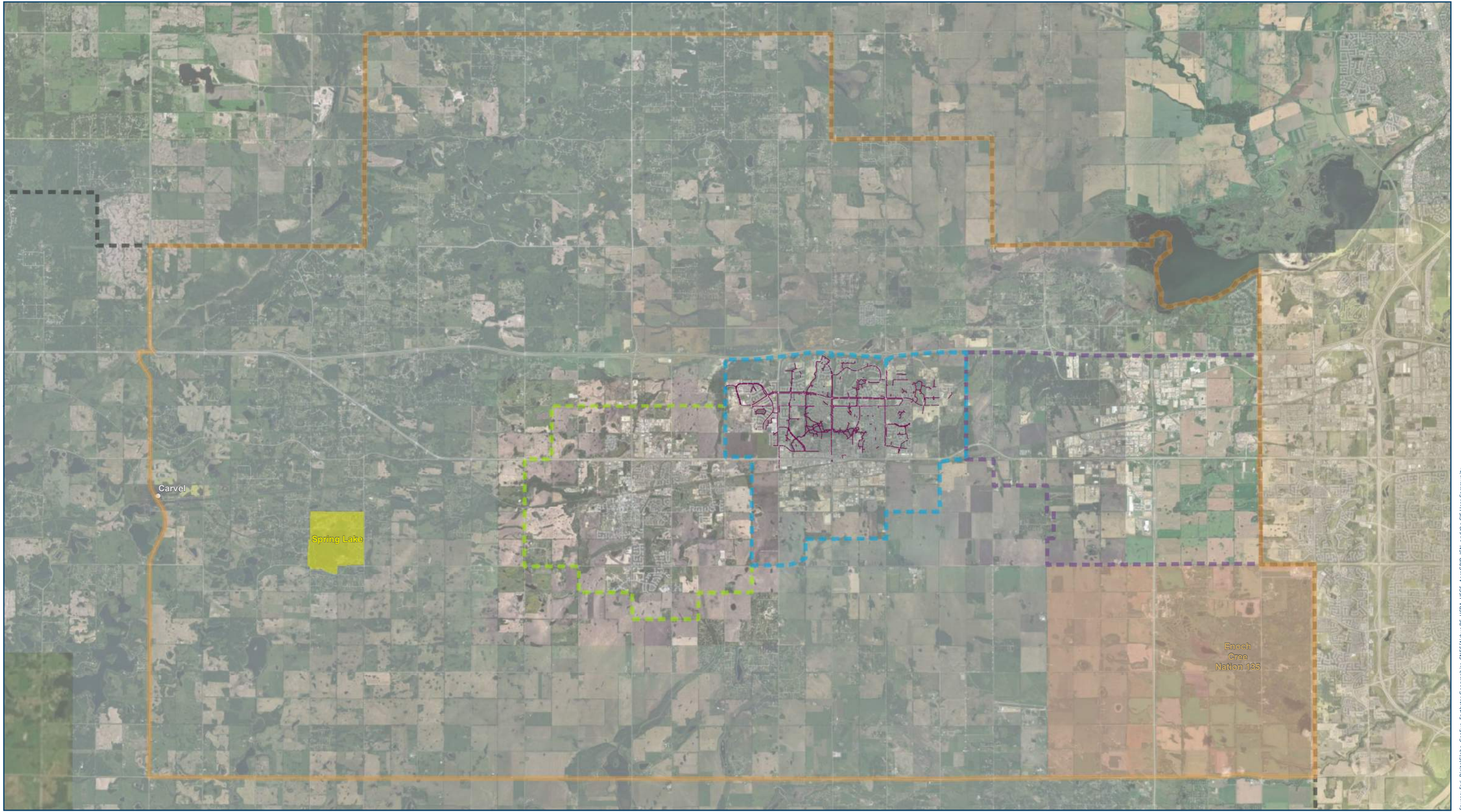
5.3.4 Existing Goods Movement

The Tri-Municipal area includes a number of areas with significant industrial and commercial development that depend on the transport of raw materials and or finished products to internal and external markets. Significant regional demands for goods movement exists within major industrial employment areas including Alberta's Industrial Heartland (Strathcona County and Sturgeon County), Nisku Industrial Park (Leduc County), Acheson Industrial Park (Parkland County), Edmonton International Airport, Strathcona County's petrochemical sites and other significant industrial and commercial sites in southeast, central, north and northwest Edmonton. Significant future areas include the Edmonton Energy and Technology Park in northeast Edmonton and Aerotropolis Developments (EIA, City of Leduc and Leduc County). Serving these major areas of economic activity with appropriate transportation infrastructure requires the provision of adequate routes for movement of heavy vehicles and adequate provision of access off these routes to allow efficient access to the industrial and commercial sites.

Goods movement includes truck routes, dangerous goods routes, long combination vehicle routes, high/heavy load corridors and rail corridors. Existing routes are illustrated in **Figure 5.7**.

ALBERTA TRANSPORTATION

Generally, all provincial highways are designated as truck routes and dangerous goods route, unless designated otherwise by a municipality. Highway 16, Highway 16 A and Highway 44 (north of Highway 16) and Highway 60 are provincial long combination vehicle routes. The provincial high load corridor does not exist through the study area. The existing high load corridor is located on Highway 39/19 and is shown in **Figure 5.8** (outside of the study area).



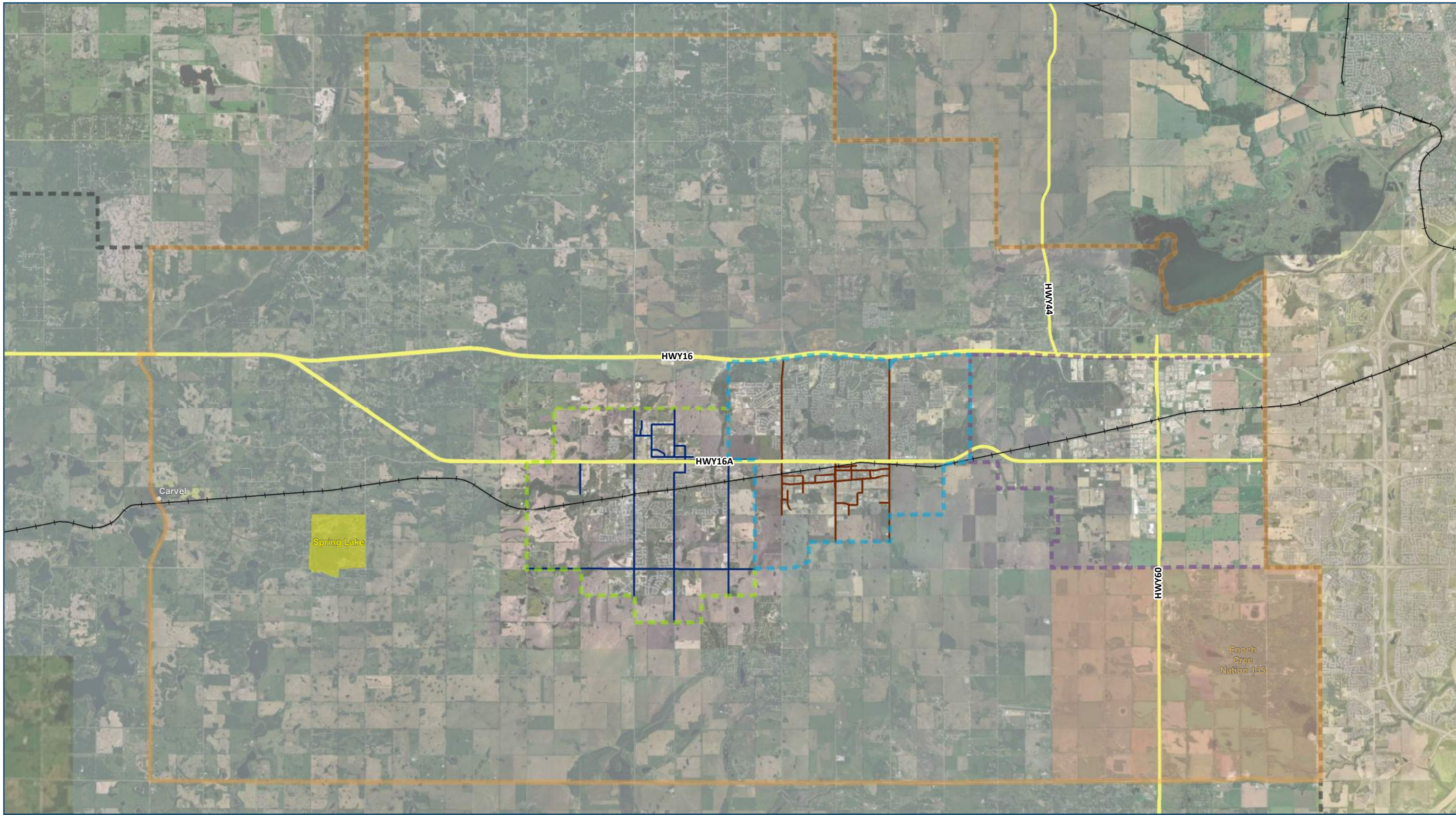




Figure 5.8: Provincial High Load Corridor (Source: Alberta Transportation 2015)

A study was completed in 2018 taking a long term, holistic approach to updating Alberta's High Load Corridor network. Highway 60, merging into Highway 44, is designated as a proposed north/south Oversize/Overweight load corridor and, will serve as a key strategic and economic corridor within the study area. The proposed Oversize/Overweight load corridor is provided in **Figure 5.9** below.

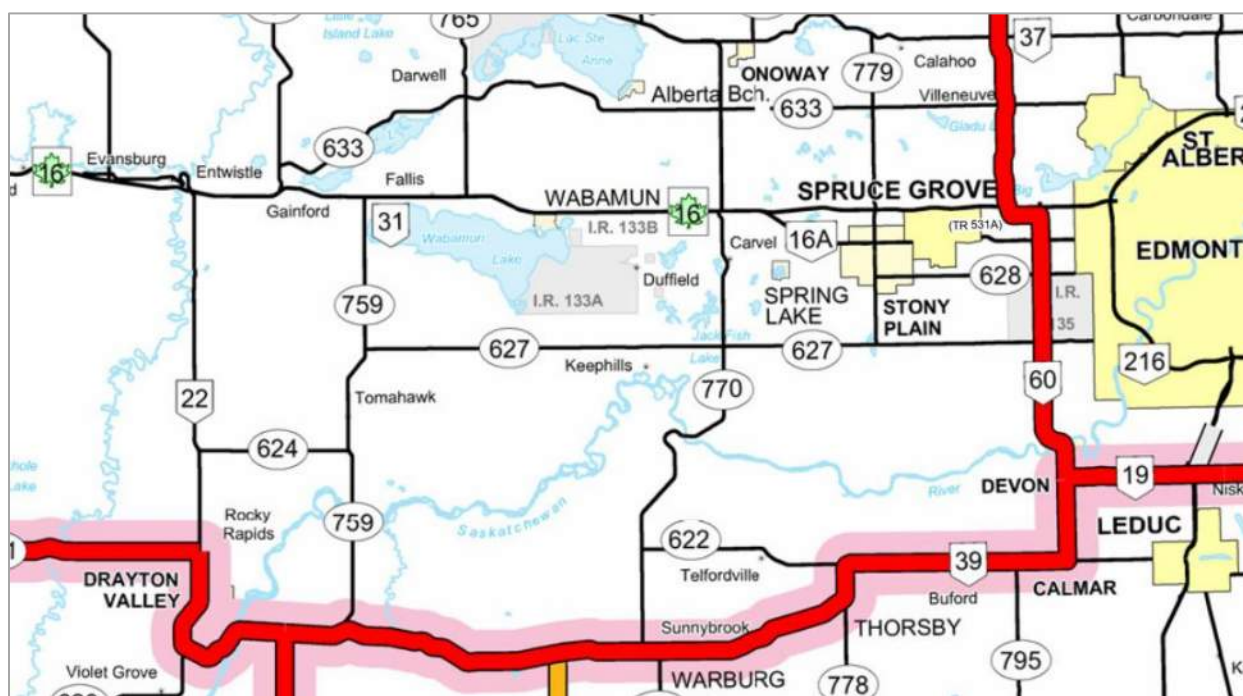


Figure 5.9: Provincial Proposed Oversized/Overweight Load Corridor (Source: Alberta Transportation 2018)

The proposed oversized/overweight load corridor from Highway 60 to Highway 44 includes 114 Avenue, through Acheson and will need improvements to support the corridor, including removal of overhead obstructions, rotatable signal/illumination arms and large turning radii, as needed.

MUNICIPAL TRUCK ROUTES

Spruce Grove and Stony Plain have designated truck routes. Highway 16A, through Spruce Grove is a dangerous goods route. Long-combination vehicle routes and/or high load corridors are not provided by the municipalities.

5.3.5 Other - Existing Regional Household Travel Survey

The City of Edmonton led a household survey in 2015 to understand travel patterns in the City of Edmonton and Edmonton Region. The survey focuses on travel data for the City of Edmonton, compared with the Region and this provides insights into the travel patterns pertaining to the study area. Some key findings:

- ◆ Vehicle ownership per household in the Region overall is higher than that of the City of Edmonton, differing by 0.65.
- ◆ The average number of trips per person and per household within the Region decreased between 1994 and 2015.
- ◆ Regional transit mode share increased from 1.8% to 2.1% (+0.3 %) between 2005 and 2015.
- ◆ The City of Edmonton's Transit Model share did not increase between 2005 and 2015.
- ◆ Transit mode share is much higher in Edmonton at 8.6% compared to the Region at 2.1%.
- ◆ School bus travel is higher in the Region at 3.8% compared to 1.2% in Edmonton.
- ◆ Walking is higher in Edmonton at 10.8% as compared to 6.4% in the Region.
- ◆ Bicycling is higher in Edmonton at 1.7% as compared to the Region at 0.8%, although it is noted that household bicycle ownership is slightly higher in the Region.
- ◆ Car passenger mode share within the Region has decreased by 0.6 %, whereas the car driver mode share has increased by 1.5 % between 2005 and 2015.

The raw data is illustrated in **Figure 5.10**.

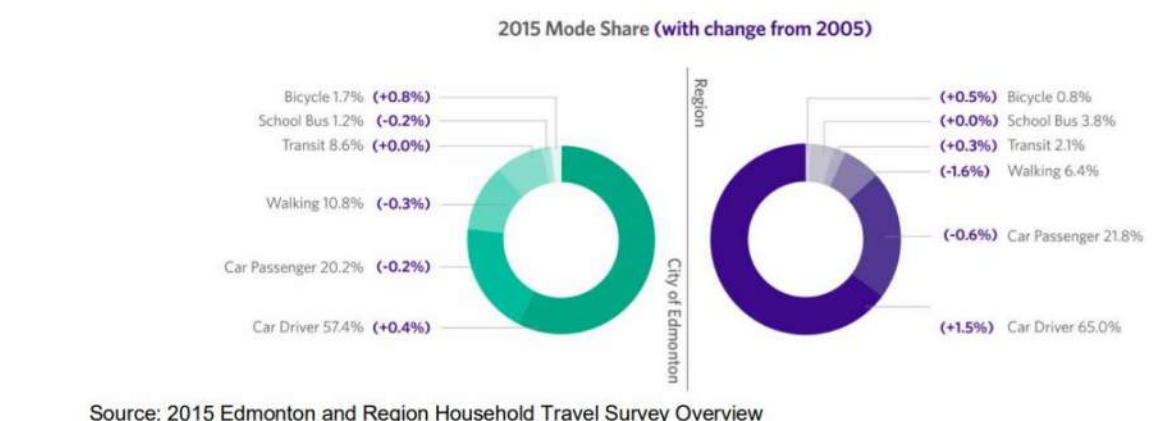


Figure 5.10: 2015 Edmonton and Region Household Survey Mode Share Comparison

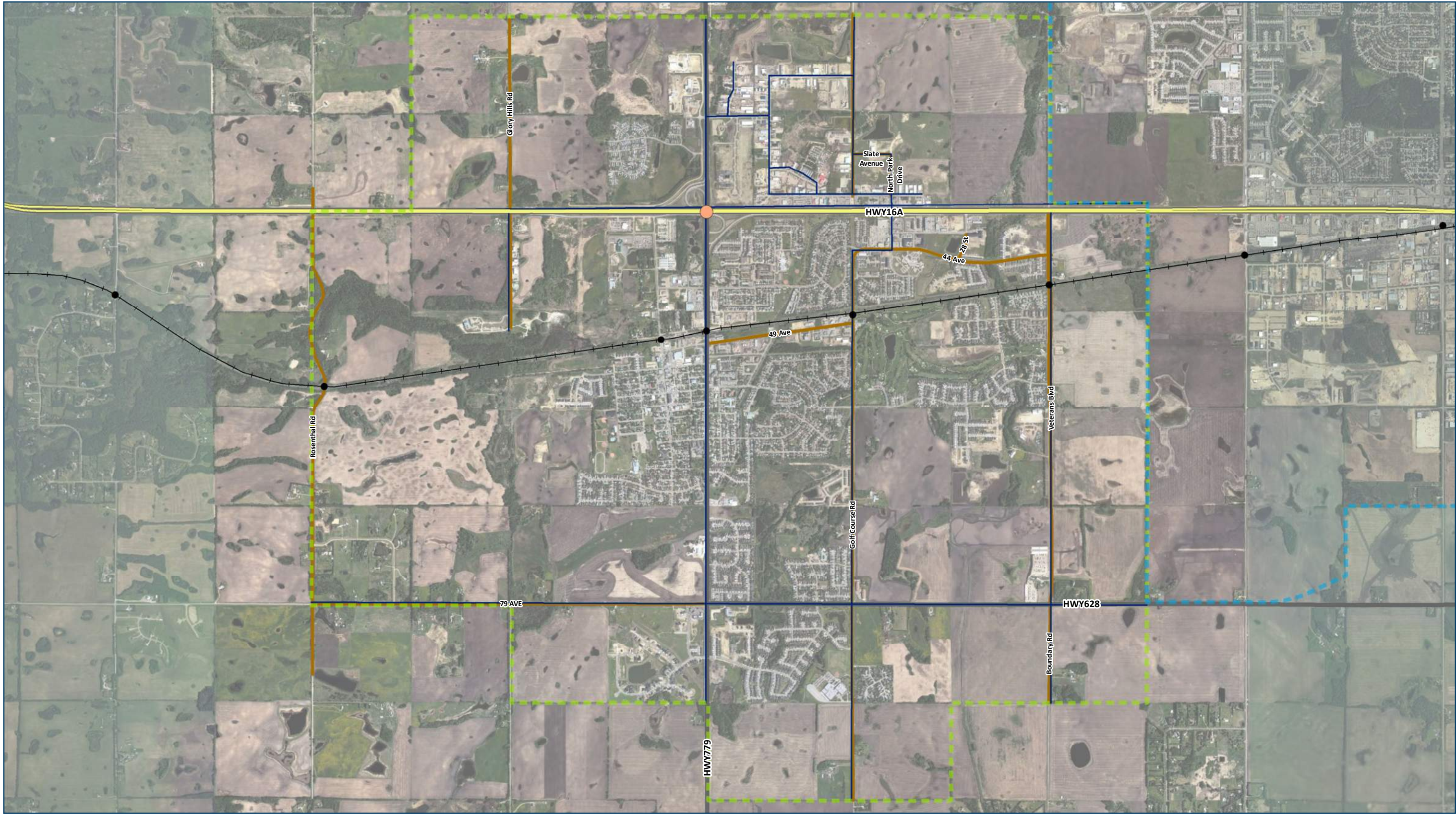
Note that the transit mode share for the region is likely skewed due a higher proportion of the regional population residing within St. Albert and Sherwood Park, which provide about 15 regional transit routes into Edmonton, with approximately 50% the distance, compare to three routes from Spruce Grove.

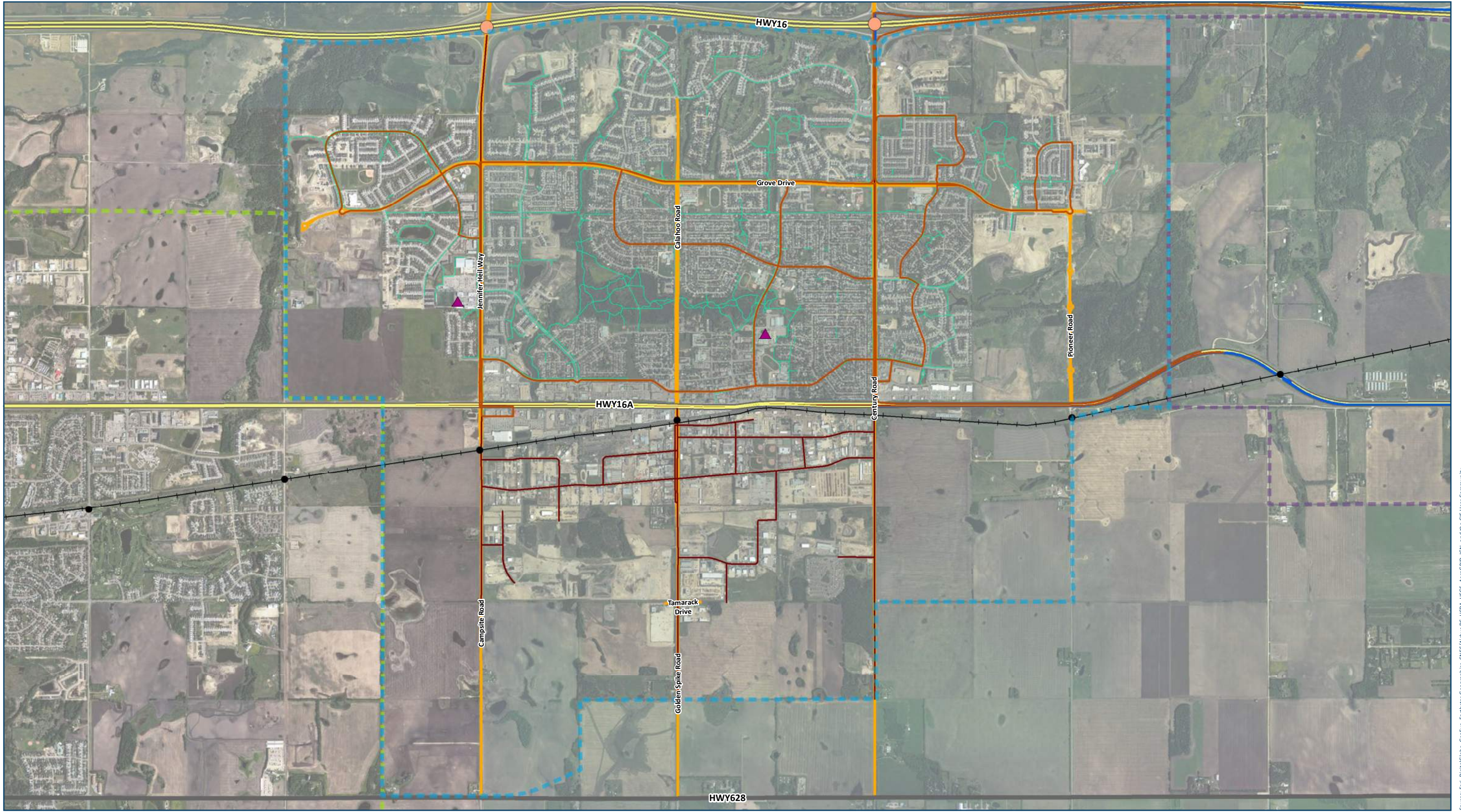
5.3.6 Preliminary Discussion of Existing Conditions

Through review of existing transportation systems the following is noted:

- ◆ Different classifications and access management requirements by the EMRB and AT for the same roadways.
- ◆ Limited access management requirements locally, other than those available from the EMRB and Alberta Transportation.
- ◆ Differing design standards between municipalities.
- ◆ The north/south portions of the study area is bi-sected by the CN rail line and there is currently only one grade separate crossing within the entire study area (Highway 16A between Atim Road and Spruce Valley Road).
- ◆ Limited transit routes (only three) and one transit shuttle (Acheson shuttle).
- ◆ Limited/no regional active transportation facilities.
- ◆ Highway 60, from Highway 16 to Highway 19: The corridor restricts load sizes moving in and out of Acheson. Upgrading this roadway to permit over-dimensional loads would complete a major trade corridor.
- ◆ Highway 60, between Highway 16 and Highway 16A: Twinning and grade separation at the CN railway tracks to improve safety and traffic flow.
- ◆ Highway 628: Consistent roadway surfacing is required to accommodate the commuter and anticipated commercial and industrial traffic. Upgrading this roadway would provide an alternate east/west regional connector that could divert traffic from Highway 16 and Highway 16A.
- ◆ Need more/additional transit routes.

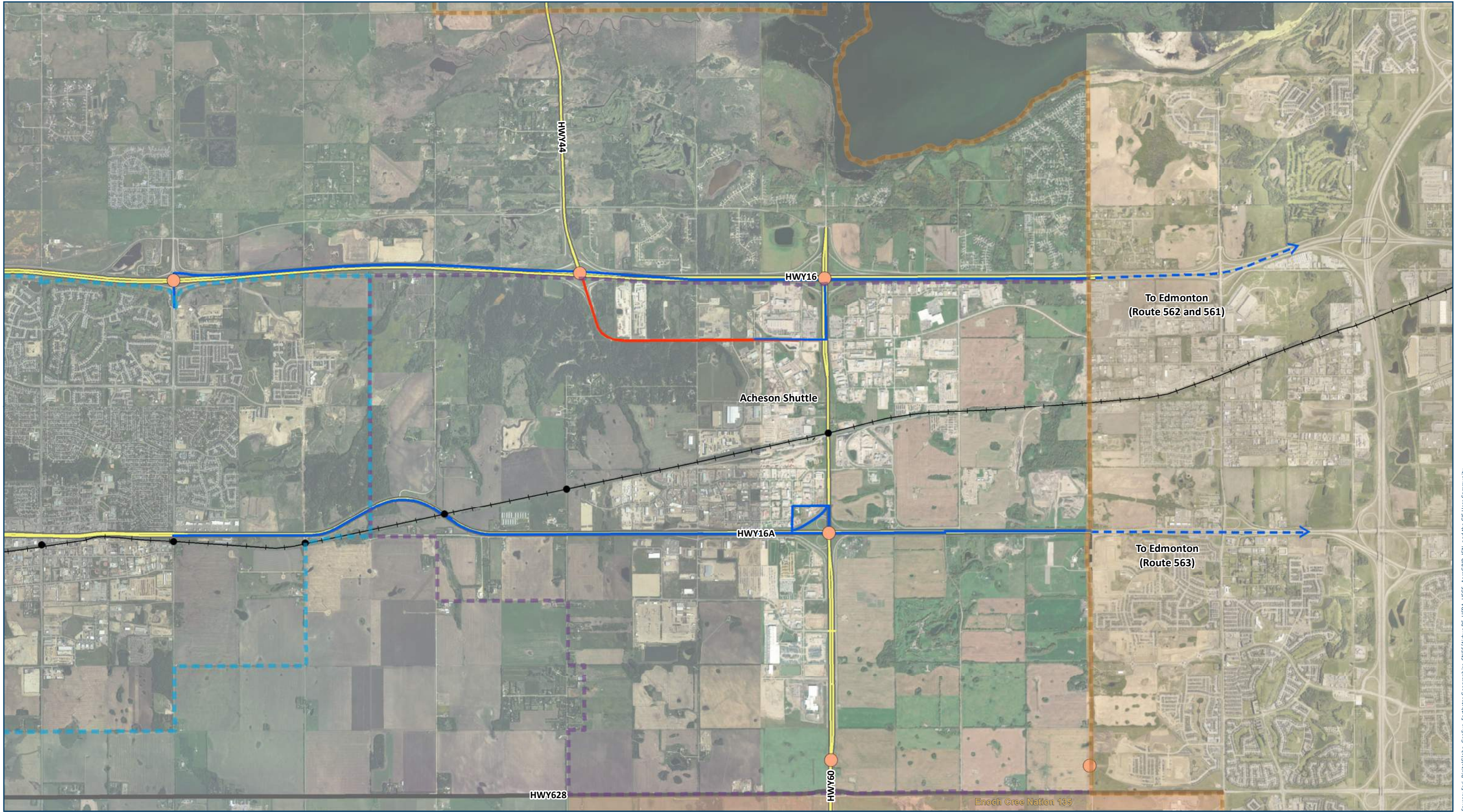
Combined transportation maps are provided for Stony Plain, Spruce Grove and Acheson in **Figures 5.11 to 5.13**.





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

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Date: 2021-03-26



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

5.4 Current Plans

Transportation policies, reports, studies, plans, initiative and others direct and impact planning for future growth and the following sections outline relevant items from each municipality.

5.4.1 Alberta Transportation

The following plans are understood based on information published online by Alberta Transportation, previous experience and information provided by the three municipalities.

- ◆ Freeway upgrades, Hwy 16 from Kapasiwin Rd to Hwy 779, 28 km in total. (A planning study has been completed to develop plans for the eventual conversion of Highway 16 to a freeway standard roadway between Kapasiwin Road and Highway 779. The purpose of this study is to develop a functional plan which: Identifies the ultimate interchange configurations and access management requirements that will accommodate long-term growth; Identifies service roads needed to provide access to adjacent lands; ultimately achieves 8 lanes along Highway 16; and identifies right-of-way requirements in support of the long-term highway plan.
- ◆ Highway 60: Planning and design has been completed for the twinning and rail-grade separation between Highway 16 and Highway 16A. Provincial funding was announced in the Fall of 2020 that the project will proceed with funding available in 2021 for utility relocations and land acquisition. It is listed as the third highest priority project ready for construction in the EMRB 2018 Regional Transportation Priorities.
- ◆ Highway 628: Upgrades project involves: Realignment and upgrading of Highway 628 from West of Campsite Road to Range Road 261(Edmonton West Corporate limits). The 15-kilometre Highway improvement project will realign Highway 628 to a new alignment. Engineering, land purchase and relocation of utilities will begin in 2019. Construction could start in 2021 subject to land purchases, utility relocations and environmental permits are in place. The project is expected to take four to six years to complete. Increased maintenance and rehabilitation activities can be expected
- ◆ Highway 633: A planning study has been completed to identify the future alignment and configuration from Highway 43 to Highway 779.
- ◆ Hwy 779 from South of Hwy 628 (Southern Town limit) to 47th Avenue in Stony Plain, 3.2 km in total. Widening and upgrading of Hwy 779 (48 Street) to a divided urban arterial standard including a raised concrete median from 47 Avenue to Willow Park North Access; and two lane semi-urban cross section from Willow Park North Access to southern Town limit. Access will be consolidated to major intersections with dedicated left turn bays. Contract will include grading, base course, paving, underground utility relocations, lighting, signals, and concrete work.

5.4.2 Spruce Grove

Municipal Development Plan (MDP)

- ◆ Conform with EMRBGP
- ◆ Pursue opportunities to increase linkages between different forms of transportation

- ◆ Incorporate multi-modal transportation needs and opportunities in the Transportation Master Plan
- ◆ Monitor traffic counts and movements to ensure that road capacity, design, and timing of capital improvements
- ◆ Implement roadway and interchange extensions and improvements to reduce congestion as the community grows
- ◆ Protect regional transportation corridors and facilitate the adequate movement of goods and services within and through Spruce Grove.
- ◆ Expand the capacity of the regional commuter service into Edmonton and explore options for a commuter service to Acheson Industrial Park in accordance with the recommendations in the Edmonton Metropolitan Region Growth Plan.
- ◆ Increase local and regional transit service in a way that is cost-effective, and uses land and moves people efficiently.
- ◆ Conduct a non-motorized transportation network analysis of already developed areas and identify gaps in this network and priorities for filling in these gaps.
- ◆ Improve pedestrian and cyclist access across Highway 16A and within industrial areas.
- ◆ Increase local employment opportunities
- ◆ Work with Stony Plain to determine:
 - ◆ the western alignment of Grove Drive and its relationship to Boundary Road (**Figure 9: Major Road Network** and **Figure 15: Boundary-Interface Planning Area**) ; and
 - ◆ the alignment of future roads and trail connections leading from the residential area south of Highway 16A into Stony Plain (**Figure 8: Future Land Use** and **Figure 15: Boundary-Interface Planning Area**)
- ◆ Work with Parkland County and Alberta Transportation to determine:
 - ◆ the eastern alignment of Grove Drive and its role as a potential connection to Acheson Industrial Park (**Figure 9: Future Road Network** and **Figure 15: Boundary-Interface Planning Areas**);
 - ◆ the impact of the western expansion of Acheson Industrial Park on Spruce Grove.
 - ◆ Highway 16A Corridor Enhancement Study update medium term initiative
 - ◆ Implementation Plan
 - ◆ Within 5 years
 - Update the TMP to align with the MDP, incorporating a multi-modal focus.
 - Update engineering standards to align with the MDP
 - Complete an analysis of the active transportation network and identify gaps in the network and priorities to fill in these gaps.
 - Develop a Public Transit Business Plan in conjunction with regional partners
 - Explore options for and feasibility of local and regional transit routes and the location of regional and local transit hubs
 - ◆ 5 – 7 years
 - Update the Highway 16A Corridor Enhancement Study

- Conduct a formal review of the MDP
- ◆ 8 – 10 years
 - Work with CN Rail and regional partners to address access across the rail-line and the impacts of increased service

2012 Transportation Master Plan

The TMP is a long term plan to guide development of transportation infrastructure to support the growth of the community and the City's long term goals and has been developed on the basis on the MDP. The TMP is centered around the following goals:

- ◆ Connect residential, business, and industrial communities effectively and efficiently.
- ◆ Enhance mobility and economic vitality by providing reasonable transportation choices for all residents and businesses
- ◆ Promote the safety and security of the transportation system
- ◆ Reduce vehicular travel with higher degree of mixed land uses
- ◆ Promote healthy and environmentally reasonable transportation choices

Future roadway projects include:

- ◆ Arterial conversion at Campsite Road, Century Road, and Golden Spike Road south of Highway 16A
- ◆ Additional lanes on Highway 16 east of Century Road with an upgrade of the interchange
- ◆ Beyond 2032, Additional lanes on Highway 16 west of Century Road

2018 Transit Annual Report

Conducted November 18, 2019, the Transit Annual Report is meant to provide an overview of the City's transit activities over the year, as per the MDP's policy to monitor transit ridership and expand public transit. The report provides current and historical revenues and costs, municipal contribution, ridership per capita, comparisons with other municipal transit services, route performance, and customer engagement. The report concludes the following:

- ◆ The average cost per hour of service is high and other alternatives may be possible.
- ◆ Monitoring has been a useful tool for managing scheduling.
- ◆ Key performance indicators will follow with transit standards and a longer-term transit operational plan.

2018 Financial Indicator Graphs Spruce Grove

The 2018 Financial Indicator Graphs provides a comparison of the City's financials per capital in 2018 based on the provincial median and maximum. Transportation is listed on Page 14 under major expenditures by broad function. Based on the data, the City's transportation expenditures per capita are consistent with other similar sized municipalities.

Building an Exceptional City, Strategic Plan 2018 – 2035

This document outlines the City council's visions for Spruce Grove from 2018 to 2035 and the necessary requirements to move forward. The plan includes the City's core values, strategies, and goals. The strategic plan is reviewed on an annual basis and updated every four years. The strategic plan elaborates on the vision for transportation and mobility in 2035, with a focus on efficient and effective transportation and mobility options for residents. This includes an integrated transportation network accommodating all modes, increasing connectivity, and a comprehensive transit program.

Corporate Plan 2020 – 2022

This document is the City's corporate business, department, and fiscal business plan for 2020 – 2022. The corporate plan outlines the plans and projects recommended for the City over the next three years. Transportation projects relevant to the Tri-Municipal area include:

- ◆ Arterial roadways and Hwy 16A resurfacing
- ◆ New growth transportation
 - ◆ Grove Drive East Twinning
 - ◆ Campsite Road Functional Plan
 - ◆ Pioneer Road top lift asphalt
 - ◆ Century Road from 16 A to south of Century Close
 - ◆ Golden Spike Road
 - ◆ Grove Drive west twinning
 - ◆ Campsite Road south
- ◆ Transit Park and Ride

Boundary Interface Planning Study

Completed in 2007, this study assesses the 1360 hectares between the City of Spruce Grove, Town of Stony Plain, and Parkland County. The purpose of the study is to provide long range development planning for the study area in the absence of an Intermunicipal Development Plan. One of the objectives of this study is to ensure the future transportation network within the study area serves the land use activities located within all three municipalities.

The study emphasizes the potential for growth that the proposed Highway 628 widening provides and proposes future north-south connections along Highway 628. This includes upgrades to Campsite Road, Golden Spike Road, and Century Road connecting to Highway 628. Campsite Road is envisioned to funnel traffic to Highway 16A, serving as the City's primary corridor. A comprehensive network of green nodes and corridors is also proposed to increase pedestrian and cyclist connectivity.

Economic Development Strategy and Action Plan

This plan is intended to provide direction on the City's economic development from 2017 to 2022. The document recommends that the road infrastructure in the older industrial areas to ensure it meets heavy haul standards and advocate for the construction of the Highway 628 heavy haul route with the Alberta government.

The plan was updated September 4, 2018 however no changes were made pertaining to the transportation items.

2015 Spruce Grove Transit Survey Results Report

This report summarizes the responses to on-board and online surveys pertaining to the City's transit services, with an aim to understand the needs of current transit users and potential transit users. The survey found that most on-board respondents were female at 68%, and that most respondents were aged 25 – 34 years. 76% of the on-board respondents' primary residence was in Spruce Grove, while 22% lived in Stony Plain and the remaining 2% in Parkland County. Of the on-board respondents, 68% indicated that they were using the transit service to commute to work, while 21% were commuting to post-secondary school. 33% of online respondents who indicated they did not use the transit service indicated that their daily activities were not convenient with transit.

The survey report provides several future directions for Spruce Grove's transit based on the survey results. This includes hourly service to West Edmonton Mall, higher bus frequency, adding service to Stony Plain, and potentially expanding local service.

2016 Spruce Grove Transit Survey Results Report

Like the 2015 transit survey, this report summarizes the 2016 Spruce Grove transit survey results. The survey found that most on-board respondents were female at 62%, and that most respondents were aged 18 - 24 years. 72% of the on-board respondents' primary residence was in Spruce Grove, while 14% lived in Stony Plain and 12% in Parkland County. Of the on-board respondents, 67% indicated that they were not a student, while 28% were post-secondary students. 43% of online respondents who indicated they did not use the transit service indicated that their daily activities were not convenient with transit.

The report compares survey results from 2011 and 2016, and provides a list of emerging themes. Some of the themes discussed include the desire for added service to West Edmonton Mall, modifications to the transit schedule to better suit professional, educational, and social obligations, the most common place for transit users to park is the Tri Leisure Centre, and non-transit users noting that the current transit service does not align conveniently with their daily activities.

Growth Study Addendum

The 2016 Growth Study was created to assess the City's potential growth over the next 50 years and determine how much land will be required to accommodate the projected growth. The addendum reviews the potential annexation area and ranks quarter sections based on serviceability. The transportation serviceability section is based on the proximity of each quarter section to existing roadways. The transportation serviceability assessment found that the quarter sections adjacent to Campsite Road, Golden Spike Road, and Century Road.

The City of Spruce Grove Enforcement Services 2019 – 2022 Traffic Safety Plan

The Traffic Safety Plan provides an overview of the City's enforcement profile, reviews the City traffic safety and provides direction on improvements. Highway 16A, Jennifer Heil Way, Grove Drive, Century Road, and Calahoo Road are prioritized in the 2019 – 2022 Traffic Safety Plan. The traffic safety goals within the plan include:

- ◆ Reduce the number of collisions along arterial roadways.
- ◆ Reduce the 85% percentile speed by Grove Drive West proximal to Spring Gate; Grove Drive by Grove Seniors Village and Grove Drive Proximal to Woodside Crescent.
- ◆ Continue to enhance data collection for enhanced analysis and review.

The plan recommends a combined approach using Safe Systems and vehicle occupant protection design to reduce the frequency and severity of traffic collisions. This is recommended for new roadways and upgrades as well as emphasizing the need to review existing infrastructure. The following are traffic safety engineering recommendations:

- ◆ Conduct a review of all crossings and apply correct engineering treatments by analysis of traffic volume and speed, pedestrian volumes, and condition assessment.
- ◆ Revise City of Spruce Grove Municipal Development Standards
- ◆ Installation of new Traffic Signal Lights at Jennifer Heil Way and Deer Park Drive collector route.
- ◆ Construction and utilization of roundabouts at Pioneer Road and Westwind Drive, Tonewood Blvd and Grove Meadows Drive

Spruce Grove City Centre Area Redevelopment Plan

The City has created an area redevelopment plan to outline future growth of the City centre, including roadway modifications and setting modal priorities.

Environmental Sustainability Action Plan

Completed in February 2011, the Environmental Sustainability Action Plan provides priority areas, goals, and strategies to direct the City's environmental sustainability approach from 2011 to 2021. One of the short-term strategies listed is encouraging alternative modes of transportation.

Understanding Municipalities Realities

A questionnaire Spruce Grove filled out for the Shared Investment for Shared Benefit (SISB) project. Spruce Grove does not note any transportation specific concerns.

5.4.3 Stony Plain

Strategic Plan

Completed in 2019, the Strategic Plan provides a vision for Stony Plain 20 years into the future. The plan notes a commitment to complete street design and planning for all modes of transportation.

Municipal Development Plan (MDP)

Stony Plain's MDP is intended to outline the community's growth and development over the next 30 years. The plan guides land use and development based on the Town's 30 year vision to build a complete, sustainable community by providing policy framework to guide decisions. Relevant policies relating to the transportation network are listed below.

Table 5.6: Stony Plain MDP – Transportation Policies

Number	Policy
4.1.a	The Town will design a transportation system that is based on a philosophy of an interconnected system of 'complete streets,'
4.1.b	The Town will place a high priority on bicycle facilities, sidewalks and other modes of active transportation for all-season access, maintenance and snow clearing.
4.3.a	The Town will work with its partners to develop an intermunicipal bus service to key employment nodes in the region.
4.3.c	The Town will continue to provide transportation services to meet the needs of seniors and residents with disabilities.
4.3.d	The Town will work with regional partners to explore alternative transportation options to increase regional connectivity.

Transportation Master Plan

In March 2021, Stony Plain published their new Transportation Master Plan, replacing their 2011 Transportation Study. The study focuses on transportation network improvements needed to support growth up to the 25-year horizon (2044) and provides detailed analysis of traffic operations at intersections and within the roadway network. The plan also identifies several follow up strategies and action items for improving and supporting other strategic areas of the transportation network including, road network strategies, safety strategies, infrastructure/maintenance strategies and supporting alternative transportation modes. Notable improvements supporting growth in the Tri-municipal region include:

- ◆ Several additional traffic signals connecting between Stony Plain roads and the provincial highways.
- ◆ Highway 779 widening from two to four lanes between Highway 16 A and north town limits and between Will Park Road and Highway 628
- ◆ Highway 628 widening from two to four lanes, between Highway 779 and Golf Course Road
- ◆ Network improvements supporting the transfer of Highway 779 and Highway 628 development authority to the Town.

- ◆ Proposed local transit route connecting between the Town and the Tri-leisure center with services planned to start in mid 2021.
- ◆ Implementation of active transportation improvements outline in the Active Transportation Strategy, including a review to determine feasibility of a second pedestrian tunnel under CN Rail.
- ◆ Network improvements to reduce impacts of rail crossings, including signal timing reviews, Intelligent Transportation System (ITS) improvements, advance warning systems, grade separation and others.

Active Transportation Policy/Strategy

The recent Active Transportation Strategy (2020) provides an updated inventory of sidewalks, crosswalks and trails, and provides best-practice design guidelines for supporting alternative transportation, including priority items for implementation. The TMP update will apply direction and expand on plans in this study where applicable.

Parks and Open Space Master Plan

An essential objective of the Parks and Open Space Master Plan (2015) is to improve integration of existing trails with bikeways, parking and links to surrounding communities, providing a comprehensive trail network within the Town. A key challenge identified is the need to work with CN and AT to provide better connections across the rail and highway corridors.

Environmental Stewardship Strategy

The Environmental Stewardship Strategy was originally prepared in 2007 and updated in 2011 and another update is currently underway anticipated in mid-2021. In terms of transportation issues, the update sets a strategic target to provide “access to and encourage use of alternative forms of transportation to reduce vehicle greenhouse gas emissions.” Specific actions are aimed at “proposing pedestrian-friendly infrastructure and programs”—specifically the strategy highlights the expansion of the Town’s multi-use trail system.

2018 Financial Indicator Graphs Stony Plain

The 2018 Financial Indicator Graphs provides a comparison of the City’s financials per capital in 2018 based on the provincial median and maximum. Transportation is listed on Page 14 under major expenditures by broad function. Based on the data, the City’s transportation expenditures per capita are a little more than half of what is spent per capita in similar sized municipalities.

Accessible Transportation Plan

Spruce Grove and Stony Plain will be merging their two services to create one regional service with a new name: Accessible Transportation Service (ATS). The ATS will be operated by the Town of Stony Plain and the storage and maintenance of the ATS service fleet will be facilitated by the established City of Spruce Grove Transit Service. The document is for coordinating plans for communicating the changes to users.

Corporate Plan

Stony Plain's Corporate Plan reflects the 2020 – 2022 operating and capital initiatives to support and achieve the Town's Strategic Plan. The Plan includes funding for the Tri-Municipal Transit Implementation in the form of \$948,000 in 2020, \$514,250 in 2021, and \$549,000 in 2022.

Downtown Redevelopment Plan

The Town has created an area redevelopment plan to outline future growth of the downtown, including roadway modifications modal priorities.

Old Town Community Plan

Completed in June 2019, the Plan is intended to provide the vision, policy framework, and implementation plan to direct future development of the Old Town community. The plan provides several transportation policies for within the plan area, including Parking, active transportation, and public transit.

Understanding Municipalities Realities

A questionnaire Stony Plain filled out for the Shared Investment for Shared Benefit (SISB) project. Stony Plain noted that Highway 779 and 628 are provincial highways which creates a challenge for development access approval and has an inconsistent service level with municipal streets.

5.4.4 Parkland County

Long Term Strategic Plan

The Long Term Strategic Plan provides direction in support of the County's long term vision. One of the directions within the plan is completing and implementing statutory plans and other large-scale plans. The County also emphasized developing the road and infrastructure network to ensure the safe and efficient movement of traffic, goods, and services through Parkland County.

Municipal Development Plan (MDP)

The MDP is intended to support the County's long term growth for the next 30 years. Policies are provided to guide long range planning and land use. The MDP identifies Entwistle as a priority growth hamlet, and Tomahawk and Duffield are listed as growth hamlets. Section 9 of the document details the County's policies for transportation and utility infrastructure. Policies related to the transportation system are listed below.

Table 5.7: *Parkland County MDP – Transportation Policies*

Number	Policy
9.1.1.a	The County will protect long-term transportation corridors to maintain a safe, coordinated, efficient and cost-effective road network.
9.1.1.b	Roadway planning should consider rail network, transit systems, airports and aerodromes

Number	Policy
9.1.2	The County will develop and maintain a Transportation Master Plan (TMP) to ensure alignment with the EMRB Growth Plan and the MDP.
9.1.3.b	Developers will be responsible for front-ending costs of on-site and off-site infrastructure systems. The County will, where applicable, endeavor to assist in cost recovery of oversizing and extension of municipal improvements that accommodate future development.
9.2.1	When making land use and development decisions the County will consider the safe, efficient and cost-effective provision of transportation infrastructure services.
9.2.3	Developments may be required to design road networks as far away as possible from environmentally significant areas, wildlife corridors or habitats and prime agricultural lands.
9.2.4.b	Legal and physical access must be provided by the Developer for any subdivision or development to the satisfaction of the County.
9.2.4.c	All external and internal roads used to serve a residential, multi-parcel lot or major development shall be paved to the satisfaction of Parkland County.
9.2.4.d	The County will require roadways to be developed to the current Engineering Design Standards of the County
9.2.4.f	The use of a panhandle roadway to obtain legal and physical access shall be avoided.
9.2.5.b	New developments shall comply with Alberta Transportation's standards for highway access management.
9.2.6	The County supports active transportation across the County and may consider designing multi-use roadways with wider shoulders for non-motorized trail activity along new or upgraded rural roadways.
9.3.1	Support a safe, resilient and reliable transit service that provides connections to the County's major employment areas, including Acheson Industrial Area.
9.3.2	The County supports and encourages community-led transit service programs, especially those for the elderly and people with accessibility needs.
9.3.3	The County supports the creation and implementation of a Regional Transit Plan.
9.4.1.a	The County will collaborate with CN Railway and Transport Canada to maximize rail access to the Acheson Industrial Area, Entwistle and other future developments that may require rail access where it provides benefit to the County.
9.4.1.b	The County and rail operations may participate in cost-sharing agreements related to infrastructure upgrades that are needed to ensure the safe operation of railways in the County where appropriate.
9.4.2	The County will work with AT to support the development of grade-separated crossings at strategic locations within the County.
9.4.3.c	All proposed developments within close proximity of a railway shall comply with current Federation of Canadian Municipalities and the Railway Association of Canada Guidelines for New Development in Proximity to Railway Operations.
9.4.3.d	All proposed development within close proximity of a railway right-of-way may be required to undertake a vibration study and subsequently to mitigate potential adverse effects from vibration that are identified.

Number	Policy
9.4.4	The County may consider purchase of any abandoned railway right-of-ways for the creation of public pathways, parks or other public use.

Acheson/Big Lakes TIA

The Acheson Industrial area is an industrial hub situated primarily between Highway 16 and Highway 16A and bisected by Highway 60. Big Lakes is a county residential area bounded by Highway 44 to the west, the City of Edmonton to the east, Highway 16 to the south, and Atim Creek to the north. Both areas have experienced significant growth over the years, and this study assesses the overall traffic impact of future growth in the two area.

Key items in the study include:

- ◆ Development of trip generation rates for industrial areas in Acheson.
- ◆ Proposed roadway networks for the short term, including:
 - ◆ Closure of Highway 16/Atim Road intersection
 - ◆ Highway 16A/Highway 60 interchange should be upgraded to its ultimate configuration
 - ◆ Highway 60 should be twinned north of Highway 16A and the CN Rail crossing should be grade- separated
 - ◆ Northview Road/Highway 60 intersection should be closed;
 - ◆ Pinchbeck Road/Bevington Road intersection should be aligned at Highway 16A with signalization of the Highway 16A/Bevington Road intersection.
- ◆ Proposed roadway networks for the long term, including:
 - ◆ Upgrades to the Highway 16/Highway 60 interchange are required including bridge widening to accommodate two northbound lanes;
 - ◆ Consideration should be given to extending 108 Avenue to Atim Road to provide existing traffic along Atim Road access to the signalized intersection at Highway 16A/Spruce Valley Road;
 - ◆ The Highway 628/279 Street intersection should be converted to a right in/right out/left in;
 - ◆ An interchange is required at the Highway 628/231 Street intersection.
- ◆ Proposed roadway networks for the ultimate term, including:
 - ◆ An interchange is required at the Highway 628/Highway 60 intersection;
 - ◆ With interchanges at Highway 60 and 231 Street, the Highway 628/Pinchbeck Road intersection should be closed.

Parkland County Strategic Overview

Administration report given to council to provide a summary of existing transportation planning documents as a means of supporting/justifying the need for a Transportation Master Plan (TMP). The document includes an overview of the transportation system bylaw, the previous TMP (not final), regional transportation network plan and the Acheson/Big Lake TIA. Two plans are shown as follows:

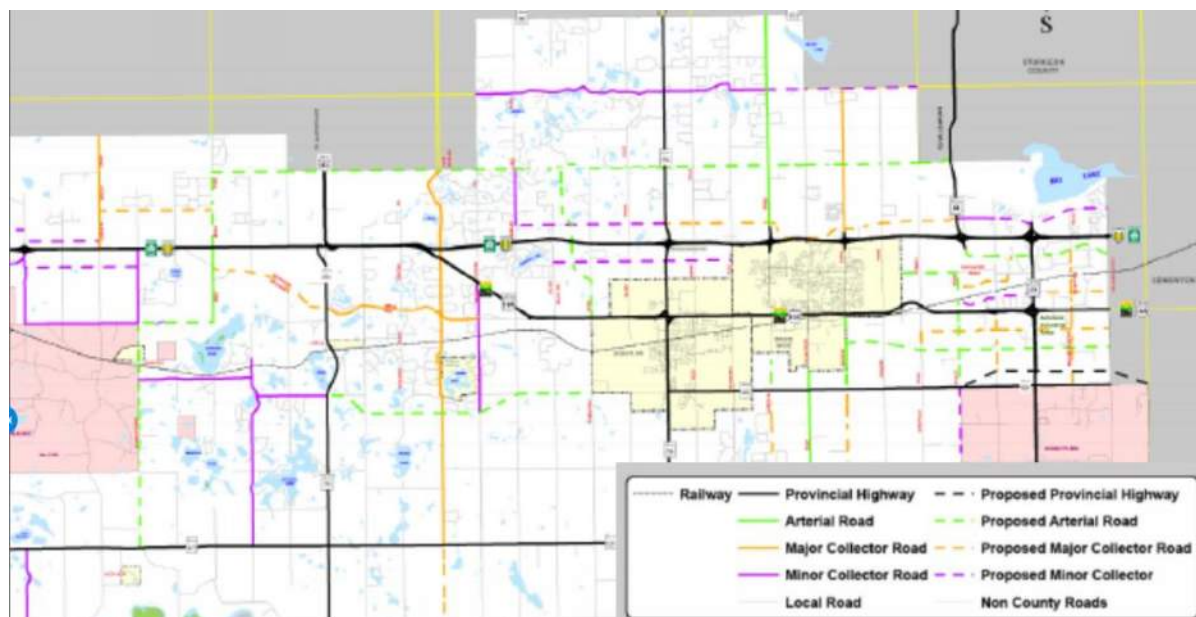


Figure 5.14: Parkland County Transportation Master Plan (not final/adopted by County)

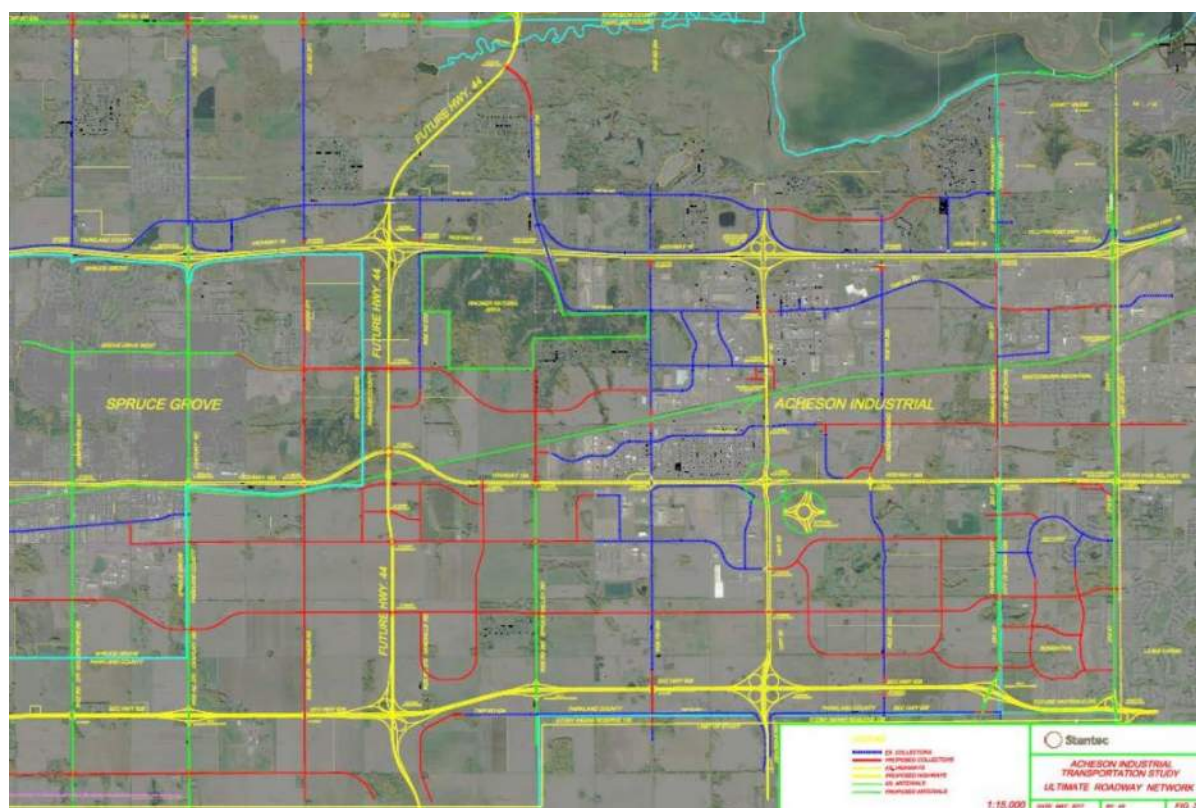


Figure 5.15: Acheson Industrial Ultimate Roadway Network (not adopted/approved by Council)

Notable plans included in the above figures, which may be worth exploring, include:

- ◆ New east/west arterial (proposed), connecting between Spruce Grove and the City of Edmonton, located between Highway 628 and Highway 16A.
- ◆ Plan showing the extension of Highway 44, south of Highway 16.

- ◆ East/west connections between Acheson and Spruce Grove along Grove Drive.

2018 Financial Indicator Graphs Parkland County

The 2018 Financial Indicator Graphs provides a comparison of the County's financials per capita in 2018 based on the provincial median and maximum. Transportation is listed on Page 14 under major expenditures by broad function. Based on the data, the County's transportation expenditures per capita is approximately half of the per capita spending in similar sized municipalities.

Technical Growth Study

The Technical Growth Study was completed October 2017, and is intended to identify, define, and prioritize land use planning decisions in the County. The document summarizes opportunities/constraints for growth as follows:

- ◆ Transportation/highway access & land requirements for upgrades
- ◆ Necessary regional infrastructure upgrades (costs to service)
- ◆ Levy structures and Cost recoveries
- ◆ Growth and intensification of land uses within Acheson requires investment in transportation/rail infrastructure
- ◆ CN Rail increasing rail traffic to Vancouver, doubling the length of trains, running trains every 15 minutes
- ◆ Highway system provides good access to northern Alberta, BC and Territories markets
- ◆ Further, grade-separation of the CN Rail Crossing at Highway 60 would address the extensive traffic delays caused by trains crossing the highway. This grade-separation may also create opportunity to introduce a new rail crossing that would provide better connectivity within Acheson, such as Range Road 264.

2020 Transportation Master Plan

Placeholder for future information as this is becomes available.

Understanding Municipalities Realities

A questionnaire Parkland County filled out for the Shared Investment for Shared Benefit (SISB) project. Parkland County notes that the need for provincial and federal funding on infrastructure including Highway 60 and Highway 628 is one of the County's growth pressures.

Offsite Levy Bylaw 2017

Off-site levy specific to area between Acheson, Spruce Grove, and Fifth Meridian Business Park ASP area, identifying \$132 M is costs for transportation improvements for supporting development in these areas.

Environmental Conservation Master Plan

This plan was created to provide an overview and classification of the various environmentally significant areas in Parkland County. The study notes that road salting should be reduced in the Big Lakes residential area.

5.4.5 Tri-Municipal

Tri-Municipal Regional Transit Plan

The Tri-Municipal Regional Transit Study (2018) outlines the focus for the future of transit services with Spruce Grove and Parkland County. The Plan determined three overarching priorities for improved transit in the Tri-Municipal Region:

1. The need for local service to connect communities within the Tri-Municipal area, in particular to serve the needs of youth, commuters, seniors and families.
2. Significant opportunities to better coordinate / integrate the various transit services.
3. The desire for more regional connection with Edmonton and Acheson, supported by continued growth of school and work commuter markets

Implementation of expanded regional transit services is underway with Stony Plain soon to be providing a connector bus to Spruce Grove with initial funding of \$500,000 from the federal government. Future transit plans are shown in the following figure.

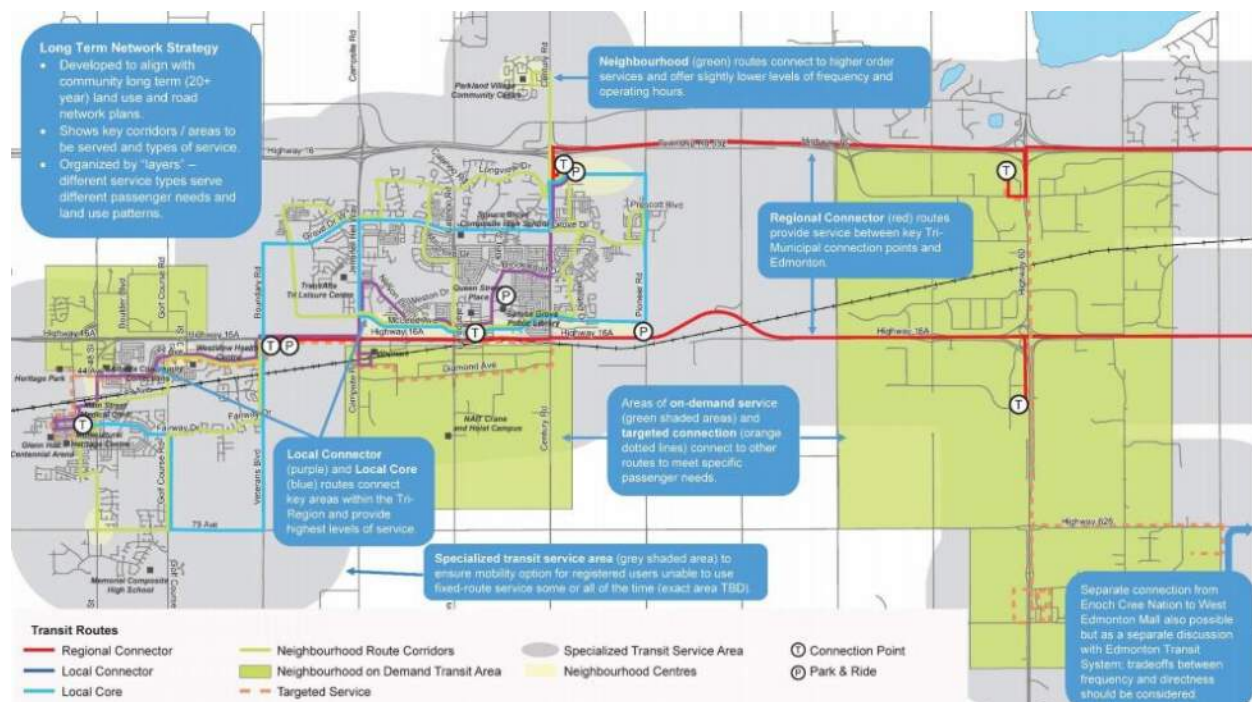


Figure 5.16: Future Transit Plans – City of Spruce Grove

The figure above shows the transit corridors running along sections of Highway 16A west of Century Road, Century Road and Highway 16 east of Century Road. The Tri Municipal Regional Transit Plan shows two Regional Connector routes, one following Highway 16A and the other following Highway 16.

Transit Bus Service Agreement

Effective January 2018, this document is an agreement between the City of Edmonton, City of Spruce Grove, and Parkland County to support commuter service, bus maintenance, and service for City of Spruce Grove's six commuter transit busses.

Memorandum of Agreement on Tri-Regional Transit

Signed June 2019, this document is an agreement between the City of Spruce Grove, the Town of Stony Plain, and Parkland County in support of tri-regional transit, detailing the basic agreement, responsibilities of parties, funding arrangements, and terms for termination.

Transit Report

Report which establishes the framework for a regional transit system in the Tri-Regional, including timings, phasing and key actions. The report explores several options service delivery models (public sector operation, public sector contract, private operating contracts and private operations) and provides considerations to recommend a service model. The desired service delivery is a public sector operation model. The report also outlines cost sharing for existing commuter routes, based on the home address of the ridership.

5.4.6 Edmonton Metropolitan Region Board (EMRB)

Integrated Regional Transportation Master Plan (IRTMP)

The Integrated Regional Transportation Master Plan (IRTMP) is currently in preparation with an anticipated completion date of mid-2021. Information on the plan may be available for reference as well as resulting updates in progress to Alberta Transportation's Regional Transportation Model. The support for the Land Use Scenarios phase should not be limited by the EMRB Plan but seek to achieve best return on investment through highest and best use of lands and efficiency of servicing.

From EMRB 2018 Priority Regional Transportation Projects

- ◆ Highway 60 (Highway 16A to Highway 16) Twinning & Rail-Grade Separation
 - ◆ Priority #4/12, Ready for construction
- ◆ Highway 628 (Highway 60 to Highway 779) Reconstruct and Surface Design unranked
- ◆ Whitemud Drive/Highway 628 (231 Street to Highway 60) Twinning Design unranked
- ◆ Highway 16 (Anthony Henday Dr. to Highway 779) Widening Functional/Concept Plan unranked
- ◆ Spruce Grove Regional Park n Ride New Park n Ride – Project Functional Planning or Study #19
- ◆ Highway 16 at Highways 43 & 770 Interchange 74.1 W10 – Project Functional Planning or Study #16

- ◆ Highway 16 (Anthony Henday Dr. to Highway 779) Widening – Project Functional Planning or Study #13
- ◆ Acheson Industrial Area Transit plus Park & Ride New Service and Park n Ride Study – Project Functional Planning or Study #4
- ◆ Regional HOV Transit Priority Study (Hwy 16, Baseline Rd./98 Ave, Wye Rd./ Sherwood Pk Fwy./ QE2 Hwy to Leduc) HOV Lane/ Transit Priority – Project Functional Planning or Study #1

Metropolitan Region Servicing Plan Report (MRSP)

The EMRB mandate is to provide collaborative regional leadership in the development and implementation of the EMRB Growth Plan and a Metropolitan Region Servicing Plan (MRSP) to meet the future population and employment needs of the Region. The MRSP Report provides a forward strategy and a comprehensive overview of the significant progress to date in developing the first MRSP. This report outlines a proposed strategic and operational direction, and the enabling structures necessary to achieve enhanced municipal collaboration and service coordination in regionally significant municipal service areas.

Transportation components in the MRSP are generally re-used from the 2011 IRTMP. Specific items worth noting, not already documented in the IRTMP are related to how transportation services are delivered in the future, including:

- ◆ new technologies changing how transportation systems are provided;
- ◆ changes to how existing transportation networks are used;
- ◆ changes in public policy, funding mechanisms, and priorities affecting the types of transportation services provided;
- ◆ maintenance costs for existing (and future) infrastructure affecting funding decisions;
- ◆ balancing the need to accommodate future changes while maintaining or limiting impacts on current services.

5.4.7 Edmonton Metropolitan Transit Service Commission (EMTSC)

On June 11, 2020, nine municipalities, including the City of Spruce Grove and the Town of Stony Plain, submitted a joint application to the Province of Alberta seeking to formally establish the RTSC and if approved is intended to begin delivering integrated service by 2022. Since the initial writing of this report, Parkland County has backed out of the RTSC.

Through the RTSC, there have been two significant studies conducted named “Accelerating Transit in the Edmonton Metropolitan Region: Building an Edmonton Metropolitan Transit Service Commission (January 2020) and addendum (June 2020)”. The conceptual design is shown in the following figure and is subject to further changes until the commission is fully operational.

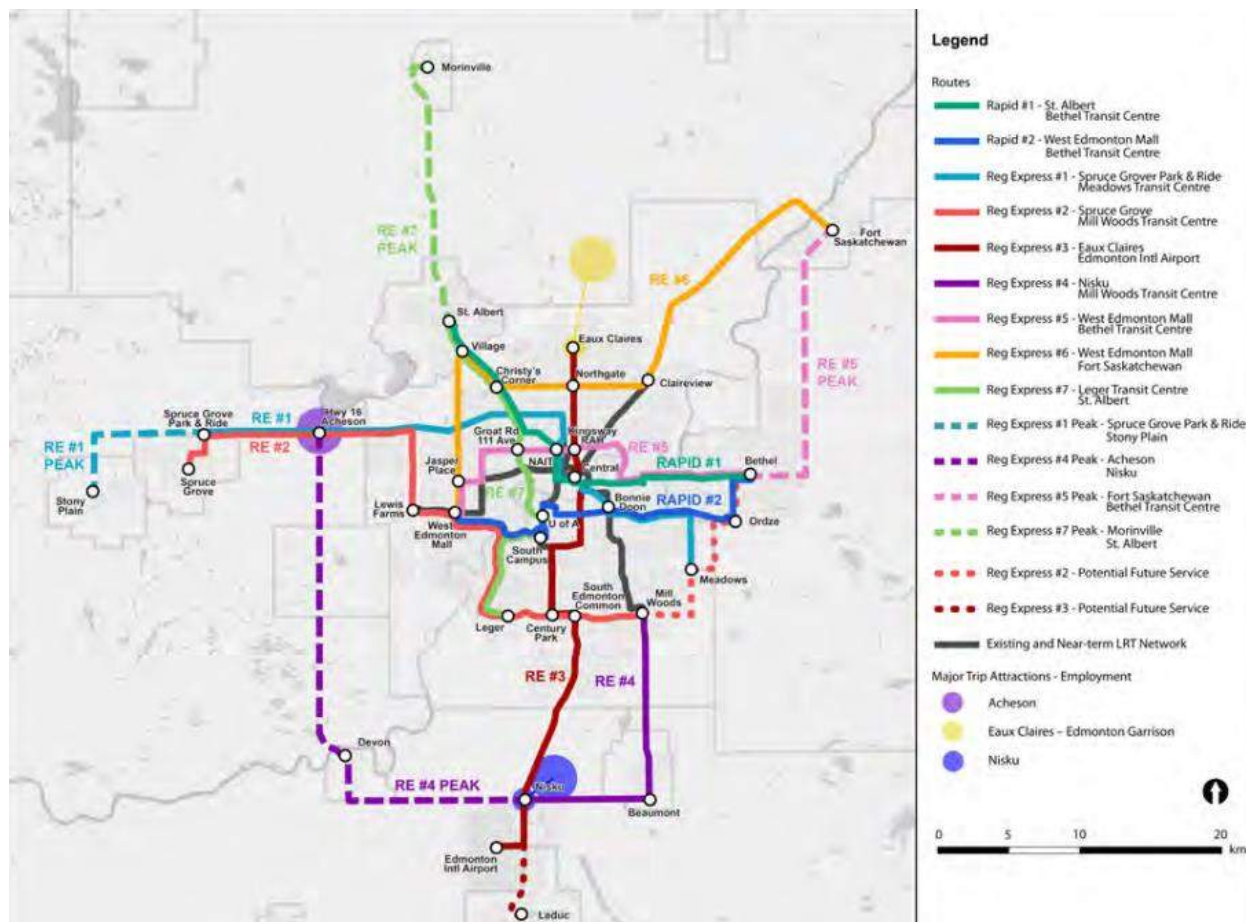


Figure 5.17: RTSC Conceptual Design

5.4.8 Preliminary Discussion

The following briefly describes current plans that impact the development of the transportation strategy. Additional details to be added as the project evolves and the information presented is further reviewed.

- ◆ Several transportation plans outlined in Acheson/Big Lakes TIA to account for in the land use planning.
- ◆ Several Alberta Transportation projects on the horizon also to account for.
- ◆ Potential extension/realignment of the Highway 44 corridor through Acheson.
- ◆ Potential extension of roadways connecting between Stony Plain, Spruce Grove and Acheson.
- ◆ Several transportation/land use policies for increasing transit and active transportation modes of transportation, consistent across the three municipalities.
- ◆ Transit service delivery (expected to be public operations).

6.0 EXISTING UTILITIES SYSTEMS

For the purpose of this report, the utilities considered in the TUI strategy include:

- ◆ Power transmission
- ◆ Power distribution
- ◆ Oil / gas pipelines
- ◆ Gas distribution
- ◆ Telecommunications

Water, wastewater and stormwater, though considered a utility, are not considered a utility in this context, and have not been included in this section. Please see sections 2.0 to 4.0 for consideration of water, wastewater and stormwater.

It is noted that utility companies, though regulated, generally manage their own systems and do not share information relating to system capacities and long-term plans with municipalities. Expansion and upgrading is generally done in response to servicing needs resulting once development plans are established, and based on the utility's individual business model. The design of utility networks, particularly utility distribution networks, is not generally as heavily influenced by factors such as topography, watershed, ground conditions. For this reason, the TUI strategy will be more heavily weighted towards priorities resulting from the transportation, water, wastewater and stormwater considerations.

The focus of this section, and the utilities strategy as a whole, is to generally identify where major utility systems exist and provide utilities' plans (existing and future) where they are available or where they are willing to share them.

6.1 Overview of Documents Reviewed

The Tri Municipal Region was unable to provide GIS for utilities as detailed in section 6.0. A list of utility service providers was provided for Parkland County and for Spruce Grove. No list was available for Stony Plain. The utility service providers listed, with associated notes, are summarised in **Table 6.1** below. Note that consideration of Capital Region Water Commission and Alberta Capital Region Wastewater Commission assets is covered under sections 2.0 and 3.0 respectively.

Table 6.1: *List of Utility Service Providers as provided by Parkland County and Spruce Grove*

Utility	Source	Notes from Municipality (where provided)
Alberta Capital Region Waste Water Commission	Parkland County	DOES NOT PROVIDE SERVICE TO RESIDENTS OR BUSINESSES. This is a Sewage Transmission Company; in a few cases they have private connections that resulted as part of the original ACRWC right of way negotiations with private landowners who's land was being crossed.
AltaLink	Parkland County	DOES NOT PROVIDE SERVICE TO RESIDENTS OR BUSINESSES. They transmit high voltage power from power plants to sub stations.
ATCO Gas	Parkland County	Atco Gas has distribution lines roughly east of the Fifth Meridian Business Park area. In this area, per Utilities link managed by Planning on our website, customer chooses service provider from the Utilities Consumer Advocate Retailers and Distribution information page.
ATCO Pipelines & Liquids	Parkland County	DOES NOT PROVIDE SERVICE TO RESIDENTS OR BUSINESSES. They transport petroleum products on high pressure pipeline systems to refineries or from refineries to market.
Capital Regional Water Commission	Parkland County	DOES NOT PROVIDE SERVICE TO RESIDENTS OR BUSINESSES. This is a water Transmission Company; in a few cases they have private connections that resulted as part of the original CRPWSC right of way negotiations with private landowners who's land was being crossed.
Fortis Alberta	Parkland County	FORTIS has distribution lines throughout the County, as does EQUUS and other Rural Electrical Associations. For power, per Utilities link managed by Planning on our website, customer chooses service provider from the Alberta Utilities Commission information page.
Telus	Parkland County	Engineering Services meets with the distribution side and has no dealings with the service provider side of Telus. Many residents are now choosing mobile as well.
Evergreen Gas Co-Op*	Parkland County	BOTH DISTRIBUTION COMPANY AND SERVICE PROVIDER. They have a franchise area in which customer can only receive gas from.
Pembina Pipeline	Parkland County	DOES NOT PROVIDE SERVICE TO RESIDENTS OR BUSINESSES. They transport petroleum products on high pressure pipeline systems to refineries or from refineries to market.
Ste. Anne Gas Co-Op*	Parkland County	BOTH DISTRIBUTION COMPANY AND SERVICE PROVIDER. They have a franchise area in which customer can only receive gas from.
West Parkland Gas Co-Op*	Parkland County	BOTH DISTRIBUTION COMPANY AND SERVICE PROVIDER. They have a franchise area in which customer can only receive gas from.

Utility	Source	Notes from Municipality (where provided)
Parkland County	Parkland County	Provides water and sewer to Acheson, Big Lake, and Entwistle. Provides sewer only to Tomahawk, Duffield, at Atim Creek Estates.
EPCOR	Spruce Grove	Provides broadband, gas and electricity.
Direct Energy	Spruce Grove	Provides gas and electricity.
ATCO Gas	Spruce Grove	
Fortis Alberta	Spruce Grove	
Telus	Spruce Grove	
Shaw	Spruce Grove	
West Inter-Lake District (WILD)	Parkland County	Provides regional water to areas north and west of Stony Plain.

GIS information was obtained through IHS Markit, a commercial data vendor that builds data sets available for purchase. This included mapping information for Telus, low pressure and high pressure pipelines. Existing utility infrastructure information is discussed in more detail in section 6.3 below.

6.2 Governance

The **Alberta Utilities Commission (AUC)** regulates Alberta's investor-owned electric, gas, water utilities and certain municipally owned electric utilities. The AUC also regulates the routes, tolls and tariffs of energy transmission through utility pipelines and electric transmission and distribution lines. Companies who propose to construct or rebuild electric generation, transmission or distribution facilities in Alberta, must apply to the Commission for siting approval. When reviewing the utility's application, the Commission considers the social and environmental impacts, as well as any economic implications for the ratepayers.

Companies included in this study that are regulated by the AUC are listed below:

- ◆ AltaLink Management Ltd
- ◆ Alberta Electric System Operator (AESO)
- ◆ ATCO Gas
- ◆ ATCO Pipelines
- ◆ Direct Energy Regulated Services
- ◆ EPCOR Distribution Inc
- ◆ EPCOR Energy Services
- ◆ FortisAlberta Inc

The AUC does not regulate:

- ◆ Rural electrification associations (REAs)
- ◆ Municipally owned utilities, with the exception of EPCOR in Edmonton and ENMAX in Calgary.
- ◆ Natural gas co-ops

The **Alberta Electric Systems Operator (AESO)** manages and operates the provincial power grid. It is a not-for-profit organization responsible for the safe, reliable and economic operation of the province-wide electric transmission system, and is responsible for overall system planning and real-time operating the electric transmission system. If the AESO has identified a need for new or upgraded transmission lines, substations or other transmission system equipment, it must prepare a Needs Identification Document (NID) containing a recommendation for addressing the identified system need. NID applications are subject to AUC approval. The tariff charges of each Alberta transmission facility owner are paid by the AESO and are flowed through to high voltage load customers including Alberta distribution utilities through rates set out in the AESO's transmission tariff. The AUC is responsible for approving the rates and terms and conditions of service of the AESO's tariff.

The **Alberta Energy Regulator (AER)** is responsible for activities that relate to oil, bitumen, natural gas, and coal development. It is noted that the AER has no authority over any of the following:

- ◆ gasoline or other refined petroleum products
- ◆ oil and gas pipelines that cross provincial or international borders (these are regulated by the Canadian Energy Regulator)
- ◆ any aspect of electricity generation or distribution, including renewable energies
- ◆ the price of natural gas (these are regulated by the Alberta Utilities Commission, or AUC)
- ◆ gas utility pipelines (again, these are regulated by the AUC, although the AER does inspect these pipelines and provide incident response on the commission's behalf)

6.3 Existing Utility Infrastructure

Figures 6.1 to 6.4 show existing utility infrastructure for Communications (Telus only), Power (transmission lines only), and Pipelines (low pressure and high pressure), respectively.

Information detailed in Figures 6.1, 6.3 and 6.4 was obtained from IHS Markit. The information obtained from IHS Markit has limited metadata and therefore the accuracy cannot be guaranteed by ISL. The level of detail and accuracy is assumed to be acceptable for this initial planning study background review. For more detailed assessment of utilities as the planning study progresses, further discussion with individual utility companies will be required.

Generally, utilities that influence land use planning to a significant extent are transmission lines (power lines, oil and gas pipelines).

- ◆ Existing utilities
 - ◆ Existing utilities are required to follow regulations on setbacks for future land use planning. This is primarily relevant to high voltage power and oil/high pressure gas transmission lines from future residential land uses.
- ◆ Future utilities
 - ◆ Pipelines do not generally share their planning information until the plan is already moving ahead and is therefore in the public domain. The existing map of pipeline corridors is reasonably useful for predicting where future facilities will be installed since there is a tendency to follow the existing facilities.

- ◆ AESO (Alberta Electric System Operator) 2019 and 2020 long-term plans for power transmission do not indicate any upgrades or new lines within the study area.

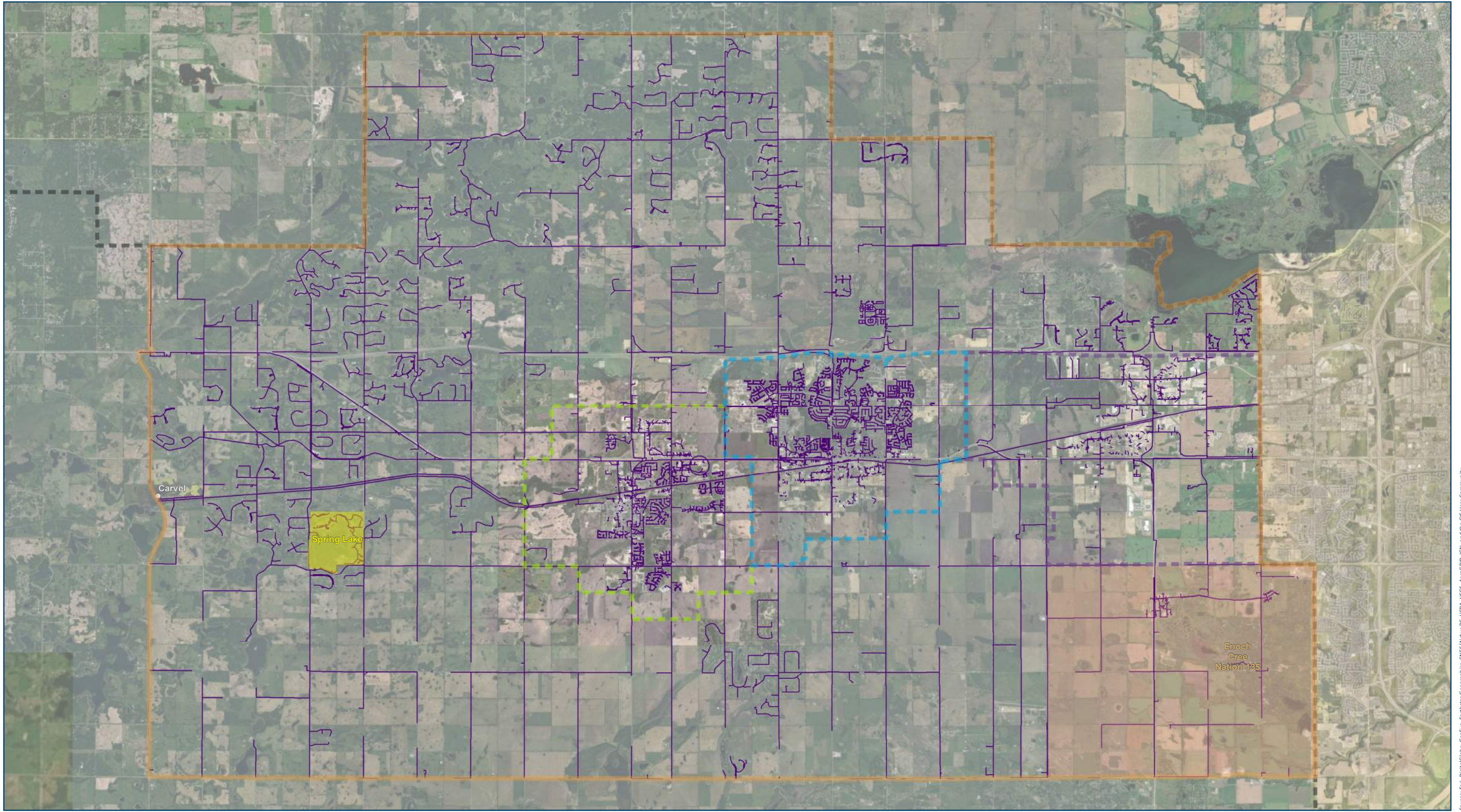
It is noted that broadband, or the lack thereof, can be a constraint to economic development. The cost to bring broadband into a future subdivision can be a factor in determining where development occurs; however, the major broadband providers themselves have indicated that they do not undertake long-term planning, and investment in facilities generally follows wherever there is development, unless there is specific investment from other sources such as municipalities or individual businesses.

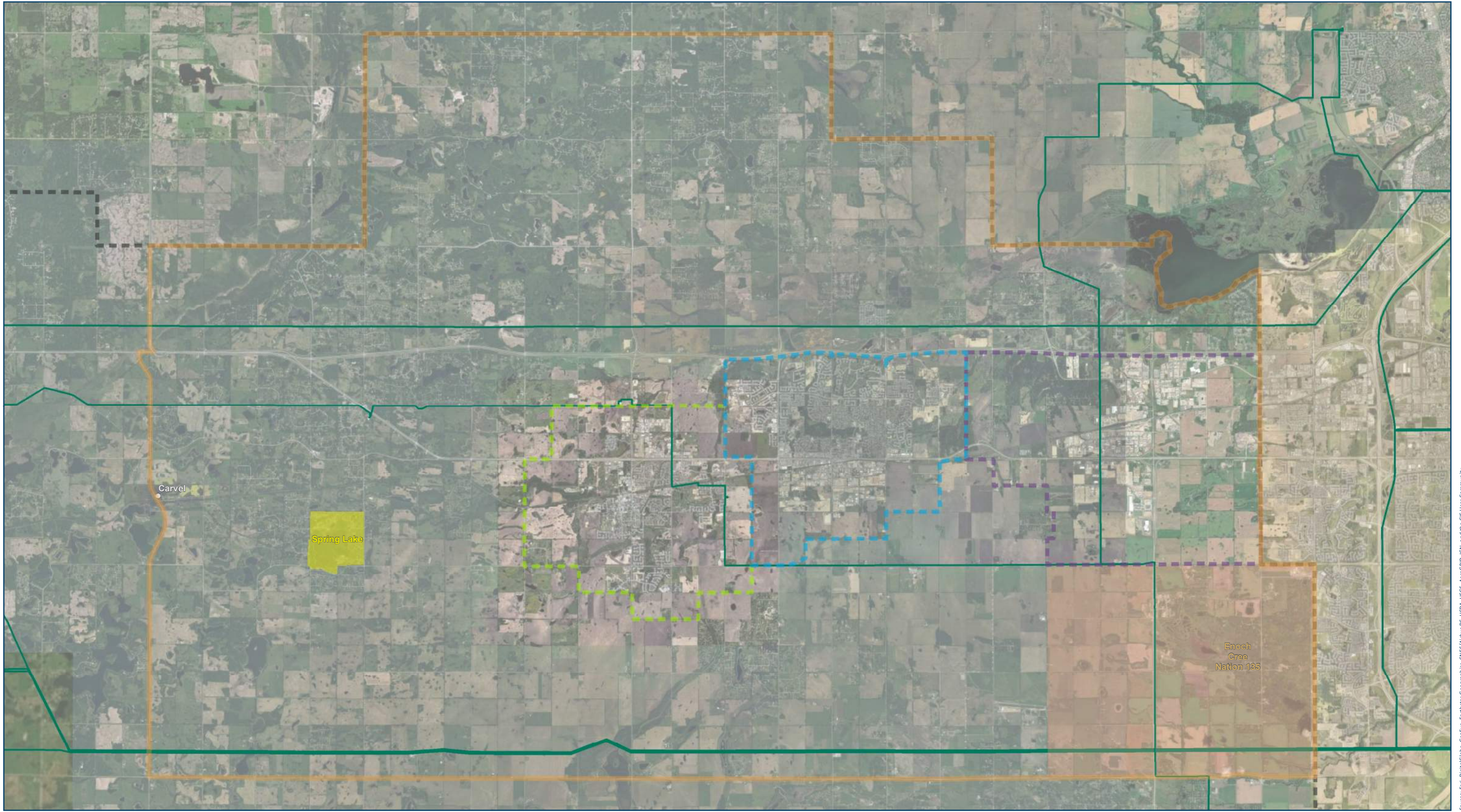
Although broadband will not influence land use planning to the same extent as Transportation and Infrastructure, the Canadian Radio-television and Telecommunications Commission (CRTC) recognizes ‘that a well-developed broadband infrastructure is essential for Canadians to participate in the digital economy.’ The CRTC does not yet have minimum service standards for Internet speeds but have set targets. The targets state ‘By the end of 2021, we expect 90% of Canadian homes and businesses will have access to broadband speeds of at least 50 Mbps for downloads and 10 Mbps for uploads.’

Table 6.2: 2019 Infrastructure Data from the Alberta Regional Dashboard

	Parkland County	Spruce Grove	Stony Plain
Median Upload Speed	0.47Mbps	1.14 Mbps	5.94 Mbps
Median Download Speed	7.94 Mbps	7.17 Mbps	13.8 Mbps
Average Latency	94.3 Millisecond	437.3 Millisecond	138.6 Millisecond

As is shown in the table above, the 2019 internet speeds do not meet the CRTC targets. To ensure economic development in the region it is recommended these targets are achieved. In order to achieve this municipalities should undertake a coordinated approach to evaluating cost, opportunities and constraints to providing broadband to the region.





TRI-MUNICIPAL
REGIONAL PLAN

0 0.75 1.5 3 4.5 6 km
Coordinate System: CANA83-3TM114

1:110,000

Tri-Municipal Plan
Prime Area of Focus

Parkland County

City of Spruce Grove

Town of Stony Plain

Acheson Industrial Area

Hamlet

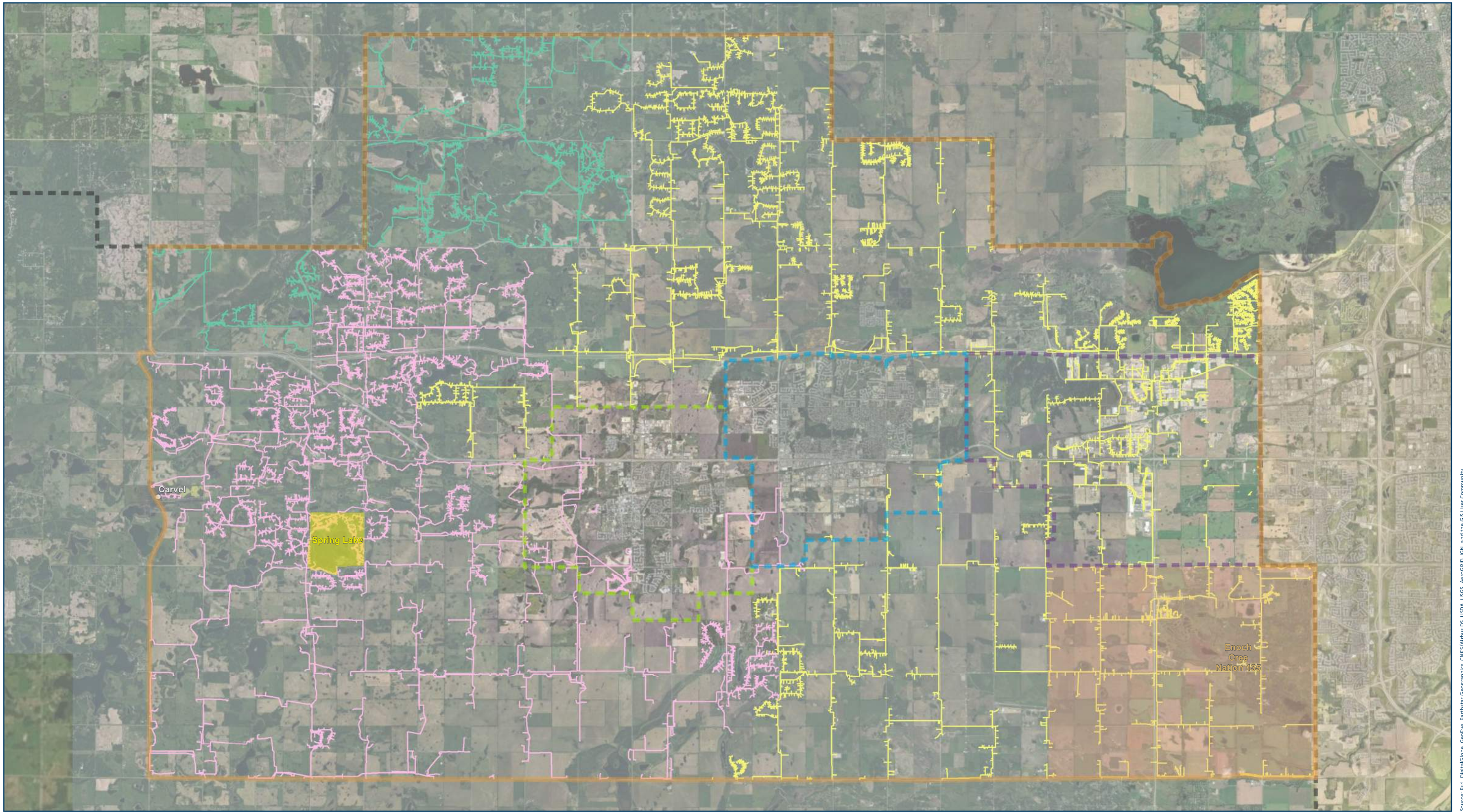
Other Urban Municipality

First Nation

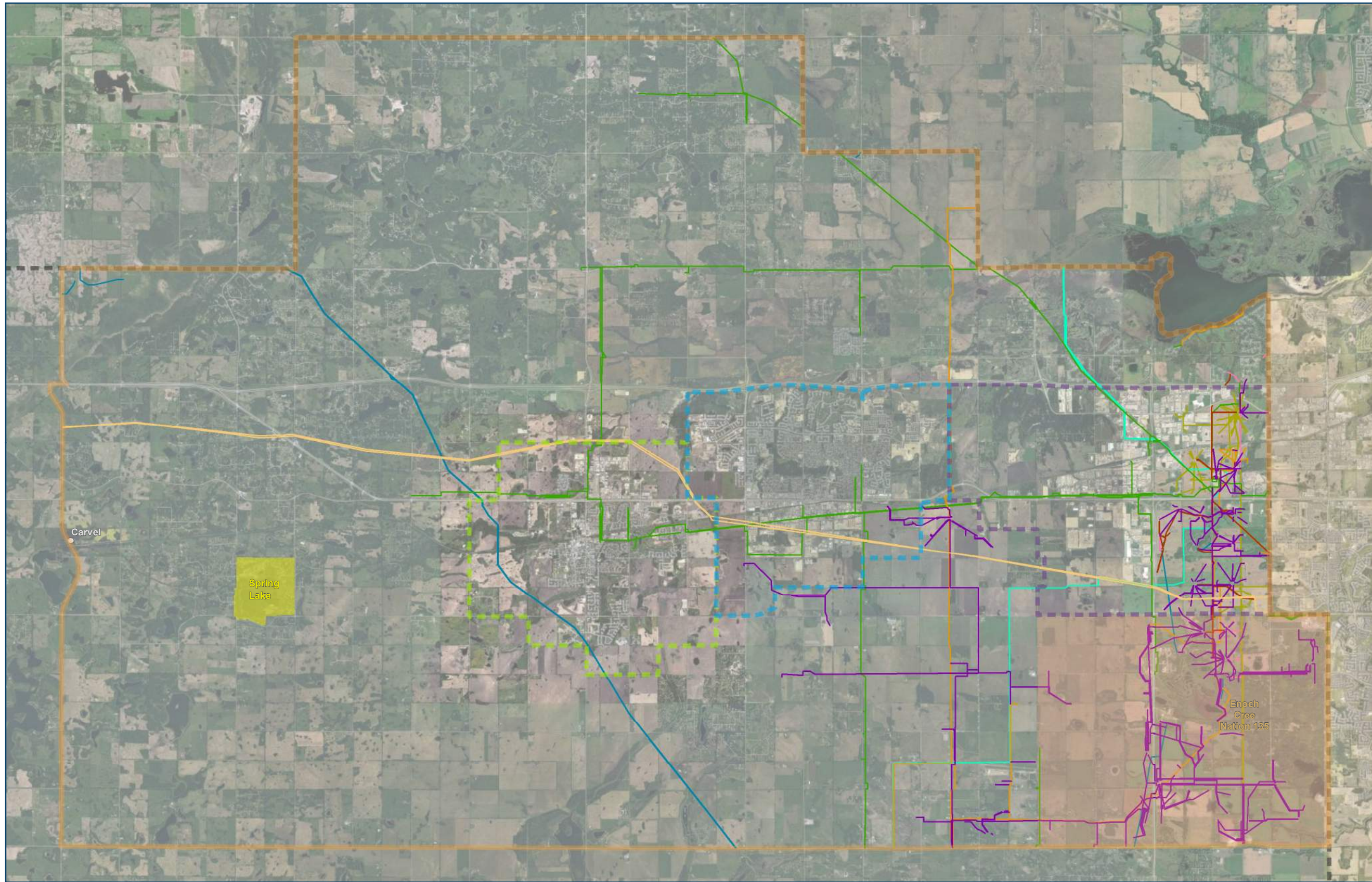
Existing Power Transmission Line

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 6.2
EXISTING
POWER LINES



Document: \\edms2\GIS\15739_Trans_Uilities_and_Infra_Strategy\02_CADD\25_GIS\251_Figures\15739_Base_Template_210326.mxd
Date: 2021-03-26



High Pressure Pipelines (by Operator)

- MAGA ENERGY OPERATIONS LTD.
- ATCO GAS AND PIPELINES LTD.
- OBSDIAN ENERGY LTD.
- INPLAY OIL CORP.
- IMPERIAL OIL RESOURCES LIMITED
- TIDEWATER MIDSTREAM AND INFRASTRUCTURE LTD.
- PEMBINA PIPELINE CORPORATION
- TRANS MOUNTAIN PIPELINE ULC
- OTHER:
 - LEDDY EXPLORATION LIMITED
 - NEP CANADA ULC
 - PLAINS MIDSTREAM CANADA ULC
 - LONG RUN EXPLORATION LTD.
 - TAQA NORTH LTD.
 - CHEVRON CANADA LIMITED
 - HUSKY OIL OPERATIONS LIMITED

Note: Infrastructure only shown within study area

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

TRI-MUNICIPAL
REGIONAL PLAN

Coordinate System: CANA83-3TM114

1:110,000

Tri-Municipal Plan
Prime Area of Focus

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City of Spruce Grove

Town of Stony Plain

Acheson Industrial Area

Hamlet

Other Urban Municipality

First Nation

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 6.4

EXISTING
HIGH PRESSURE LINES

6.4 Current Plans

Initial contact has been made with all of the companies listed by Parkland County and Spruce Grove. Generally an initial contact has been established for all companies, with the exception of Pembina and Shaw. Generally at this stage, information relating to existing and planned infrastructure from the utility companies is still outstanding from the service providers.

Evergreen Gas Coop has confirmed that their franchise area is outside of the study area.

AltaLink has confirmed that any planning relating to power lines (including AltaLink, FortisAlberta) is done by AESO and therefore direct contact has been made with that organization to discuss power line planning for the study area.

From the data obtained from IHS Markit, several other transmission pipeline companies have been identified within the study area, in addition to those identified by the SMEs. Transmission pipelines are shown on **Figure 6.4**. It is recommended that contact is made with each of these companies to determine whether they have future plans within the study area.

The City of Spruce Grove completed a Fibre Optic Broadband Strategy Study in June 2019. The study provided recommendations, a preliminary business case, and a high-level deployment plan for providing broadband to the City. Further to completion of the strategy, Spruce Grove received \$4.25 million in Municipal Stimulus Program funding to expand the fibre optic network in the city's commercial and industrial areas. The project will provide reliable and affordable high-speed broadband services and provide the basis for the extension of 5G and Smart Cities.

In order to attract economic development, the Town of Stony Plain and Parkland County need improved Broadband services. In order to strategically make and fund these improvements, Stony Plain and Parkland County should also complete a Fibre Optic Broadband Strategy Study, similar to that prepared for Spruce Grove. This study could be coordinated, and also take into consideration that done for Spruce Grove, to allow for potential savings and synergies in strategy.

7.0 HIGH LEVEL SERVICING STRATEGIES

7.1 Introduction

The following strategies were developed before the preferred land use scenario was available and focuses on big picture ideas for providing more cohesive transportation, utility and infrastructure servicing for the Tri-Municipal region. This was presented to the project administration team and subject matter experts from the three municipalities. Strategies are focused on those which benefit the tri-municipal region and are summarized in terms of benefits and challenges for their implementation.

Strategies that are deemed feasible, providing sufficient benefit compared to the challenges are recommended to pursue as active items based on the three following categories:

- ◆ **Foundational:** Projects in this category are considered critical to serving the growth of the Tri-Municipal region and are recommended to be addressed in the short term to enhance the Region's competitive position. Foundational projects typically have existing studies or documents supporting the need for the improvement, or the need for the project is relatively easy to prove. Improvements to existing infrastructure to increase capacity and improve connections to key infrastructure would be considered foundational projects.
- ◆ **Developmental:** Projects in this category improve network connectivity and could be pursued as opportunities allow. Developmental projects improve the Tri-Regional transportation network by providing integrated connections such as connecting the roadway network between Stony Plain and Spruce Grove. These projects typically involve slightly more effort or capital to achieve, such as connecting existing arterials between two municipalities.
- ◆ **Aspirational:** These projects represent a longer-term direction for Region. Projects in this category may be pursued but are more challenging in terms of scope and costs, and represent a significant deviation from the current status quo. More study is needed, and projects in this category are discussed for consideration.

Strategies are provided for each service area in the following sub-sections.

7.2 Over-Arching Strategies

The following strategies cover multiple disciplines (e.g. municipal infrastructure and transportation):

7.2.1 Harmonization of Off-site Levies

The three municipalities currently run parallel off-site levy programs for water, wastewater, stormwater, and transportation. The region can harmonize the off-site levy programs by using consistent criteria, documentation, etc. This is considered a relatively low-cost strategy with modest benefits to the region and its developers.

- ◆ **Opportunity:** Conducting joint off-site levy studies could reduce the cost of external consultants through improved efficiencies.

- ◆ **Benefit:** Simplifies workload for developers and/or potential investors by providing them a consistent off-site levy structure for the entire tri-municipal region that would have the same look/feel regardless of project locating in either municipality.

■ **Recommended as a foundational action item.**

7.2.2 Development of Common Municipal Design Standards and Guidelines

One way to promote economic development within the Tri-Municipal Region is to simplify the development process undertaken by developers. Developing common municipal design standards is considered a relatively low-cost strategy with modest benefits to the region and its developers.

- ◆ **Challenge:** Site specific issues may require municipalities to have specific design standards (e.g., cold mix pavement with the County).
- ◆ **Challenge:** Increased costs where certain areas adopt higher roadway standards compared to current plans, specific issue in Acheson with no sidewalks/trails plans and rural drainage.
- ◆ **Opportunity:** Most municipal standards are very similar and minor changes to the standards will not affect the development.
- ◆ **Opportunity:** Common design standards can have exceptions that apply to specific municipalities.
- ◆ **Benefit:** Reduced effort and cost to plan and design new developments as they are consistent across the municipalities.
- ◆ **Benefit:** Reduced review effort/time for administration with more consistency between designs and may allow shared/centralized resources.

■ **Recommended as a foundational action item.**

7.2.3 Explore Shared Use of Engineering and Public Works Services

The municipalities currently use in-house resources to carry out dozens of engineering and public works related activities. These range from review of developer-submitted reports and construction drawings to operation and maintenance of municipal (water, storm, wastewater) or transportation infrastructure. Sharing staffing resources on an as-needed basis can take pressure off over-taxed municipal staff. This can also apply to municipal owned equipment that can be shared on an as-needed basis or through a more permanent resource sharing plan.

- ◆ **Challenge:** Municipalities have unique ways of doing things that cannot necessarily be conducted efficiently by outside staff.
- ◆ **Challenge:** There will likely be impacts on soft resources such as unionized staff, HR, safety, etc. that will preclude some sharing of resources
- ◆ **Opportunity:** Sharing of resources can be conducted on an as-needed basis, only when it makes sense to do so.
- ◆ **Benefit:** Potential for more efficient use of staff resources and equipment.

■ **Recommended as a developmental action item.**

7.3 Water

It is noted that the three municipalities currently cooperate with the Capital Region Parkland Water Services Commission. The commission currently buys water from EPCOR Water Services and pumps it to reservoirs within the three municipalities (Acheson area for Parkland County). Thus, the current high-level strategy for water supply and treatment (via EPCOR) and transmission (via commission) is working very well. The commission also supplies water to the West Inter Lake District (WILD), of which Parkland County uses to supply water to some of its rural customers.

The following strategies are proposed for the region to consider.

7.3.1 Consider Joint Water System Planning

Municipalities currently conduct water master plans based on growth needs and focuses on the individual municipality. The master plans require budget approval, and the timing varies by municipality.

- ◆ **Challenge:** Joint planning would reduce flexibility for individual municipalities.
- ◆ **Opportunity:** Easy and cost effective to initiate joint planning through inter-municipal collaboration. Conducting water master plans for larger area is more cost effective.
- ◆ **Benefit:** Potential reduction or deferment of major water system costs such as reservoirs and an associated reduction of capital investments.

■ **Recommended as a foundational action item.**

7.3.2 Create Emergency Connections Between Water Distribution Systems

Where municipal water distribution systems are in proximity and/or where their supply is vulnerable (e.g., single source of supply), the systems should be connected for emergency supply purposes. Each municipality's distribution system would be hydraulically isolated, operating as separate systems with a valve that is opening only during emergency situations (e.g., fire, loss of power to reservoir / pumphouse).

- ◆ **Challenge:** Potential for water to be stale adjacent to emergency connection between municipalities.
- ◆ **Opportunity:** The existing pressure zones are similar and are not expected to be a constraint.
- ◆ **Opportunity:** There are several locations where the future Spruce Grove and Stony Plain water distribution systems are in close proximity. The Parkland County Fifth Meridian Business Park ASP area and Stony Plain system will also be close.
- ◆ **Benefit:** Emergency source of supply.

■ **Recommended as a developmental action item.**

7.3.3 Consider Shared Water Infrastructure

There may be some limited opportunities for sharing water infrastructure between adjacent municipalities. Municipalities construct or expand storage reservoirs when the total required storage volume exceeds the current reservoir capacity. If the water distribution system can be integrated, the calculation can be based on the overall storage requirements rather than the individual requirements. This will generally allow municipalities to defer the reservoir construction or expansion and related capital costs. The order of magnitude cost savings is estimated to be a deferment of \$5M to \$10M for a period of about 20 years if storage reservoir construction in Stony Plain or Fifth Meridian ASP can be deferred.

- ◆ **Challenge:** Shared ownership requires a formal agreement, and the benefit may not justify the effort needed to set up the agreement.
- ◆ **Challenge:** A long-term joint use agreement would need to be set up between the partnering municipalities. Agreement would need to consider risks associated with transferring water between municipalities if and when needed.
- ◆ **Opportunity:** Current projections require Stony Plain, and Parkland County Fifth Meridian ASP to construct storage at approximately the same time.
- ◆ **Opportunity:** It is much more efficient to construct a single large reservoir than a series of smaller reservoirs if they are in close proximity.
- ◆ **Benefit:** Reduced servicing costs.

■ Recommended as an action item.

7.3.4 Develop Joint Water Conservation Strategy

The City of Spruce Grove has initiated a water conservation program, as have several other municipalities in the Edmonton Metro area including EPCOR Water. Water conservation programs have resulted in lower water usage and lower overall water servicing and operating costs.

- ◆ **Challenge:** Water conservation programs are most effective for residential users.
- ◆ **Challenge:** Water conservation programs are public behavior driven and will take time, effort and commitment to succeed.
- ◆ **Challenge:** Some municipalities are further along with implementation of water conservation strategies than others.
- ◆ **Opportunity:** Municipalities and utilities that have developed water conservation strategies have information that will minimize the effort required to develop a strategy.
- ◆ **Opportunity:** Work completed by Spruce Grove to date could easily be expanded to include Stony Plain and Parkland County.
- ◆ **Benefit:** Reduced future capital costs and annual operating costs.

■ Recommended as a developmental action item.

7.4 Wastewater

7.4.1 Introduction

Similar to water, the three municipalities rely on a wastewater commission for transmission and treatment services (excludes large portion of Parkland County that utilizes lagoons and septic tanks). The primary difference is that the Alberta Capital Region Wastewater Commission (ACRWC) is made up of 13 member municipalities, and thus the municipalities only represent three of the 13 members. The ACRWC is responsible for planning, design, and construction of upgrades to the Parkland Sanitary Transmission System, which connects to the existing municipal wastewater trunks and conveys wastewater to the downstream ACRWC trunks and treatment plant. There is currently good cooperation among the three municipalities and the ACRWC. For example, the ACRWC is currently upgrading ACRWC transmission system through Spruce Grove and Parkland County, including development of wet weather storage facility at former Spruce Grove Lagoon in Parkland County. It is understood that the three municipalities have a working group to liaise with the ACRWC. The above strategies are working well and should continue.

7.4.2 Conduct Joint Wastewater System Planning

Municipalities currently conduct wastewater master plans based on growth needs and focuses on the individual municipality. The master plans require budget approval, and the timing varies by municipality.

- ◆ **Challenge:** Joint planning would reduce flexibility for individual municipalities.
- ◆ **Opportunity:** Easy and cost effective to initiate joint planning through inter-municipal collaboration. Conducting wastewater master plans for larger area is more cost effective.
- ◆ **Benefit:** Established wastewater servicing boundaries based on topography and not municipal boundaries. Minimizes servicing and operation and maintenance costs.

■ Recommended as a foundational action item.

7.4.3 Provide Utility Right-of-Way to Adjacent Municipalities for Cost Effective Servicing

Municipal boundaries can be a constraint to cost effective servicing if roadblocks are put up that block sewer installation from adjacent municipalities. The most cost-effective servicing follows natural topography.

- ◆ **Challenge:** Municipalities do not have the authority to construct municipal infrastructure within another municipality's boundaries. This leads to inefficient servicing if municipalities are competing for development.
- ◆ **Opportunity:** The Tri-Municipal Region has already decided to work cooperatively.
- ◆ **Benefit:** More cost-effective servicing, lower front-end costs for development. An example of this is described in Section 9.2.3.

■ Recommended as a foundational action item.

7.4.4 Consider Shared Wastewater Infrastructure

There may be some limited opportunities for sharing local wastewater collection systems between adjacent municipalities. Wastewater collection systems are planned based on topographic constraints similar to a stormwater drainage basin. In some cases, it may make sense for one municipality to provide servicing to an adjacent municipality where dictated by topography.

- ◆ **Challenge:** Shared ownership requires a formal agreement, and the benefit may not justify the effort needed to set up the agreement.
- ◆ **Challenge:** A long-term joint use agreement would need to be set up between the partnering municipalities.
- ◆ **Opportunity:** Can be considered on a case-by-case basis.
- ◆ **Benefit:** Reduced servicing costs.

■ Recommended as a foundational action item.

7.5 Stormwater

There are several potential stormwater drainage strategies that could be developed as part of a regional plan. Some of these may have positive impacts on one municipality while possibly have negative impacts on other municipalities. Some strategies could result in a net positive impact on all municipalities. The following strategies should be considered when viewed through the lens of the region acting as a single municipality:

7.5.1 Conduct Joint Stormwater System Planning

Municipalities currently conduct stormwater master plans based on growth needs and focuses on the individual municipality. The master plans require budget approval, and the timing varies by municipality.

- ◆ **Challenge:** Joint planning would reduce flexibility for individual municipalities.
- ◆ **Opportunity:** Easy and cost effective to initiate joint planning through inter-municipal collaboration. Conducting stormwater master plans for larger area is more cost effective.
- ◆ **Benefit:** Pre-development drainage patterns would be established with common basin and sub-basin boundaries.
- ◆ **Benefit:** Proposed storm infrastructure such as major trunks and drainage channels would be planned based on optimizing servicing of the entire upstream drainage basin, recognizing environmental reserves and depth constraints when servicing low lying areas. This also has the potential to reduce the loss of developable lands to stormwater management facilities, subject to topographic constraints.
- ◆ **Benefit:** Minimizes servicing and operation and maintenance costs.

■ Recommended as a foundational action item.

7.5.2 Consider Shared Stormwater Infrastructure

There may be some limited opportunities for sharing stormwater collection systems between adjacent municipalities. Stormwater collection systems are planned based on topographic constraints. In some cases, it may make sense for one municipality to provide servicing to an adjacent municipality where dictated by topography.

- ◆ **Challenge:** Shared ownership requires a formal agreement, and the benefit may not justify the effort needed to set up the agreement.
- ◆ **Challenge:** A long-term joint use agreement would need to be set up between the partnering municipalities.
- ◆ **Opportunity:** Can be considered on a case-by-case basis.
- ◆ **Benefit:** Reduced servicing costs.
- ◆ **Benefit:** Reduced operation and maintenance costs, especially if a lift station can be avoided.
- ◆ **Benefit:** Would result in a fully developed "end-to-end" system.

■ Recommended as a foundational action item.

7.5.3 Develop Joint “Low Impact Development” (LID) Strategy

LID incorporates storm drainage components that retains stormwater on site, mimicking the natural hydrologic cycle. It minimizes the environmental impact of development on downstream stormwater drainage systems, and thereby protects riparian health, receiving stream and wetlands’ water quality.

- ◆ **Challenge:** Initial servicing costs can be higher.
- ◆ **Opportunity:** EPCOR is a strong proponent for LID and has developed design standards and demonstration projects that will minimize the effort required to develop a strategy.
- ◆ **Benefit:** Reduced annual downstream runoff volume which benefits neighbouring municipalities.

■ Recommended as a developmental action item.

7.6 Transportation

7.6.1 Leverage Access to Highway 16 A

Collaborate with the Province to downgrade the classification of Highway 16 A. Highway 16A is currently classified as a multi-lane highway, specifically an urban divided expressway, with access limited to 1,600 m spacing or public roadway connections. Reducing the access spacing requirements improves developability for adjacent land uses, especially highway commercial.

- ◆ **Challenge:** Alberta Transportation currently owns and governs control of the corridor, except through the City of Spruce Grove, and need to agree to the change.
- ◆ **Challenge:** Increasing accesses along the corridor reduces the overall mobility due to increasing the number of turning vehicles and signalized intersections, which reduces travel speed and increases commute times.

- ◆ **Opportunity:** Protect parallel routes including Highway 628, 627 and Highway 16, to provide an alternative connection for travelling through the area.
- ◆ **Opportunity:** Increase the number of north/south connections from the tri-municipal growth areas to the parallel routes to promote the use of an alternative parallel connection.
- ◆ **Benefits:** Increased access to Highway 16 A increases the feasibility and attractiveness for investors developing the future growth areas.
- ◆ **Benefits:** Increasing access points increases the overall connectivity of the transportation network by providing more points for crossing the highway, reducing backtracking and improving overall mobility.
- ◆ **Benefits:** Increases the distribution of traffic demand across the transportation network, providing increase network redundancy, providing additional routes for vehicles in cases of congestion, construction, emergencies and other events. Better distribution of transportation demand across the network minimizes the need to build larger/oversized intersections and roadway connections.

■ **Recommended as a foundational action item.**

7.6.2 Increase the Number of Accesses on Highway 16

Collaborate with the province to increase the number of accesses from adjacent land uses to Highway 16, based on one-mile interchange spacing. Potential locations for new accesses are between Highway 44 and Century Road, between Highway 60 and Winterburn Road (City of Edmonton) and additional locations west of Highway 779.

- ◆ **Challenge:** Highway 16 is designated as a freeway, with the highest level of access management, with access only permitted at interchanges. Normally interchange spacing is a minimum of 3,200 m and the spacing between Highway 60 and Winterburn Road interchanges is 4,900 m, therefore a new interchange would be within approximately 2,400 m spacing.
- ◆ **Challenge:** A new interchange requires significant changes to the existing and future land use plans (some areas developed) and significant changes to existing and future transportation networks.
- ◆ **Challenge:** Costs to construct a new interchange likely exceed the \$10 – \$20 M range and is likely cost prohibitive, without other sources of funding (provincial and federal).
- ◆ **Challenge:** Does not provide a significant amount of benefit to other growth areas outside Acheson.
- ◆ **Benefits:** Significantly improves access to/from the Acheson industrial park.
- ◆ **Benefits:** Provides alternative access, where other accesses may be closed.

■ **Recommendation as a development action item.**

7.6.3 Provide Active Transportation Infrastructure at Provincial Highways

Where there are accesses and crossings to provincial highways, ensure they include infrastructure for active transportation and connect well into a localized active transportation system. This may be supported by regional active transportation network that connects between destinations across the subject area, leveraging crossing opportunities of major roadways and rail, wherever possible.

- ◆ **Challenge:** Retrofitting existing infrastructure to accommodate trails and cycle paths.
- ◆ **Challenge:** Collaborating with Alberta Transportation to allow new connections that minimize conflicts with future intersection widening or improvements plans.
- ◆ **Challenge:** Maintenance requirements (repair/replace, snow removal) may fall on the local municipalities.
- ◆ **Benefits:** Promotes active transportation by ensuring a more connected network, which resolves barriers. Aligns with planning policies published by all three municipalities to create a transportation network supporting all modes of transportation.

■ **Recommended as a foundational action item.**

7.6.4 Plan New East/West Roadway Connections, Between Municipalities

Extend existing east/west arterial roadways or create new east/west arterial connections that cross existing borders, resulting in a network that is separate from and relies less on the provincial highway system. A transportation network that continues to rely on the highway system will act as a barrier for transit and active transportation networks due to longer travel times, backtracking, less direct connectivity, limited number of highway crossings, and limited opportunity for expanded active modes infrastructure.

- ◆ **Challenge:** Confirming appropriate arterial alignments. Some potential arterial alignments would traverse or come near to environmentally sensitive areas such as the Wagner Natural Area.
- ◆ **Challenge:** The arterials would span several kilometers of land resulting in high costs for land acquisition and construction costs and their benefit may need further study.
- ◆ **Challenge:** May cause concern in terms of increased commercial/industrial traffic through the residential areas of the municipalities.
- ◆ **Benefits:** The Tri Municipal Region Labour Market Profile from December 2017 found that the 63 percent of the region's available jobs were filled by locals, totaling 15,100 jobs. Of this, 6,455 work in Spruce Grove, 3,555 work in Stony Plain, and 4,690 work in Parkland County. This indicates a significant amount of cross municipal traffic, which currently relies on the Highway network as there are no intermunicipal arterial connections.
- ◆ **Benefits:** Additional east west arterials reduce the Region's dependency on the provincial Highway Network and provide additional opportunities for accesses. The Acheson Big Lakes TIA included three east west arterials, all of which are included in the Ultimate Scenario (2047). The traffic analysis found that Highway 16A is anticipated to be over capacity and recommended the 92 Avenue arterial from Stony Plain to Edmonton to address the lack of capacity in the long-term scenario (2037).

- ◆ **Benefits:** Creating east west arterial roadway connections within the Tri-Regional area has the potential to significantly reduce the travel distance and time for commuting workers within the study area and is correlated to less costs and lower emissions for commuters.
- ◆ **Benefits:** Provides a direct connection (non-highway connection) between Stony Plain, Spruce Grove and Acheson for transit.

■ **Recommended as a developmental action item.**

7.6.5 Mixed Land Use and a Tighter Transportation Grid

Provide a mix of land use types that provides opportunities for residential, employment, recreational, retail and institutional within a smaller area combined with a tighter transportation grid to expand people's opportunities to access different types of transportation modes. Where multiple land uses cannot be integrated, provide direct connections between land uses, which accommodate all transportation modes.

- ◆ **Challenge:** Not currently reflected with the current approach to land use planning within the Region, as generally the land uses are segmented.
- ◆ **Benefits:** Increases the efficiency of the roadway network to move more people in a smaller area, reducing the cost for transportation infrastructure.
- ◆ **Benefits:** Allows for shorter distances between destinations, providing people more transportation options, including walking or cycling modes and will lead to lower vehicle transportation demands.

■ **Recommended as a foundational action item.**

7.6.6 Active Transportation Redundancy

Create an active transportation system that mimics the redundancy of the roadway network, providing access to alternative transportation infrastructure at a similar density level as roadways. Active transportation connections include sidewalks, trails, multi-use paths and dedicated cycling infrastructure as a means of providing a recreational and commuter network.

- ◆ **Challenges:** Many existing gaps in the active transportation network that need to be filled to support new connections made in new growth areas.
- ◆ **Challenges:** May be challenging from an investment perspective due a historical/traditional focus on building vehicle-oriented infrastructure only.
- ◆ **Benefits:** This would provide increased and more direct access for more users, allowing more people to choose an active transportation mode of travel reducing the impacts of new growth on the vehicular transportation network.

■ **Recommended as a developmental action item.**

7.6.7 Active Transportation Links

Support the active transportation network further by providing active transportation links (trails, sidewalks and multiuse paths) connecting directly between destinations, at efficient alignments (angular to the road system), through and between development areas and between municipalities.

- ◆ **Challenges:** Retrofitting active transportation links into existing developments may be expensive as the cost may not be offset by development.
- ◆ **Benefits:** Connecting active transportation infrastructure to developments makes the mode more practical and accessible to the public, and could potentially reduce the demand on the roadway network.

■ **Recommended as a developmental action item.**

7.6.8 High Quality Active Transportation Crossings

Support the active transportation system at major roadway crossings by planning to provide high quality and attractive crossings that ensure the roadway network does not become a barrier to active transportation.

- ◆ **Challenges:** Crossings at AT intersections require approval from the Province and the Province generally prioritizes traffic/goods movement over active mode accommodations.
- ◆ **Challenges:** Ensuring new crossings are clearly marked and drivers are aware to look for pedestrians and cyclists.
- ◆ **Benefits:** Support walking and cycling as a viable commuting option by providing safe crossings, potentially reducing the demand on the roadway network.

■ **Recommended as a developmental action item.**

7.6.9 Integrated Park and Ride Services

Integrate park-and-ride services that connect with the regional transit system. Ensure the park-and-ride integrates well with the land use plan, allowing users to commute to the park-and-ride by vehicles, active transportation (walking and cycling) and transit.

- ◆ **Challenges:** Park-and-ride site selection requires thoughtful consideration which balances the need for integration with land use and avoiding the potential for creating parking issues.
- ◆ **Challenges:** Site specific parking management strategies may be needed, including residential parking programs, limited duration parking and increased parking enforcement.
- ◆ **Benefits:** Integrated park and ride services would provide the opportunity for the municipalities to pool their resources and reduce redundancy within their existing transit services, focusing on providing a quality and reliable transit hub. This could result in an increase in the transit mode share, reducing the demand on the Region's roadway system. Providing strong active mode connections to the park and ride would further support the shift towards other modes.

■ **Recommended as a foundational action item.**

7.6.10 Grade Separated Rail Crossing

Increase the number of grade-separated rail crossings within the plan area to reduce the impacts of rail crossing on mobility needs for all users of the transportation system.

- ◆ **Challenges:** Grade separated rail crossings are high cost, and will need to have a large benefit to the local or regional traffic in order to offset the expense.
- ◆ **Challenges:** Any plans would require collaboration and approval from CN.
- ◆ **Benefits:** Reducing delays associated with daily railway operations and increase safety by separating the trains from vehicles, pedestrians and cyclists.
- ◆ **Benefits:** Reduces stop delays reduces vehicle idling time and emissions generated.
- ◆ **Benefits:** Increased reliability for all modes of transportation, including more reliable transit route times and emergency vehicle response times.

■ Recommended as a foundational action item.

7.6.11 Leverage the Existing Rail System

Plan industrial uses to leverage the existing rail system and allow future rail spurs to connect to the rail system.

- ◆ **Challenges:** Integration and collaboration with CN.
- ◆ **Benefits:** Increasing the attractiveness of the developable land, if needed for industrial land uses.

■ Recommended as a developmental action item.

7.6.12 Leverage the Proposed New Over-Dimensional, Overweight Corridor

Leverage the newly proposed new over-dimensional, over-weight corridor connecting from Highway 19 north to Highway 44 and Highway 60 by connecting it to appropriate industrial and manufacturing land uses (and improve accessibility to Edmonton International Airport and potentially Villeneuve Airport).

- ◆ **Challenges:** The timeline for designating the proposed over-dimensional, over-weight corridor is unclear.
- ◆ **Challenges:** Requirements needed for supporting the route through 114 Avenue (though Acheson), including removal of vertical obstructions and providing large intersection geometries.
- ◆ **Benefits:** More efficient and economical potential for industrial land uses, making the adjacent lands more attractive for industrial development.

■ Recommended as a foundational action item.

7.7 Utilities

The key strategy relating to utilities for the municipalities is to increase Broadband coverage to the minimum CRTC service standards. The following strategies are steps along the way and should be complete in order.

7.7.1 Parkland County and Stony Plain to complete Broadband Study

First Parkland County and Stony Plain should complete a broadband study (coordinated or not) to provide a detailed assessment of the areas in need of broadband to CRTC standards in the Tri Municipal Region, including preliminary business case. It is understood that Parkland County has undertaken a broadband study, focusing on underserved areas, so the scope of work within the County could be limited. The study should also include recommendations, including order of magnitude costs, for investment to provide maximum benefit to the region with respect to broadband.

- ◆ **Challenges:** Minimal challenges anticipated
- ◆ **Benefits:** Increases economic potential for industrial and commercial land uses.

■ **Recommended as a foundational action item.**

7.7.2 Identify Sources of Funding for bringing Broadband to rural areas

Using the business case and costs determined in the study, the municipalities can then identify sources of funding. The CRTC expect targets will be met through a combination of the CRTC funding mechanism, private investments, other government funding, and public-private partnerships. The Canada Infrastructure Bank and Innovation, Science and Economic Development Canada (ISED) have agreed to collaborate to encourage and jointly assess and enable large broadband projects within ISED's Universal Broadband Fund.

- ◆ **Challenges:** Timely execution of the Broadband Study and funding review to ensure all available opportunities are explored and capitalised upon.
- ◆ **Benefits:** Reduces funding requirement for the municipalities to provide economic incentives to development.

■ **Recommended as a foundational action item.**

7.7.3 Assess Opportunities for and Implement Partnering and/or Incentivizing Provision of Broadband

Once funding is secured, the municipalities should assess opportunities for partnering and incentivizing establishment of broadband as a utility in areas currently unserved. This could be in the form of an RFP to industry. A pilot project could be conducted to demonstrate benefit and determine which of the following key considerations need to be prioritized:

1. Responsibilities for deployment and operation;
2. Operation of the network on a wholesale basis, with the network facilitating competition that:
 - a. ensures equivalence of price and non-price terms and conditions for all retail service providers;
 and

- b. permits such providers to differentiate their product offerings.
 - 3. Funding/payment mechanisms;
 - 4. Operating period;
 - 5. Ownership;
 - 6. Future upgrade plans;
 - 7. Rights of Way;
- ◆ **Challenges:** ensuring competition between broadband service providers
 - ◆ **Challenges:** determining preferred and most beneficial operating, maintenance and ownership strategy
 - ◆ **Benefits:** allows the provision of broadband for economic development with shared risk, cost and benefit between service providers and municipalities

■ **Recommended as a developmental action item.**

7.8 Action Items

The following action items are based on Sections 7.2 to 7.7, summarizing the detailed recommendations, external partners (other than tri-municipal partners), status (foundation, developmental or aspirational) and costs. Costs are summarized using a number of dollar signs based on the following range provided in the table below:

Table 7.1: Cost Estimates

Costs	
\$	\$100,000
\$\$	\$500,000
\$\$\$	\$2,500,000
\$\$\$\$	\$10,000,000
\$\$\$\$\$	\$50,000,000

Action	External Partners	Status	Cost
1. Harmonization of Off-site Levies The region can harmonize the off-site levy programs by using consistent criteria, documentation, etc. Integration of off-site levy programs has greater potential benefits but would require significant effort and should be explored as an aspirational goal.	Developers	Foundational	\$

Action	External Partners	Status	Cost
2. Development of Common Municipal Design Standards and Guidelines This can be accomplished entirely with in-house resources or through a combination of in-house staff and external consultants. It can be completed relatively quickly if adequate resources are assigned to it.	Consultant	Foundational	\$
3. Explore Shared Use of Engineering and Public Works Services Further study is needed to determine what in engineering and public works functions should be shared across the municipalities (this may have been address by other concurrent studies). On-going discussions are needed between municipal engineering and public works leaders to determine the potential efficiencies of sharing human and equipment resources across the Region.	None	Developmental	\$
4. Conduct Joint Water System Planning Joint planning can range from on-going staff to staff communication to integrating wastewater master plans across two or three municipalities. Can be initiated immediately at little to no cost.	None	Foundational	\$
5. Create Emergency Connections Between Water Distribution Systems Each municipality's distribution system would be hydraulically isolated, operating as separate systems with a valve that is opening only during emergency situations.	None	Developmental	\$
6. Consider Shared Water Infrastructure It may be feasible for Stony Plain and Parkland County to share water reservoir capacity in the medium to long term.	None	Aspirational	\$
7. Develop Joint Water Conservation Strategy Stony Plain and Parkland County can build on Spruce Grove's water conservation strategy to minimize future infrastructure investment.	None	Developmental	\$
8. Conduct Joint Wastewater System Planning Joint planning can range from on-going staff to staff communication to integrating wastewater master plans across two or three municipalities. Can be initiated immediately at little to no cost.	None	Foundational	\$

Action	External Partners	Status	Cost
9. Provide Utility Right-of-Way to Adjacent Municipalities for Cost Effective Servicing The portion of Parkland County's Fifth Meridian Business Park ASP area immediately north of Stony Plain can be serviced to the ACRWC Trunk most cost effectively by a sewer through the Town along Highway 779. The Town needs to provide a URW to the County to facilitate this. There may be similar opportunities between Spruce Grove and Stony Plain along their shared border.	None	Foundational	\$
10. Consider Shared Wastewater Infrastructure The most cost-effective way to service development along Highway 779 in Parkland County and Stony Plain is through a single sewer connecting to the ACRWC. This would require cost-sharing agreement between the parties.	None	Foundational	\$
11. Conduct Joint Stormwater System Planning Joint planning can range from on-going staff to staff communication to integrating wastewater master plans across two or three municipalities. Can be initiated immediately at little to no cost.	None	Foundational	\$
12. Consider Shared Stormwater Infrastructure There are two locations where it appears to be more cost effective to provide stormwater servicing for one municipality through an adjacent municipality: the portion of Parkland County's Fifth Meridian Business Park ASP area immediately north of Stony Plain along Highway 779 (County being serviced by Town), and along the Stony Plain / Spruce Grove border south of Highway 16A (Town being serviced by SG). This would require cost-sharing agreement between the parties.	None	Foundational	\$
13. Develop Joint "Low Impact Development" (LID) Strategy Strategy can be developed slowly with a nominal level of in-house resources (less than 0.1 FTE) to research efforts by EPCOR to date and consider which EPCOR standards to incorporate. Could also be achieved through external consultants with an initial cost in the order of \$20k to \$50k. Some staff resources will be need amongst the municipalities to select specific LID components to implement in the Region.	None	Developmental	\$

Action	External Partners	Status	Cost
14. Leverage Access to Highway 16 A Pursue lowering the access regulations of Highway 16 A to meet the needs for supporting future growth, including allowing direct access to development. To mitigate the impacts of increasing access points, create a tri-municipal regional working group in partnership with Alberta Transportation, with a focus on reducing travel time through the corridor by co-planning improvement projects and managing traffic signals. To reduce through traffic volumes on Highway 16A impacted by increased travel times, increase the number of north/south connections to alternative east/west corridors, including Highway 628.	Alberta Transportation	Foundational	\$
15. Active Transportation Infrastructure at Provincial Highways Coordinate with Alberta Transportation to provide high quality active transportation infrastructure to connect well into a localized active transportation system. This may be supported by regional active transportation network that connects between destinations across the subject area, leveraging crossing opportunities of major roadways and rail, wherever possible. This strategy may be implemented slowly and be integrated into future highway improvement projects.	Alberta Transportation	Foundational	\$
16. Plan New East/West Roadway Connections, Between Municipalities This is intended to reduce the municipalities' reliance on the provincial highway system as well as alleviate congestion on existing east-west connections. The scope of projects within this strategy vary. Short connections between Spruce Grove and Stony Plain are considered more achievable and thus developmental, while longer connections between Spruce Grove and Acheson are more challenging thus considered aspirational.	Alberta Transportation	Developmental	\$\$\$\$ - \$\$\$\$\$
17. Mixed Land Use and a Tighter Transportation Grid This strategy can be easily incorporated to future land use plans within the study area at no extra cost. Developing areas with a mixed land use and tighter transportation grid increases the efficiency of the roadway network to move more people in a smaller area, reducing the cost for transportation infrastructure.	None	Foundational	n/a
18. Active Transportation Redundancy This strategy is most challenging in retro-fit scenarios, as active transportation infrastructure could be made a requirement for future development at minimal cost to the municipality. Creating redundancy in the active transportation grid makes the network more reliable, direct, and attractive for users, potentially leading to a higher active transportation mode split, lowering the demand and potentially reducing the need for roadway capacity improvements.	None	Developmental	\$\$\$

Action	External Partners	Status	Cost
19. Active Transportation Links This strategy is most challenging in retro-fit scenarios, where the cost is not likely to be offset by development. Quality active transportation links to destinations will support an increased shift to active transportation modes potentially lessening the strain on the roadway network.	None	Developmental	\$\$
20. High Quality Active Transportation Crossings This strategy will require cooperation with Alberta Transportation and may be challenging as the priority on highways is typically vehicles and goods movement. Active transportation crossings may be integrated into infrastructure improvement projects.	Alberta Transportation	Developmental	\$\$
21. Integrated Park and Ride Services A regional park and ride service is integral to increasing the transit mode share and increasing transit viability in the study area, thus reducing the demand on the roadway network.	Regional Transit Serviced Commission	Foundational	\$\$
22. Grade Separated Rail Crossing While grade separated crossings are costly and difficult to coordinate, separating rail from traffic increases safety and reduces delays caused by trains.	CN Alberta Transportation	Foundational	\$\$\$\$ - \$\$\$\$\$
23. Leverage Existing Rail System Connect industrial land use to rail through future rail spurs as needed.	CN Alberta Transportation	Developmental	\$\$
24. Leverage Proposed New Over-dimensional, Overweight Corridor More efficient and economical potential for industrial land uses, making the adjacent lands more attractive for industrial development.	Alberta Transportation	Foundational	\$\$
25. Parkland County and Stony Plain to complete Broadband Study	Broadband Subconsultant	Foundational	\$
26. Identify Sources of Funding for bringing Broadband to rural areas	Canada Infrastructure Bank. Innovation, Science and Economic Development Canada (ISED)	Foundational	\$

Action	External Partners	Status	Cost
27. Assess Opportunities for and Implement Partnering and/or Incentivising Provision of Broadband	Canada Infrastructure Bank Innovation, Science and Economic Development Canada (ISED) Broadband Service Providers	Developmental	\$\$

7.9 Prioritization

Prioritization of action items focuses on those providing the greatest value, satisfying the highest level of need and considered achievable in a relative short period of time. Four action items are listed as the top priorities for pursuing, with some of these being integration of the above individual action items. The highest priorities are:

- ◆ **Priority #1:** Completing joint planning studies for water, wastewater, stormwater, and transportation for the purposes of identifying items for improved collaboration, projects which may have a shared benefit and shared costs and other areas that through partnership will improve overall efficiency in the Tri-municipal region and reduce costs.
- ◆ **Priority #2:** Pursuing declassification of Highway 16A to allowed for increased access to support future adjacent development and potentially have the governance of Highway 16A transferred from the province to the Tri-municipal region. Benefits include allowing the Tri-municipal region to manage the corridor for the purposes of managing transportation needs for servicing the preferred land use plan.
- ◆ **Priority #3:** Complete broadband studies, identify sources of funding, and implement partnering and/or incentivising provision of broadband.
- ◆ **Priority #4:** Pursuing an active transportation connection along Highway 16A, between Stony Plain and Spruce Grove, supporting both municipalities aspirations for improving active transportation modes and connecting to existing active transportation systems in both municipalities.

8.0 DETAILED WATER SERVICING PLAN

8.1 Introduction

This section of the report describes the detailed water servicing plan in relation to the Preferred Land Use Plan and the staging of any upgrades needed. The principles of the high level strategies were considered but not necessarily incorporated. The detailed water servicing plan focuses on servicing the three municipalities by utilizing servicing plans from the following documents:

- ◆ Town of Stony Plain Water and Sanitary Master Plan Update, March 2019,
- ◆ City of Spruce Grove Water Master Plan Update, May 2015, and
- ◆ Acheson and Big Lake Area Water Servicing Study, September 2016.

8.2 Reservoirs

8.2.1 Existing Reservoirs

The analysis of reservoir storage and pumping capacity is presented within this section. **Table 8.1** summarizes the existing storage and pumping capacity at each of the reservoirs. The distribution pumping capacity is based on having at least one distribution pump on standby.

Table 8.1: Existing Water Reservoir Storage and Pumping Capacity

Municipality	Reservoir / Pumphouse	Existing Storage (m ³)	Existing Distribution Pumping Capacity (L/s)	Existing Fire Flow Pumping Capacity (L/s)
Stony Plain	Meridian Heights	14,630	140	227
	High Park	4,545	82	190
	Total	19,175	222	417
Spruce Grove	Zone 1	42,500	344	300
	Zone 2	8,619	126	207
	Total	51,119	470	507
Acheson	Zone 3	4,334	240	-
	Zone 4	8,758	105	-

Based on the land use plan, industrial and/or commercial development is anticipated in all three municipalities which calls for the highest level of service in terms of fire flows. **Table 2.2** shows the fire flow requirements for each municipality which are summarized below:

- ◆ 300 L/s within Spruce Grove,
- ◆ 233 L/s within Stony Plain, and
- ◆ 230 L/s within Parkland County.

Requirements for storage capacity for the three municipalities are summarized below:

- ◆ Stony Plain reservoir storage capacity shall be maximum day demands (two times ADD) plus fire flow storage and 1,600 m³ of estimated truck fill.

- ◆ Parkland County reservoir storage requirements are based on maximum day demands (two times ADD) plus fire storage.
- ◆ Spruce Grove reservoir storage requirements are based on maximum day demands (two times ADD) plus fire storage.

Fire storage requirements are set out in the Fire Underwriter's Survey, 1999.

8.2.2 Future Storage Requirements

Based on the above information, **Table 8.2** summarizes the storage capacity requirements for each municipality.

Table 8.2: Municipality Storage Requirements

Municipality		Storage (m ³)				
		2020	2030	2040	2050	2060
Stony Plain	Existing	19,175	19,175	19,175	19,175	19,175
	Required	14,328	15,056	16,206	17,267	19,907
	Additional Needed	-	-	-	-	732
Spruce Grove	Existing	51,119	51,119	51,119	51,119	51,119
	Required	27,164	29,040	31,152	33,265	34,093
	Additional Needed	-	-	-	-	-
Acheson / Big Lake	Existing	13,092	13,092	13,092	13,092	13,092
	Required	5,612	15,729	23,489	32,326	35,816
	Additional Needed	-	2,637	10,397	19,234	22,724
Parkland Fifth Meridian ASP	Existing	-	-	-	-	-
	Required	-	-	-	5,725	6,512
	Additional Needed	-	-	-	5,725	6,512

Below is a summary regarding the storage capacity within the municipalities:

- ◆ Stony Plain will require 732 m³ of additional storage by the 2050/60 scenario which will be constructed as part of the proposed West Reservoir. The 2019 Stony Plain Water and Wastewater Master Plan recommended an ultimate West Reservoir storage capacity of at least 10,000 m³ based on the ultimate West Pressure Zone storage requirements. It is recommended that the West Reservoir and Pumphouse be constructed with a minimum of 5,000 m³ to accommodate future storage requirements and have cost effective construction.
- ◆ The Spruce Grove Zone-1 Reservoir and Pumphouse was recently upgraded in the last two years to provide sufficient storage for up to 75,000 residents. Based on the storage requirement calculations, Spruce Grove does not require any storage upgrades.
- ◆ Acheson requires additional storage as early as 2030 and the following is proposed:
 - ◆ Add 2,637 m³ of reservoir storage to the Zone 4 Reservoir in the 2020/30 scenario,
 - ◆ Construct the proposed 7,760 m³ West Acheson Reservoir in the 2030/40 scenario,

- ◆ Add 8,837 m³ of reservoir storage to the Zone 4 Reservoir in the 2040/50 scenario, and
- ◆ Add 3,490 m³ of reservoir storage to the Zone 4 Reservoir in the 2050/60 scenario.
- ◆ There is approximately 320 ha of land north of Stony Plain within Parkland County that is proposed to be developed in the 2040/50 and 2050/60 scenarios and this area is referred to as Fifth Meridian ASP. This will require a new reservoir serviced off the WILD Transmission Main, which is referred to as the Proposed North Reservoir. The total storage calculation showed that Fifth Meridian West requires approximately 6,512 m³ which is assumed to be constructed all at once in the 2040/50 growth scenario. There are opportunities to utilize shared reservoir storage as discussed in Section 8.2.3 below in order to minimize the number of reservoirs needed.

The servicing plan below includes figures that show locations of proposed reservoirs and existing reservoir expansions for each of the growth scenarios.

8.2.3 Shared Storage Reservoirs

Table 8.2 shows that Stony Plain and Parkland County (Meridian) will need to construct or expand storage reservoirs between 2040 and 2050. These reservoirs are typically constructed with 5,000 m³ to 10,000 m³ of storage capacity at a cost of \$5M to \$10M or more. It does not make sense for the Region to construct three reservoirs at approximately the same time when only one (or perhaps two) would provide the needed storage requirements. As outlined in Section 7.3.3, sharing water infrastructure comes with challenges and the cost savings need to be weighed against the logistical challenges associated with shared infrastructure. Financing a \$5M to \$10M reservoir 10 or 20 years earlier with separate system may be preferable to the logistical expenditures associated with a shared infrastructure scenario.

The servicing plan recognizes operating challenges associated with shared storage and is based on each municipality constructing storage to meet its own storage requirements.

8.2.4 Reservoir Pumping Requirements

Reservoir pumping capacity requirements are summarized in **Table 8.3** for comparison purposes. Existing pumping capacity shown is the sum of all available distribution and fire pumps within the municipality, based on the assumption that at least one distribution pump is available on standby. In the short term, no significant pumping upgrades are required. It should be noted that pumping upgrades are considered a small cost item relative to the cost of new reservoirs and/or expansions.

Table 8.3: Reservoir Pumping Capacity Requirements

Municipality		Pumping Capacity (L/s)				
		2020	2030	2040	2050	2060
Stony Plain	Existing	639	639	639	639	639
	Required	351	360	373	385	416
	Additional Needed	-	-	-	-	-

Municipality		Pumping Capacity (L/s)				
		2020	2030	2040	2050	2060
Spruce Grove	Existing	977	977	977	977	977
	Required	564	586	611	635	645
	Additional Needed	-	-	-	-	-
Acheson / Big Lake	Existing	345	345	345	345	345
	Required	266	383	473	575	616
	Additional Needed	-	38	128	230	271
Parkland Fifth Meridian ASP	Existing	-	-	-	-	-
	Required	-	-	-	246	255
	Additional Needed	-	-	-	246	255

8.3 Distribution System Servicing Plan

The overall water servicing plan is shown for the entire Tri-Municipal Area on **Figures 8.1** through **8.4** for the 10-year (2020/30), 20-year (2030/40), 30-year (2040/50), and 40-year (2050/60) growth horizons, respectively. More details regarding specific upgrades are summarized in their respective sections.

8.3.1 Spruce Grove

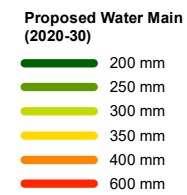
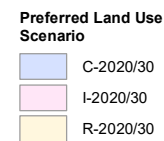
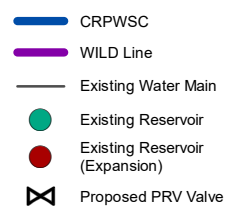
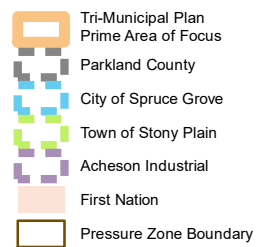
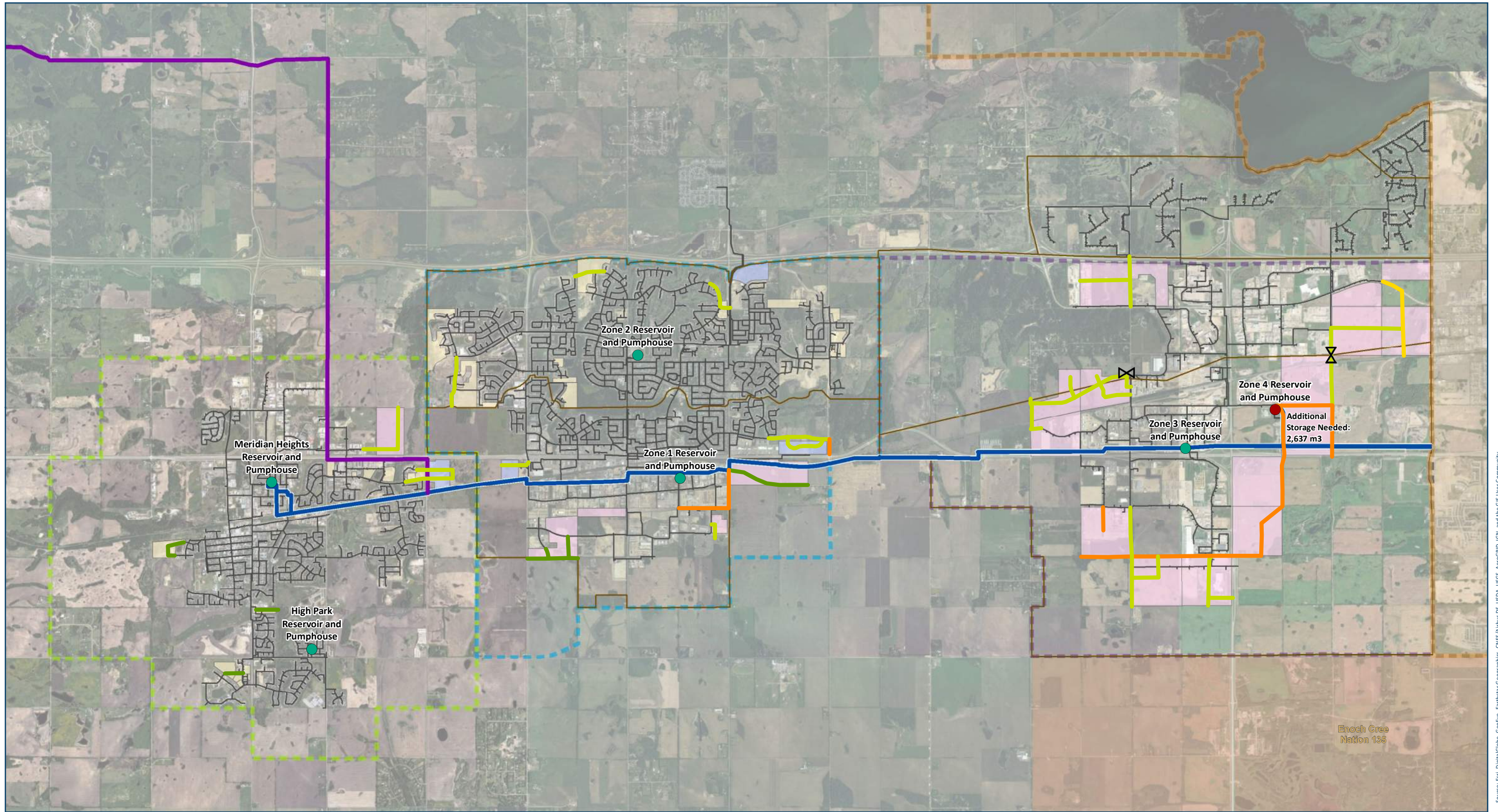
The overall servicing plan for Spruce Grove is shown on **Figures 8.1** through **8.4** and key details are summarized below.

The 10-year growth horizon from 2020 through 2030 features additional 300 mm looping at several locations within the residential growth areas and a 400 mm connection from the existing network in the Spruce Grove industrial area east and north to the proposed 250 mm main servicing the industrial / commercial areas south of Highway 16A and east of Century Road.

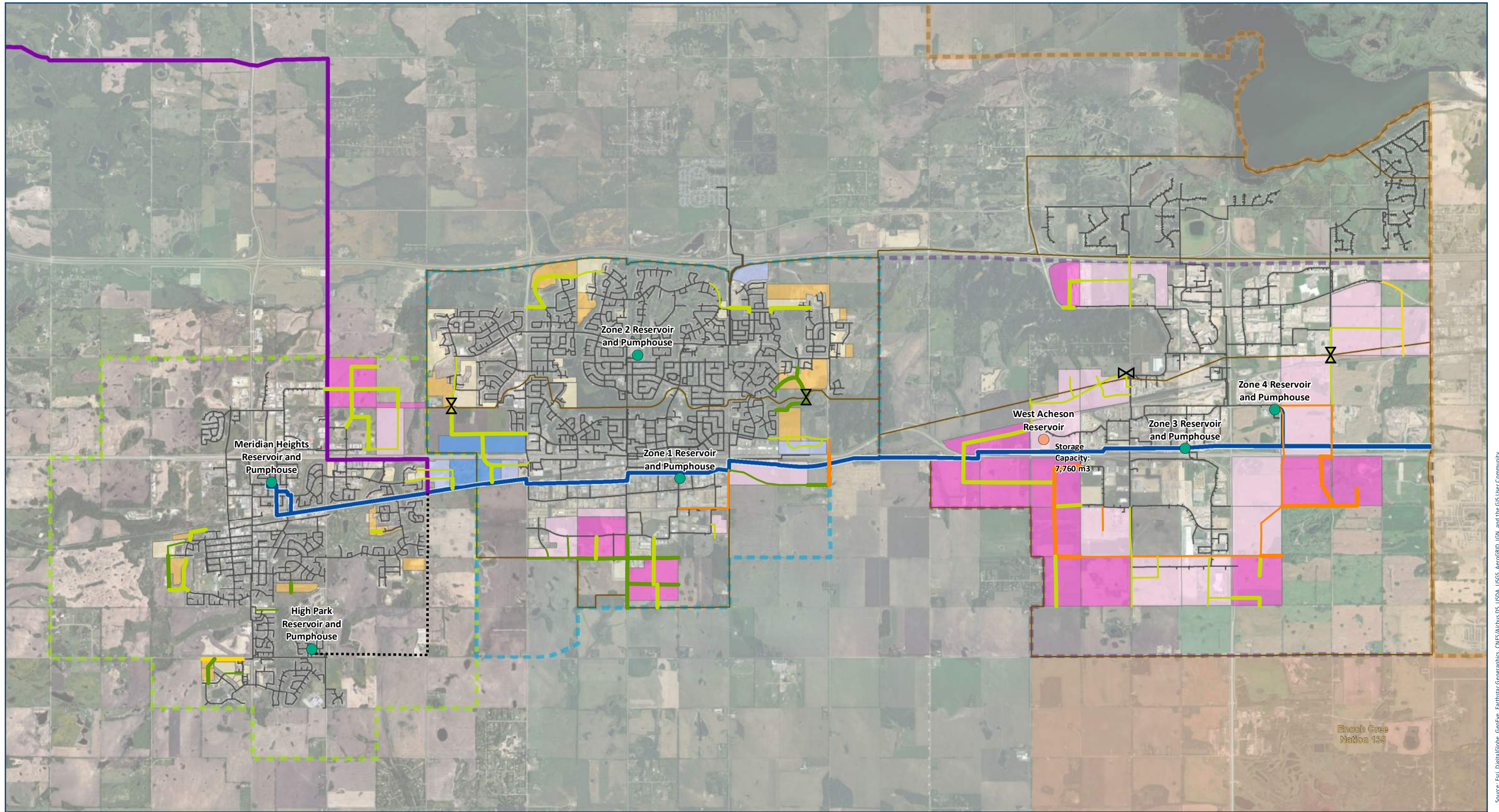
During the 20-year growth horizon, looping between Zone 1 and Zone 2 is proposed using pressure reducing valves along the pressure zone boundary where necessary. To the south, the industrial network is expanded using 250 and 300 mm mains and there is a 400 mm connection across Highway 16A along the east edge of the City.

The 30-year growth horizon features expansion of the proposed networks further into the growth areas and 5,000 m³ constructed at the Zone 1 Reservoir to meet the additional 1,646 m³ storage required. It was assumed that the Zone 1 Reservoir would be upgraded since it is filled directly from the CRPWSC, services both pressure zones, and fills the Zone 2 Reservoir.

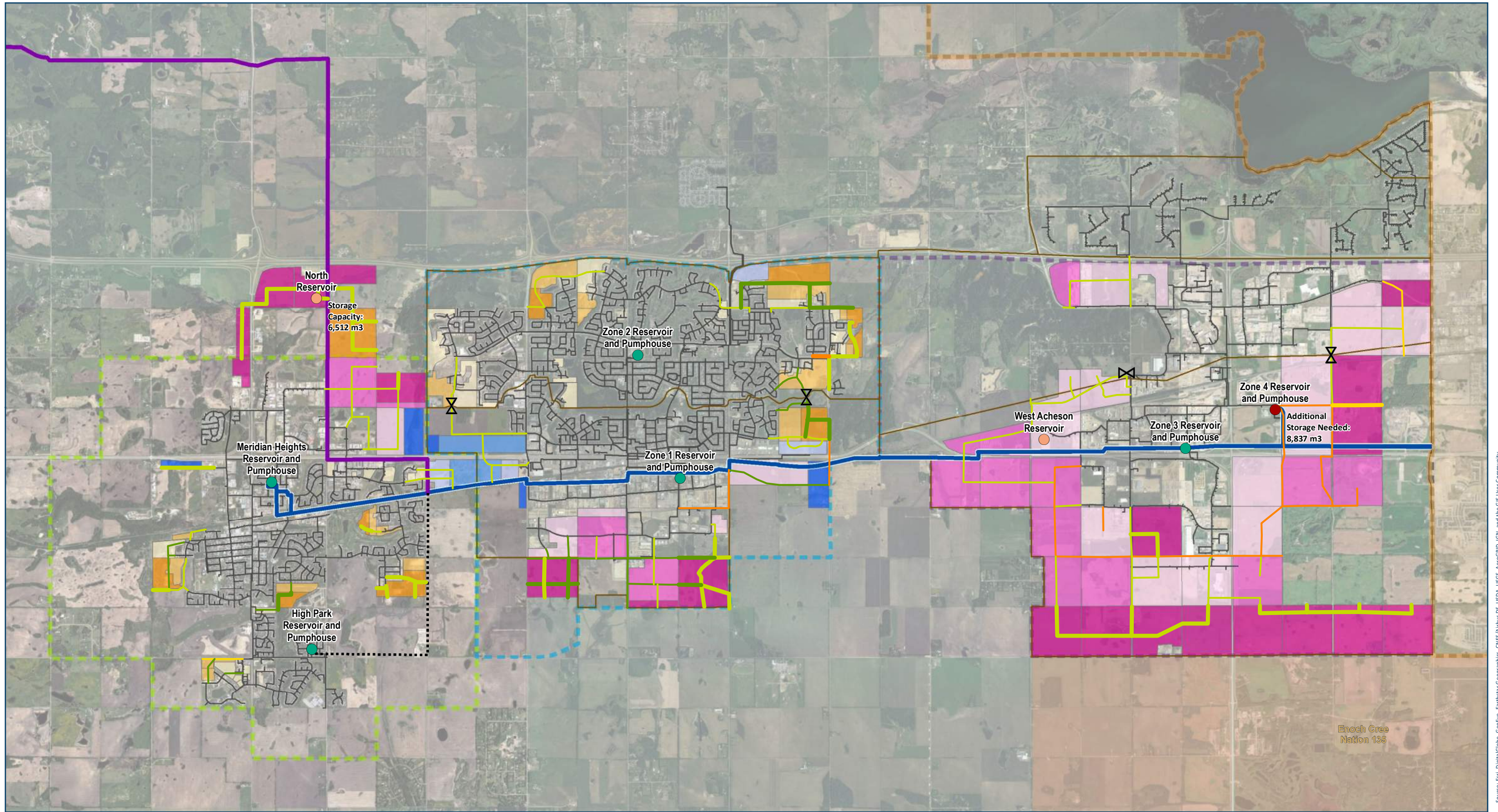
The additional 829 m³ of storage required at the Zone 1 Reservoir for the 40-year growth horizon is included as part of the 5,000 m³ storage constructed in the 30-year growth horizon.



TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY
FIGURE 8.1
WATER SERVICING PLAN
10-YEAR GROWTH (2020-30)



Document: \\edms02\GIS\15739_Traffic_Uilities_and_Infra_Strategy\02_CADD\25_GIS\25_L_Figures\15739_Land_Use_Plan_Water_210325.mxd
Date: 2024-03-25



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



0 0.5 1 2 3 4 km
Coordinate System: CANA83-3TM114



- Tri-Municipal Plan Prime Area of Focus
- Parkland County
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial
- First Nation
- Pressure Zone Boundary

- CRPWSC
- WILD Line
- Existing Water Main
- Dedicated Feed Line to High Park Reservoir
- Existing Reservoir
- Existing Reservoir (Expansion); Additional Storage Needed: 5,000 m3
- Proposed Reservoir

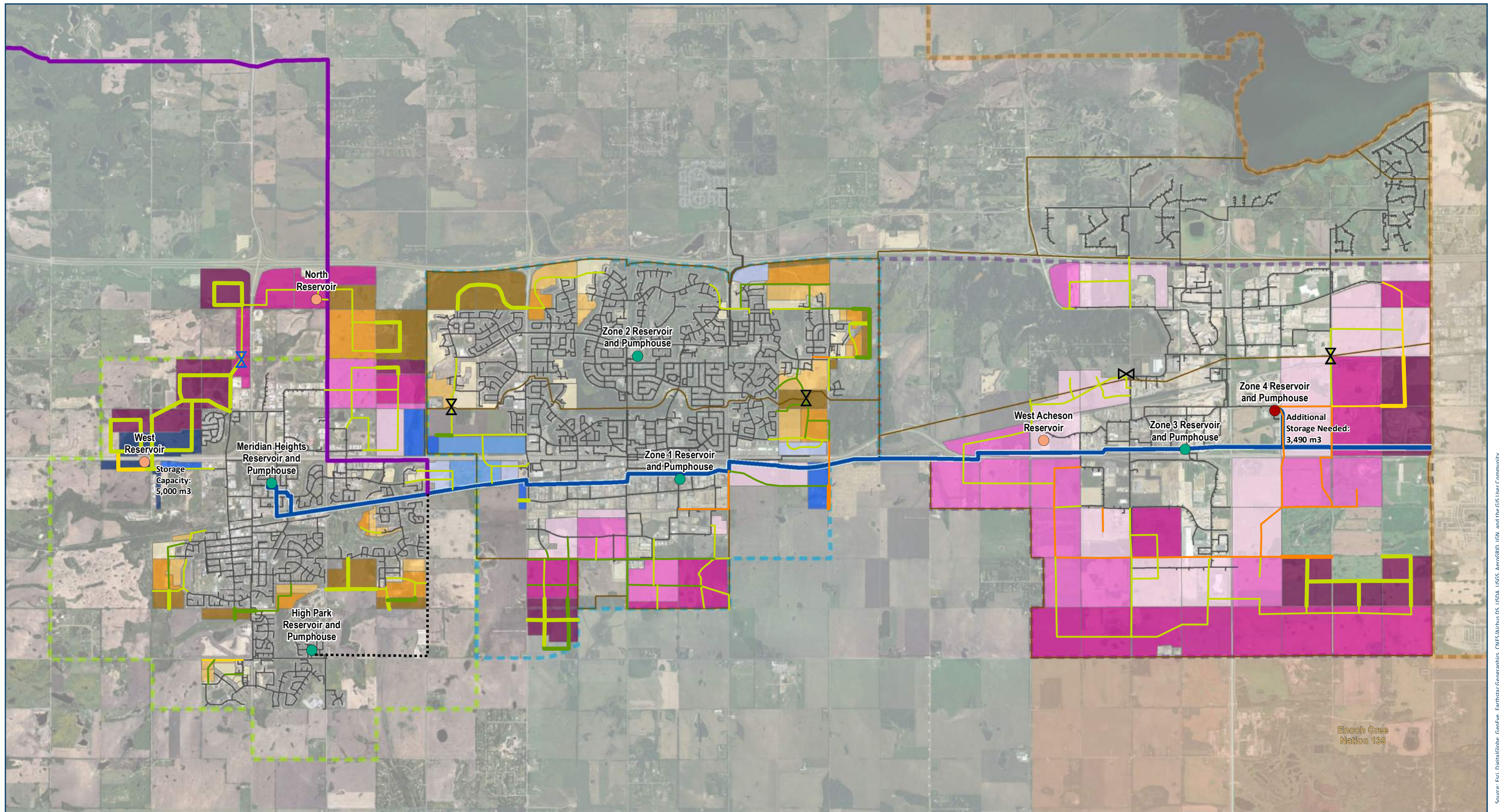
- Proposed PRV Valve
- Preferred Land Use Scenario
- C-2020/30
- C-2030/40
- C-2040/50

- I-2020/30
- I-2030/40
- I-2040/50
- R-2020/30
- R-2030/40
- R-2040/50

- Proposed Water Main (2040-50)
- 200 mm
- 250 mm
- 300 mm
- 350 mm
- 400 mm
- 600 mm

- Previously Proposed Water Main
- 200 mm
- 250 mm
- 300 mm
- 350 mm
- 400 mm
- 600 mm

TRI-MUNICIPAL TRANSPORTATION, UTILITIES AND INFRASTRUCTURE STRATEGY
FIGURE 8.3
WATER SERVICING PLAN
30-YEAR GROWTH (2040-50)



8.3.2 Stony Plain

The overall servicing plan for Stony Plain is shown on **Figures 8.1** through **8.4**.

The 10-year growth scenario includes 250 mm loops in southern Stony Plain, a 300 mm loop into proposed Highway 16 industrial area, and an extension of 300 mm north of Highway 16A, whose looping will be completed by the 20-year scenario.

The 20-year growth scenario continues to expand as shown and a dedicated feed line is proposed to connect the High Park Reservoir directly to the CRPWSC. The High Park Reservoir services approximately one third of Stony Plain and based on 2060 demands, assuming the peak fill rate is similar to MDD, implies that this transmission main should be 300 mm in size to maintain acceptable velocities.

The 40-year growth scenario features the construction of the newly proposed West Reservoir with a storage volume of 5,000 m³. While only 732 m³ is required for the 40-year growth scenario, it is recommended that the reservoir be oversized to account for ultimate development within the future West Pressure Zone, beyond the 40-year growth boundaries. The Town of Stony Plain Water and Sanitary Master Plan Update (March 2019) recommends at least 10,000 m³ of West Reservoir storage capacity based on the ultimate servicing area which the West Reservoir can be expanded to in the future.

8.3.3 Parkland County – Fifth Meridian ASP

Water servicing of the Fifth Meridian ASP is shown on **Figures 8.3** and **8.4** since development is not projected until the 30-year scenario.

The 30-year growth scenario requires the proposed North Reservoir located southeast of the intersection between Highway 16 and Highway 779 with a storage capacity of 6,512 m³. The proposed North Reservoir would be connected to the WILD Transmission Main and would service the areas north of Stony Plain independently from Stony Plain. A connection between the Stony Plain and the Fifth Meridian ASP water networks is proposed using an isolation valve, providing additional redundancy to both water networks. This is addressed in Section 7.3.2 above.

If development pressures are strongest along Highway 779 initially, water servicing could be supplied to the County from Stony Plain's distribution system. This will require a servicing agreement between the municipalities, as discussed in Section 7.3.3.

8.3.4 Parkland County – Acheson / Big Lake

The overall servicing plan for Acheson / Big Lake is shown on **Figures 8.1** through **8.4**.

For the 10-year growth horizon, a 400 mm distribution main will extend from the Zone 4 Reservoir to the south which will form the basis of future expansion to the south. To accommodate the large amount of industrial growth within Acheson, the Zone 4 Reservoir will need a 2,637 m³ expansion in the first 10 years. Additional PRVs will be required along the pressure zone boundaries where looping crosses zones.

PRVs shown are schematic and their exact location and settings would be determined as part of future design projects.

In the 20-year scenario, the proposed West Acheson Reservoir will be constructed with a storage volume of 7,760 m³. This reservoir will assist in servicing the large amount of development to the south within Acheson. North of the proposed West Acheson Reservoir additional PRVs will be needed for any looping that extends across pressure zone boundaries.

The 30- and 40-year scenarios propose further 8,837 m³ and 3,490 m³ expansions to the Zone 4 Reservoir, respectively.

8.4 Water Servicing Cost Estimates

Water servicing costs are summarized in **Table 8.4** for each of the growth scenarios. The costs for reservoirs are shown as the product of incremental storage volumes required and typical storage unit prices. For more detailed water cost estimates, see **Appendix A**.

Table 8.4: Water Servicing Cost Summary

Water Costs		Costs (\$M)			
Municipality	Item	2020/30	2030/40	2040/50	2050/60
Stony Plain	Watermains	\$ 3.6	\$ 6.6	\$ 3.1	\$ 11.5
	Dedicated Feed	\$ -	\$ 4.3	\$ -	\$ -
	Reservoir	\$ -	\$ -	\$ -	\$ 5.4
	Total	\$ 3.6	\$ 11.0	\$ 3.1	\$ 16.8
Spruce Grove	Watermains	\$ 8.6	\$ 15.6	\$ 10.3	\$ 6.3
	Reservoir	\$ -	\$ -	\$ -	\$ -
	Total	\$ 8.6	\$ 15.6	\$ 10.3	\$ 6.3
Acheson / Big Lake	Watermains	\$ 21.8	\$ 8.3	\$ 8.0	\$ 6.2
	Reservoir	\$ 2.0	\$ 8.3	\$ 6.7	\$ 2.7
	Total	\$ 23.8	\$ 16.6	\$ 14.8	\$ 8.9
Parkland Fifth Meridian ASP	Watermains	\$ -	\$ -	\$ 4.8	\$ 2.7
	Reservoir	\$ -	\$ -	\$ 7.0	\$ -
	Total	\$ -	\$ -	\$ 11.8	\$ 2.7

9.0 DETAILED WASTEWATER SERVICING PLAN

9.1 Introduction

The detailed wastewater servicing plan focuses on servicing the three municipalities based on the Preferred Land Use Plan and utilizes information from the following documents:

- ◆ Town of Stony Plain Water and Sanitary Master Plan Update, March 2019,
- ◆ City of Spruce Grove Sanitary Sewer Master Plan, September 2013, and
- ◆ Acheson and Big Lake Area Sanitary Servicing Study Update, October 2016.

9.2 Collection System Servicing Strategy

The overall wastewater servicing plan is shown for the entire Tri-Municipal Area on **Figures 9.1** through **9.4** for the 10-year (2020/30), 20-year (2030/40), 30-year (2040/50), and 40-year (2050/60) growth horizons, respectively. More details regarding specific upgrades are summarized in their respective sections below.

Sanitary servicing for the three municipalities will ultimately flow through the ACRWC Parkland Sanitary Transmission System (PSTS) into the Parkland Pump Station, which pumps wastewater to the St. Albert Regional Trunk and the ACRWC treatment plant. It should be noted that the ACRWC will upgrade capacity along its current alignment to accommodate growth of all its member municipalities as long as members control their inflow / infiltration into the wastewater system.

9.2.1 Spruce Grove

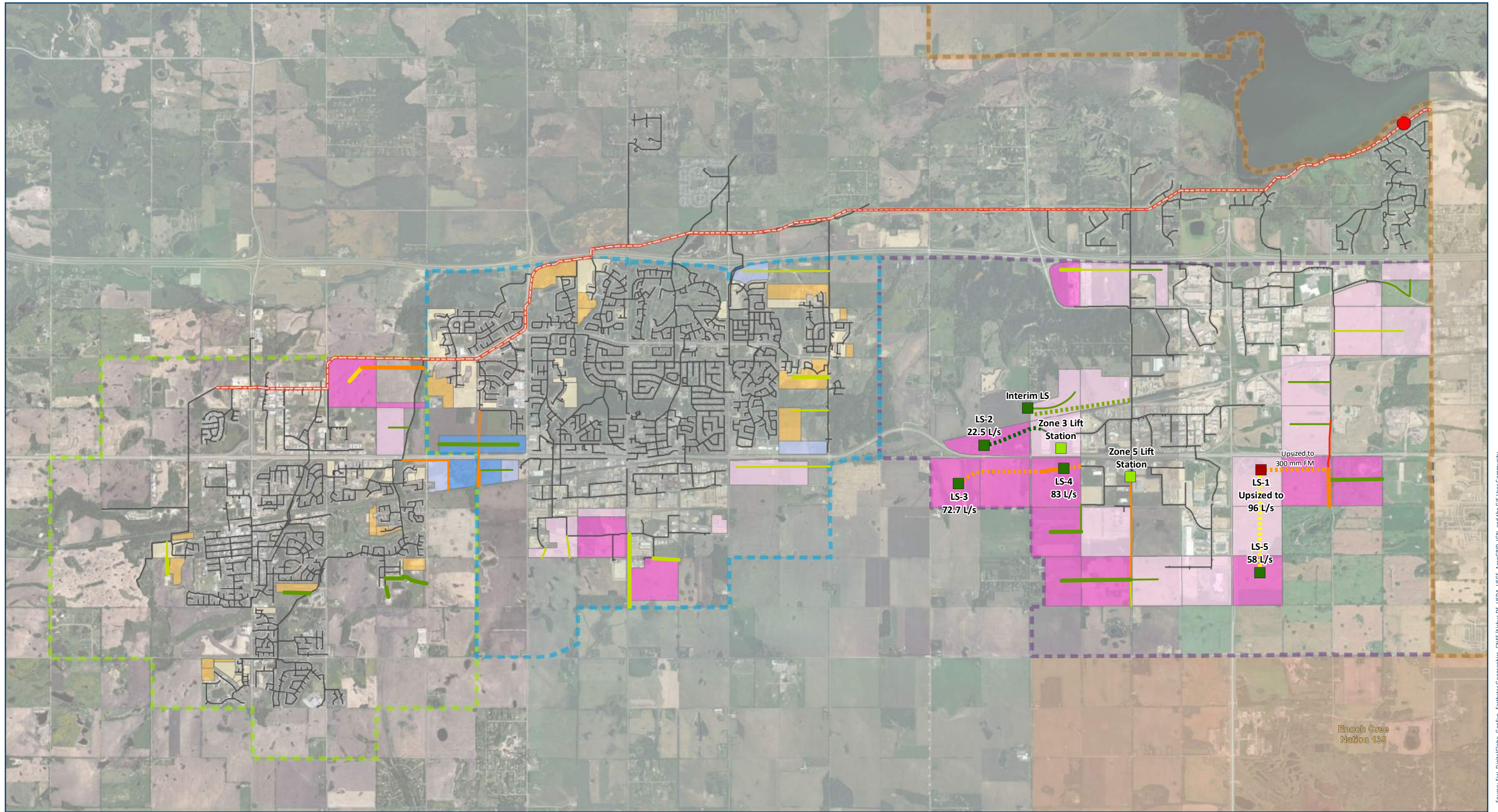
The following points summarize the sanitary sewer servicing concept for Spruce Grove:

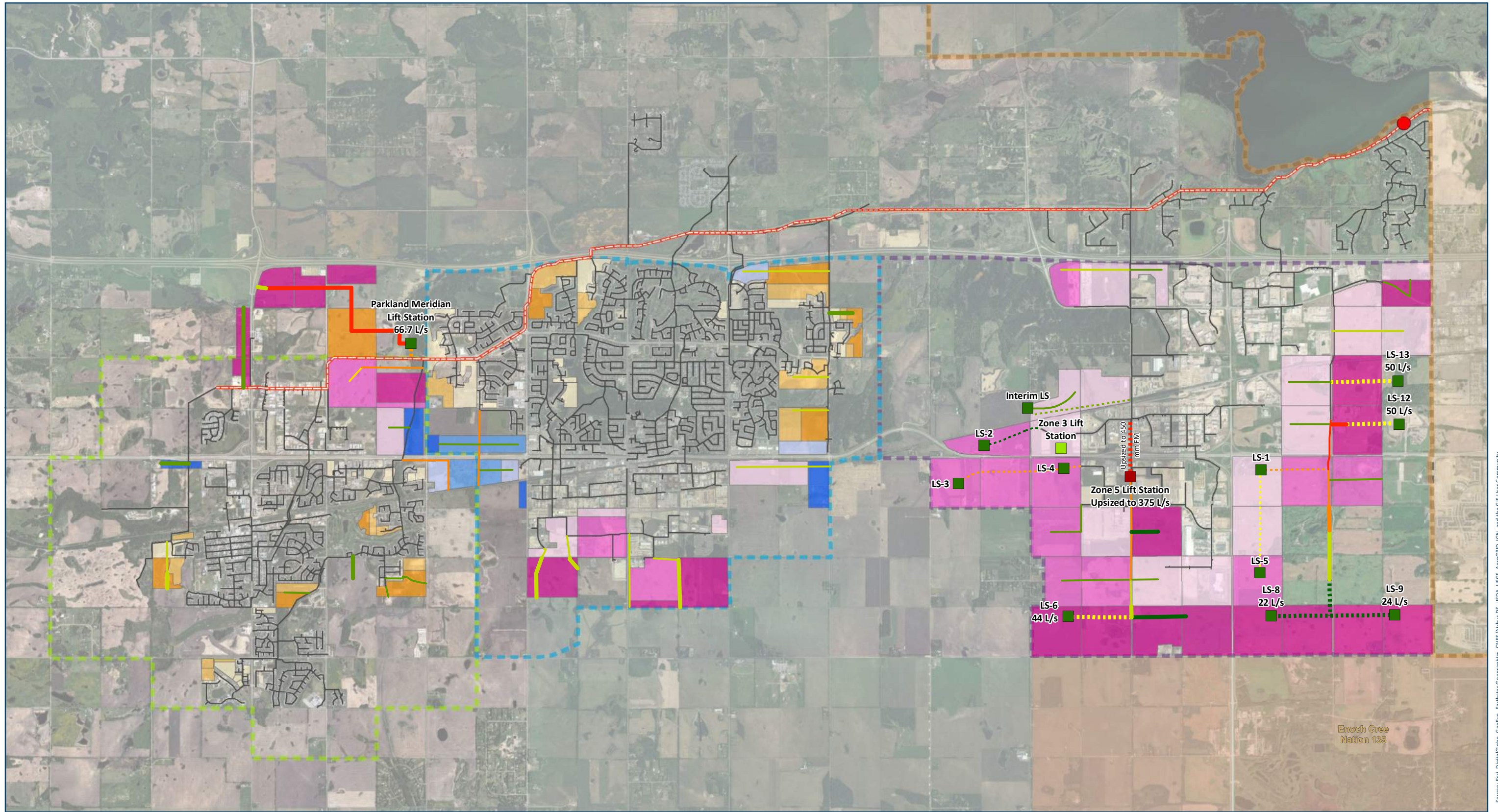
- ◆ Residential development on the east side of the City is to be serviced by 300 mm and 375 mm trunks branching from the Pioneer Trunk,
- ◆ Residential development in northwest Spruce Grove will be serviced by extensions of the existing network or serviced directly from the PSTS,
- ◆ Highway commercial development along Highway 16A is to be serviced by extensions of the Pioneer and Boundary Trunk Sewers, and
- ◆ Industrial development south of the CN Railway is to be serviced by 375 mm trunks extending from the upstream end of the West Trunk.

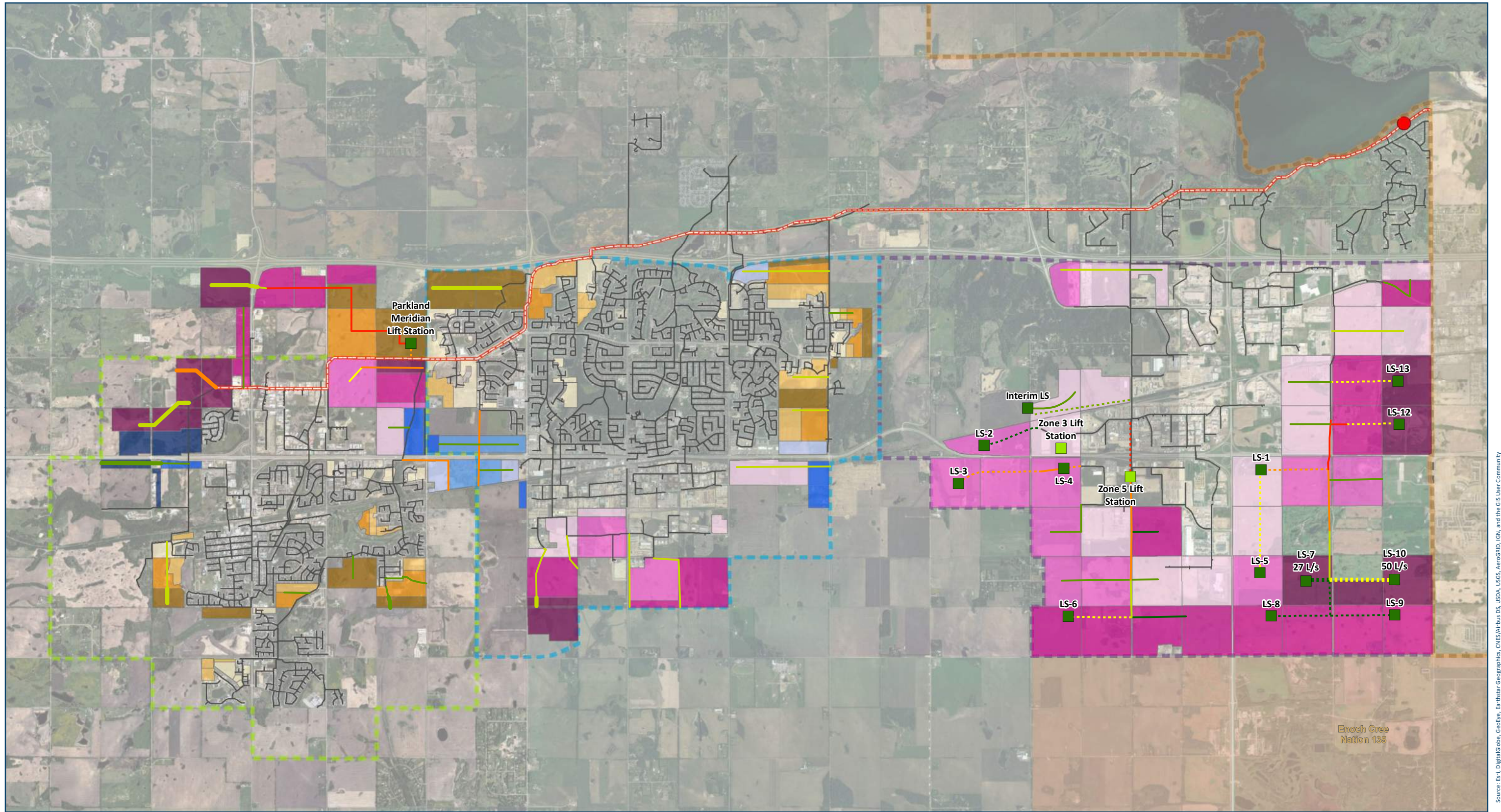
9.2.2 Stony Plain

Stony Plain development consists of residential development with the Town, commercial / industrial development along Highway 16A, and a significant amount of residential and industrial development in Parkland County within the Meridian Industrial Area north of Stony Plain. Stony Plain development is serviced from 300 mm to 525 mm sewers that branch off the East Trunk and West Trunk.









9.2.3 Parkland County – Fifth Meridian ASP

The Fifth Meridian ASP north of Stony Plain is to develop during the 30- and 40-year growth horizons and will consist of two connections to the PSTS:

- ◆ Industrial Development along the western edge of Highway 779 can be serviced through a 300 mm gravity sewer draining south parallel to the highway into the PSTS, and
- ◆ Residential and industrial development south of Highway 16 and east of Highway 779 are to be serviced through a 600 mm trunk draining south into the proposed Meridian Lift Station which will lift the flows into the PSTS.

Since the ground elevation naturally slopes to the north, the Meridian Lift Station is required to ensure that the proposed trunk can maintain minimum pipe slopes and ground cover.

During the 40-year growth horizon, there is one additional quarter section of land directly southwest of the Highway 779 and Highway 16 intersection that is to be serviced by an extension of the trunk upstream of the Meridian Lift Station. If serviced to the south, an additional lift station would be needed to maintain minimum depths and slopes and is therefore not recommended.

9.2.4 Parkland County – Acheson / Big Lake

Development within Acheson / Big Lake is entirely industrial and consists of several sanitary lift stations to pump wastewater from the south where the elevations drop considerably towards either of the Acheson or Bevington Trunks. These existing gravity trunks are located along Range Road 264 (Acheson Trunk) and along Bevington Road (Bevington Trunk) and convey the sanitary flows by gravity northwards to the PSTS. Key concepts from the servicing concept are listed below for each of the time frames.

Key concepts regarding the 10-year sanitary servicing concept are listed below:

- ◆ An interim lift station is required west of the Acheson Trunk and north of the CN Railway which will pump flows through a 200 mm forcemain into the Acheson Trunk until beyond the 40-year horizon where the proposed trunk west of the Wagner Natural Area (as shown in the Acheson / Big Lake Sanitary Servicing Study) can be constructed to service the area by gravity,
- ◆ Extension of the Acheson Trunk south towards Highway 628 will initiate the servicing of the southern area of the Acheson industrial area, and
- ◆ Lift Station #1 (LS-1) is to be constructed with an interim capacity of approximately 38 L/s which will pump flows into an interim 200 mm forcemain heading towards the Bevington Road Trunk extension.

The 20-year growth sanitary servicing concept includes:

- ◆ Construction of Lift Station #5 (LS-5) triggers upgrades at LS-1 including upsizing the 200 mm force main to its ultimate size of 300 mm and upgrading the pumping capacity from 38 to 96 L/s,
- ◆ Additional lift stations are proposed within west Acheson which pump sanitary flows towards the Acheson Trunk, and
- ◆ Additional branching of 300 mm sewers from the Acheson and Bevington Trunks.

The 30-year growth sanitary servicing concept includes:

- ◆ Construction of additional lift stations in the south which drain into the two gravity trunks heading north,
- ◆ Construction of Lift Stations #12 and #13 (LS-12 and LS-13) to service the 30-year industrial area in the quarter sections to the west of their location due to local topography draining eastwards, and
- ◆ Upgrades to the Zone 5 Lift Station including increasing the pumping capacity from 160 L/s to 375 L/s and upsizing the forcemain to 450 mm.

The 40-year sanitary servicing concept includes two final lift stations in the southeast corner of Acheson which pump flows into the Bevington Trunk.

9.3 Wastewater Servicing Cost Estimates

Wastewater servicing costs are summarized in **Table 9.1** for each of the growth scenarios. Cost estimates for proposed Acheson lift stations were provided directly from the Parkland County Off-Site Levy Bylaw and the average of these estimates was used in lieu of levy information for other lift stations where needed. For more detailed wastewater cost estimates, see **Appendix A**.

Table 9.1: Wastewater Servicing Cost Summary

Wastewater Costs		Costs (\$M)			
Municipality	Item	2020/30	2030/40	2040/50	2050/60
Stony Plain	Sewers	\$ 1.6	\$ 2.4	\$ 1.2	\$ 2.6
	Total	\$ 1.6	\$ 2.4	\$ 1.2	\$ 2.6
Spruce Grove	Sewers	\$ 4.7	\$ 3.1	\$ 1.7	\$ 1.0
	Total	\$ 4.7	\$ 3.1	\$ 1.7	\$ 1.0
Acheson / Big Lake	Sewers	\$ 7.9	\$ 3.2	\$ 2.5	\$ -
	Lift Stations & Forcemains	\$ 2.8	\$ 7.9	\$ 15.0	\$ 2.5
	Total	\$ 10.6	\$ 11.1	\$ 17.5	\$ 2.5
Parkland Fifth Meridian ASP	Sewers	\$ -	\$ -	\$ 4.1	\$ 0.6
	Lift Stations & Forcemains	\$ -	\$ -	\$ 2.3	\$ -
	Total	\$ -	\$ -	\$ 6.4	\$ 0.6

10.0 DETAILED STORMWATER SERVICING PLAN

10.1 Introduction

The detailed stormwater servicing plan focuses on servicing the three municipalities based on the land use plan provided by Stantec and is based on the following documents:

- ◆ Town of Stony Plain Stormwater Master Plan, April 2019,
- ◆ Town of Stony Plain Flood Mitigation Program, May 2020,
- ◆ City of Spruce Grove Stormwater Master Plan Update, October 2015,
- ◆ Acheson / Big Lake Area Master Drainage Plan – Amendment, August 2011,
- ◆ Acheson / Big Lake Area Master Drainage Plan Amendment Application Document, August 2011,
- ◆ Acheson / Big Lake Basin 1 Storm Design Preliminary Design Report, January 2013, and
- ◆ Acheson / Big Lake Basin 1 Stormwater Summary Report, March 2018.

10.2 Drainage System Servicing Strategy

The overall stormwater servicing plan is shown for the entire Tri-Municipal Area on **Figures 10.1** through **10.4** for the 10-year (2020/30), 20-year (2030/40), 30-year (2040/50), and 40-year (2050/60) growth horizons, respectively. More details regarding specific upgrades are summarized in their respective sections below.

The overall stormwater servicing strategy is based on maintaining the pre-development release rates via stormwater management facilities needed for every quarter section of development. The following release rates were used:

- ◆ 0.6 L/s/ha for areas south of Highway 16A and within Basin 1 of Acheson,
- ◆ 1.8 L/s/ha for the Dog Creek basin in Spruce Grove south of CNR, and
- ◆ 2.5 L/s/ha elsewhere within the Tri-Municipal area.

10.2.1 Spruce Grove

The stormwater servicing concept for Spruce Grove involves a series of SWMFs interconnected by storm trunks and/or ditches and eventually drains northwards to Atim Creek or other significant water courses. The storm sewers have been conceptually sized using the release rates listed above; however, the trunks on the west side of Spruce Grove are oversized to service additional area to the south that is not part of this growth plan but part of future development plans.

10.2.2 Stony Plain

The stormwater concept for Stony Plain involves utilizing SWMFs and associated ditch / storm trunk systems to convey pre-development flow rates to nearby watercourses including Heritage Creek, Whispering Waters Creek, Atim Creek and Stony Creek. The larger pond shown on the east edge of Stony Plain is an existing wetland and appropriate environmental approvals will need to be pursued if it is to be used for stormwater management.

10.2.3 Parkland County – Fifth Meridian ASP

The stormwater concept for the Fifth Meridian ASP north of Stony Plain utilizes SWMFs and associated ditch / storm trunk systems to convey pre-development flow rates to Atim Creek and Whispering Waters Creek.

10.2.4 Parkland County – Acheson / Big Lake

Stormwater management within Acheson is more complex due to the internal (bowl-shaped) drainage within Basin 1 of the Acheson / Big Lake area. The Acheson Basin 1 Preliminary Design Report and Summary Report propose SWMFs at each quarter section with small pump stations to pump stormwater into the Acheson stormwater trunk located along Highway 60 based on a release rate of 0.6 L/s/ha. There are 19 proposed pump stations within the south end of the Acheson Industrial Area and main branches of forcemain ranging from 200 mm to 500 mm. One branch of the forcemain system has already been constructed west of Highway 60 and south of Highway 16A along with several ponds and pump stations.

In the northeast, gravity drainage is feasible as drainage naturally drains northwards towards Big Lake.

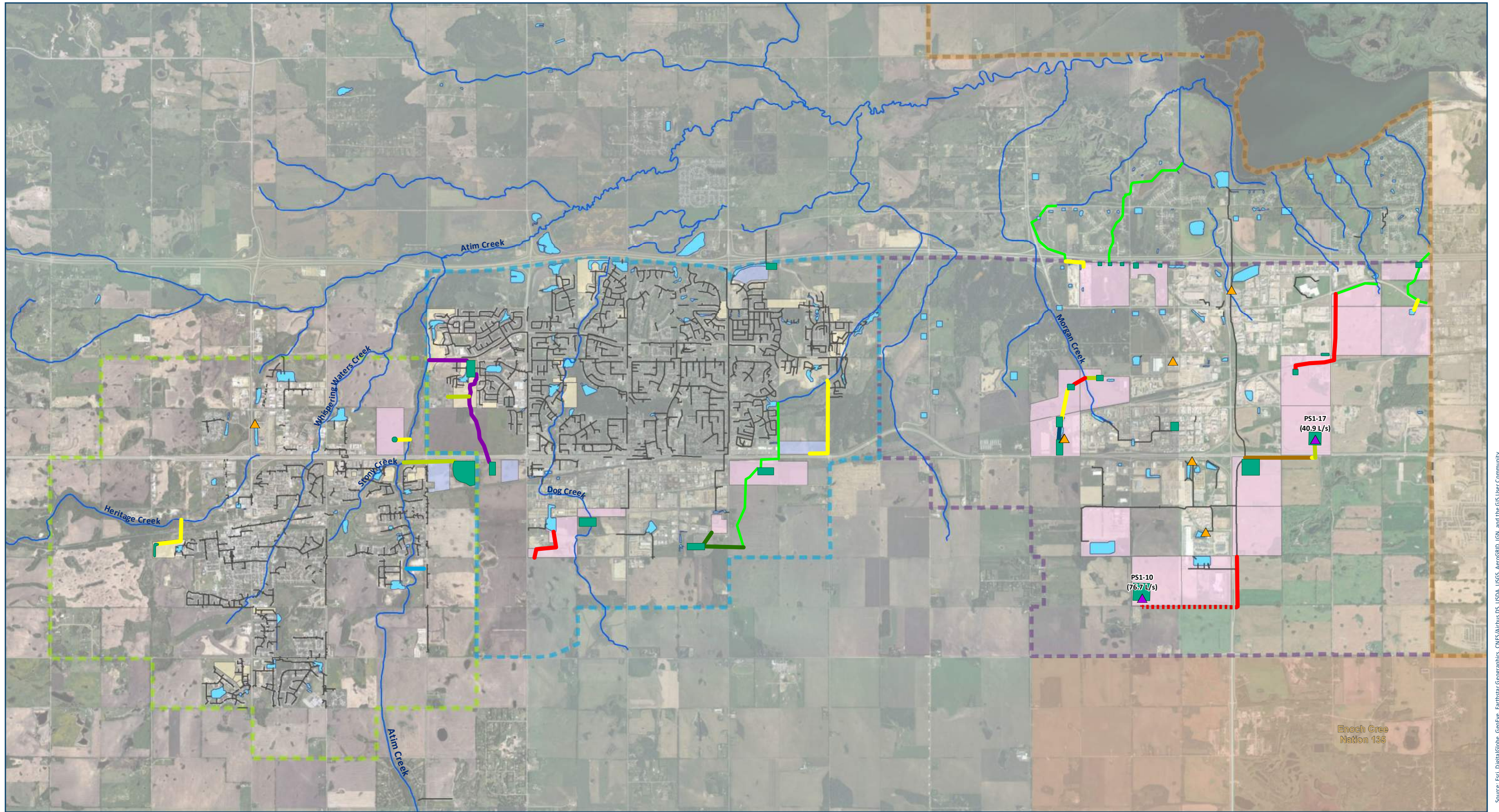
The growth in west Acheson is serviced by ponds and stormwater trunks that flow into natural drainage channels located nearby such as Morgan Creek. Construction in this area will need to consider environmental risks associated with the underlying aquifer and recharge zone. Additionally, flows should be restricted in this area to reduce the erosion risks to the natural drainage channels.

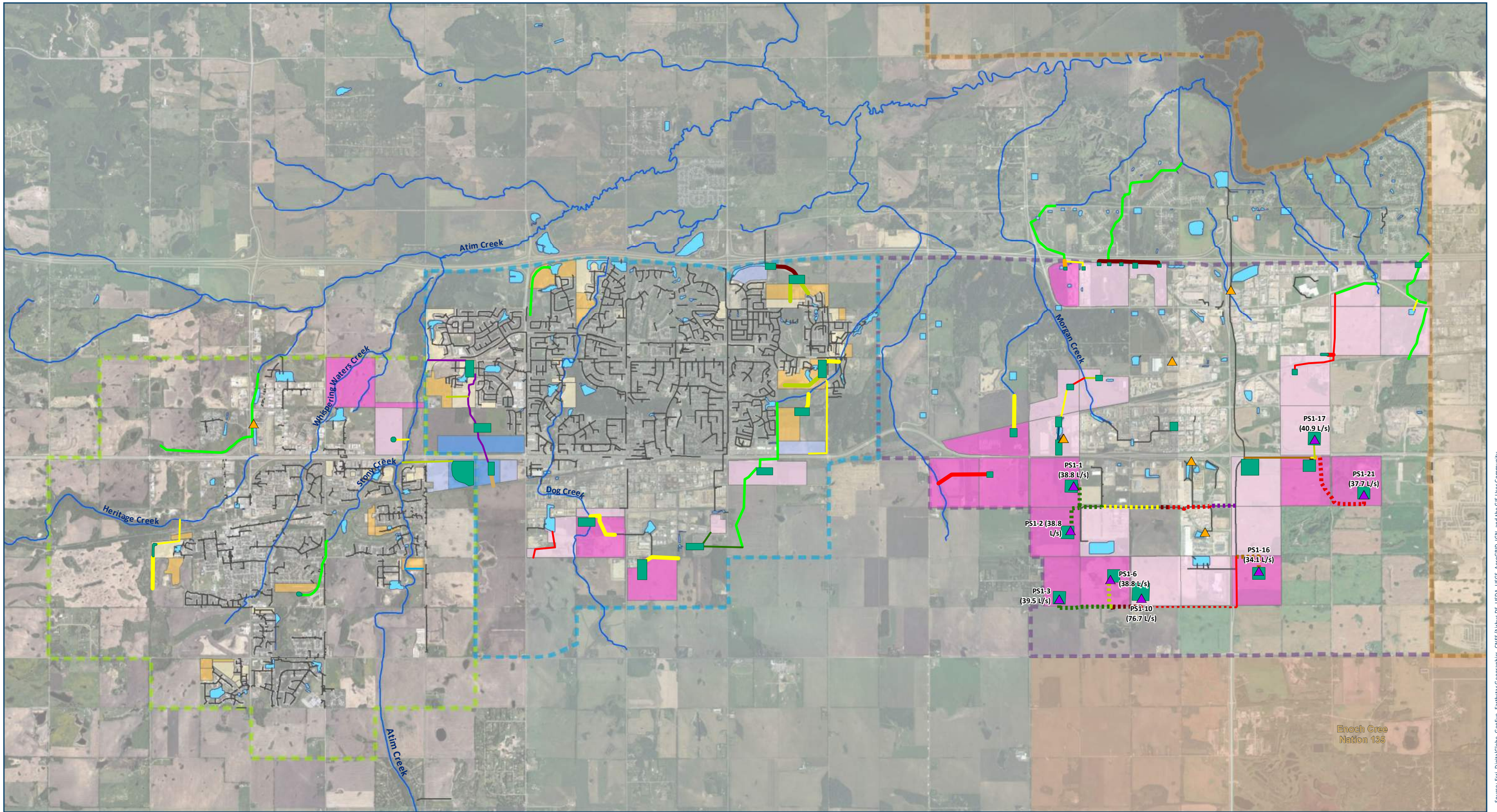
10.3 Stormwater Servicing Cost Estimates

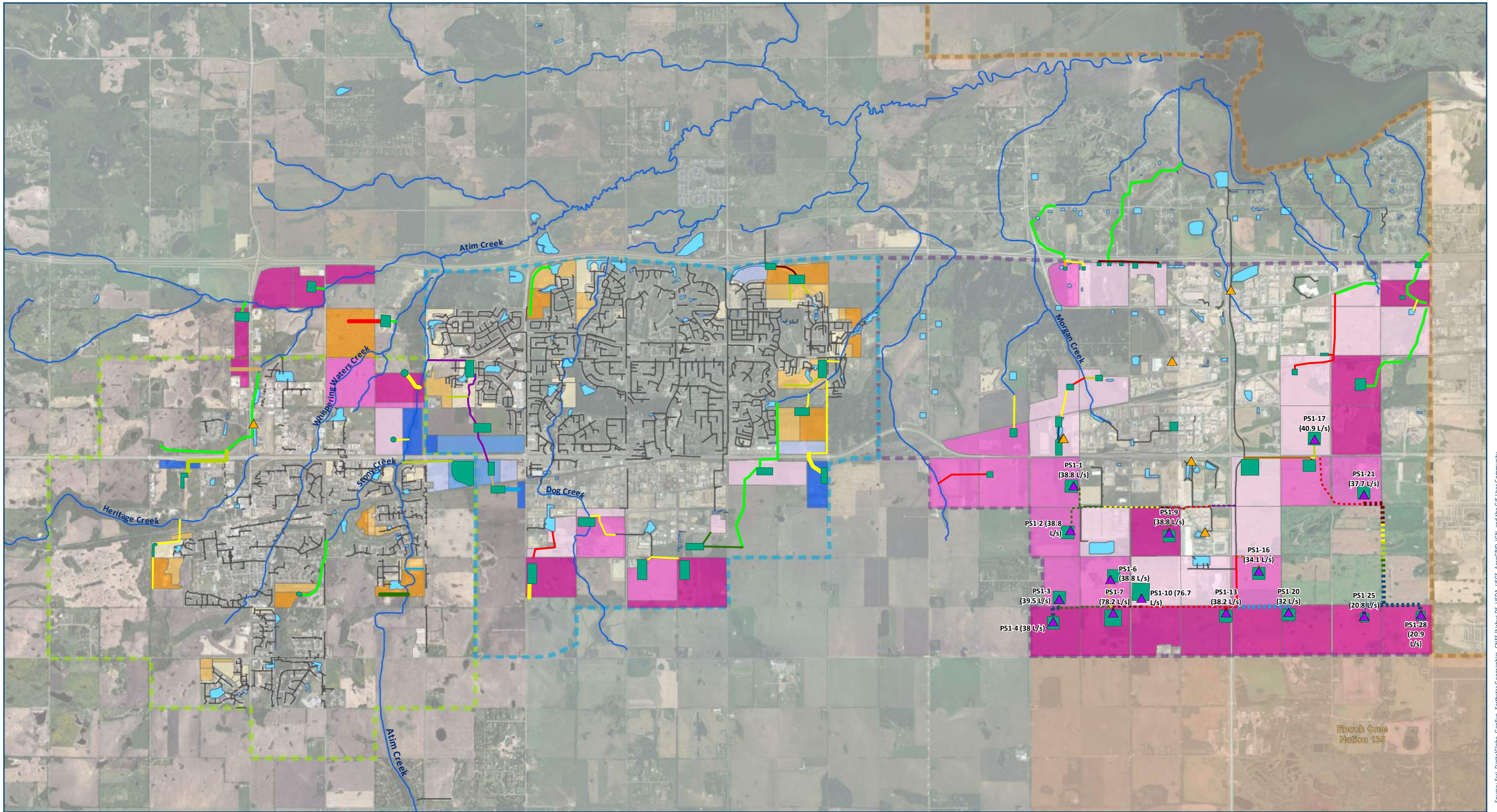
Stormwater servicing costs are summarized in **Table 10.1** for each of the growth scenarios. It should be noted that SWMFs are excluded from the cost estimates since most of the SWMF costs are for excavation which are part of developer's on-site servicing costs. For more detailed stormwater cost estimates, see **Appendix A**.

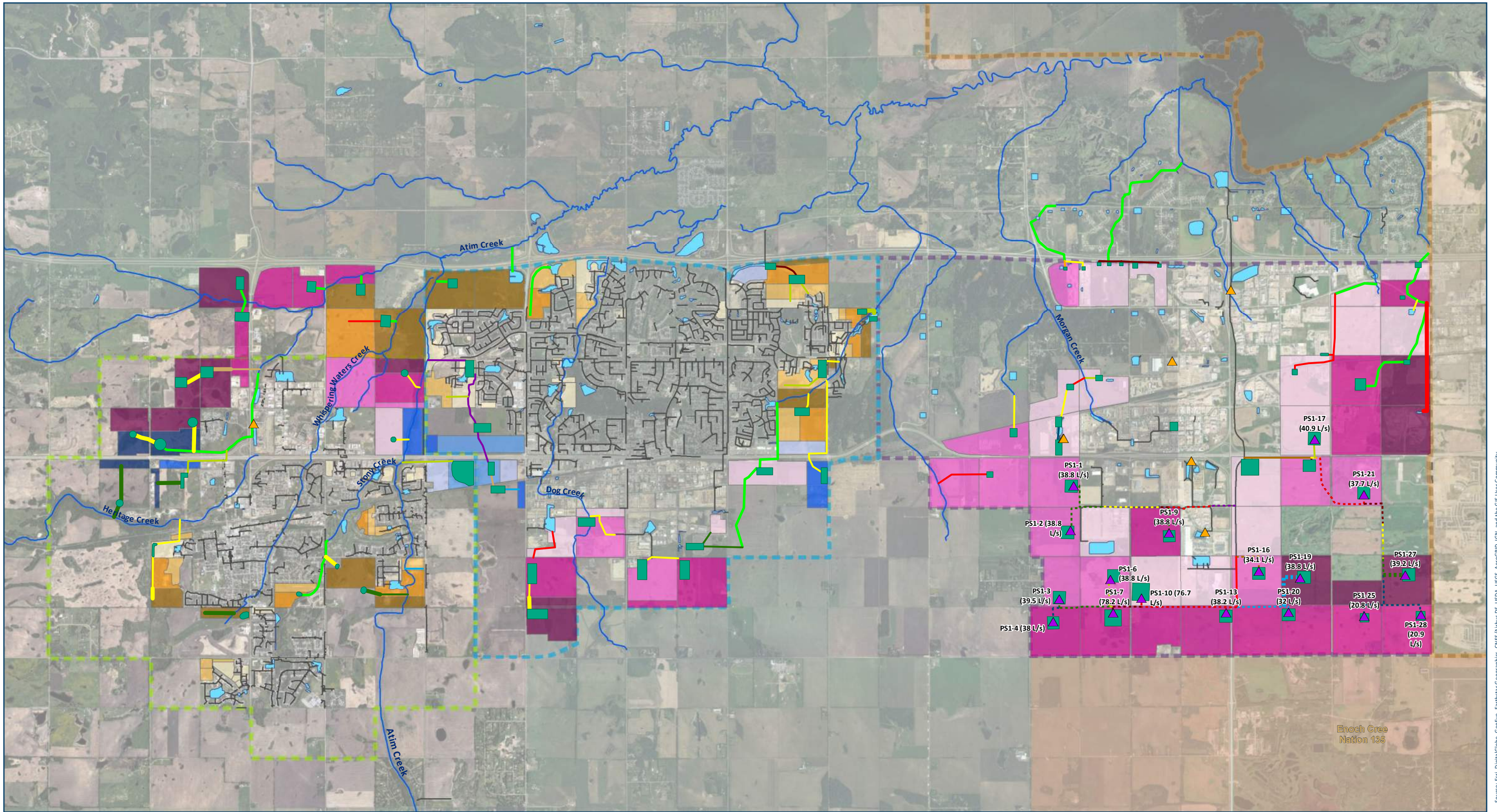
Table 10.1: Stormwater Servicing Cost Summary

Stormwater Costs		Costs (\$M)			
Municipality	Item	2020/30	2030/40	2040/50	2050/60
Stony Plain	Sewers	\$ 1.7	\$ 0.4	\$ 2.0	\$ 3.0
	Total	\$ 1.7	\$ 0.4	\$ 2.0	\$ 3.0
Spruce Grove	Sewers	\$ 5.3	\$ 2.8	\$ 0.7	\$ 0.3
	Total	\$ 5.3	\$ 2.8	\$ 0.7	\$ 0.3
Acheson / Big Lake	Sewers	\$ 5.3	\$ 3.7	\$ 0.4	\$ 1.8
	Lift Stations & Forcemains	\$ 8.0	\$ 11.8	\$ 12.4	\$ 2.6
	Total	\$ 13.3	\$ 15.5	\$ 12.8	\$ 4.4
Parkland Fifth Meridian ASP	Sewers	\$ -	\$ -	\$ 0.4	\$ -
	Total	\$ -	\$ -	\$ 0.4	\$ -









11.0 DETAILED TRANSPORTATION SERVICING PLAN

11.1 Introduction

The following section describes the detailed servicing plans for each service area including roadways, transit, active transportation, and goods movement. The detailed servicing plan for transportation is based on information available in the following sources:

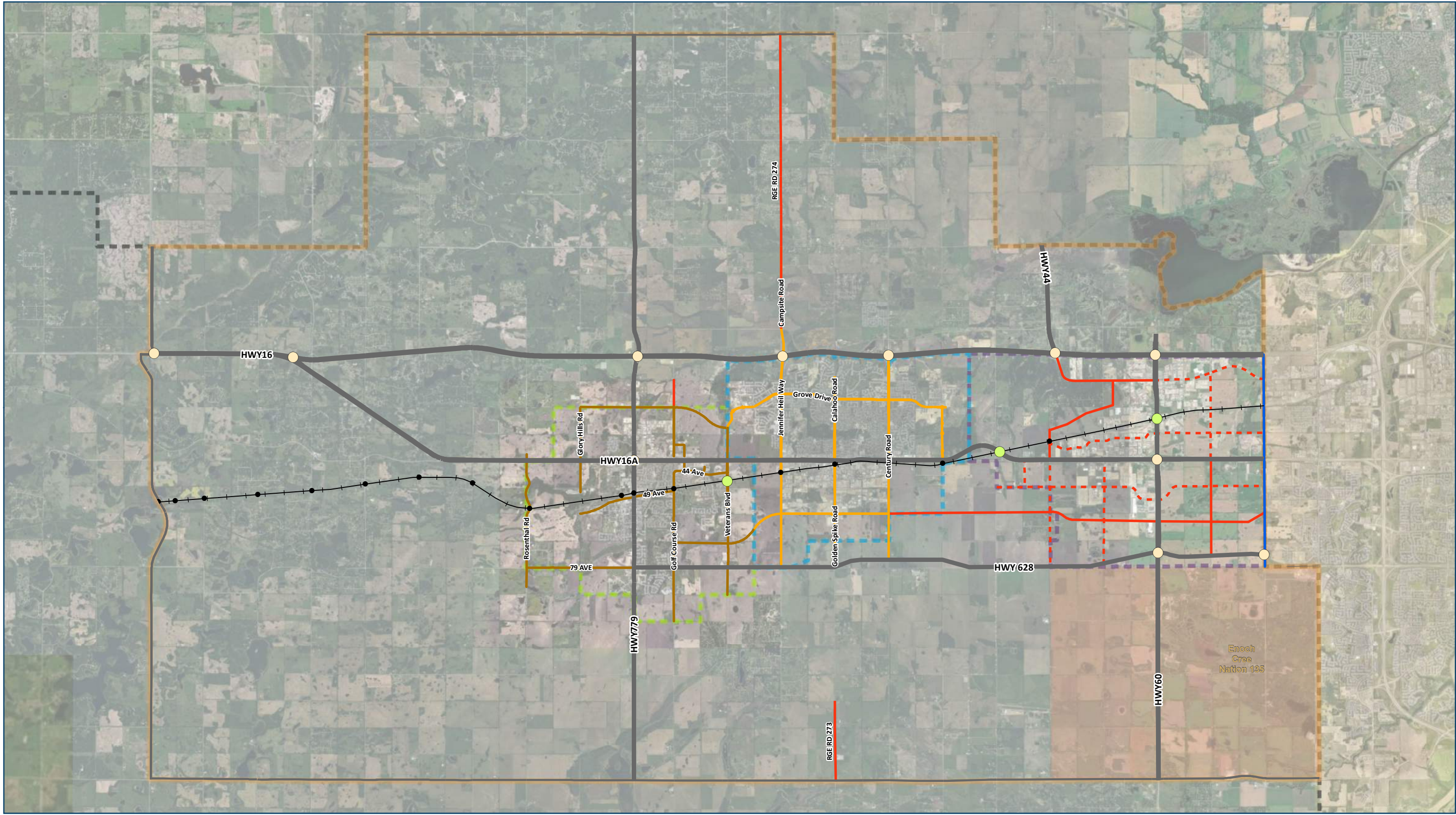
- ◆ Highway 628 Realignment Functional Planning Study (2008)
- ◆ Stony Plain Development Charges Report (2017 Update):
- ◆ Spruce Grove Off-site Levy Annual Report (2020)
- ◆ Acheson and Big Lake Traffic Impact Assessment (2018)
- ◆ Edmonton Metropolitan Regional Board (EMRB), Transportation Priorities (2019)
- ◆ Edmonton Metropolitan Transit Service Commission (EMTSC), Building a Regional Transit Services (2020) (previously Regional Transit Services Commission)
- ◆ Tri-Municipal Transit Plan (2018)

Generally, transportation network improvements outlined in the above sources are adopted and expanded in this study where needed for servicing future growth areas and to align with strategic action items.

Transportation plans in the following section are subject to change with several concurrent transportation studies including, Transportation Master Plan updates by Parkland County and Stony Plain and the Integrated Regional Transportation Master Plan update by the Edmonton Metropolitan Region Board. Detailed transportation plans from these studies were not available at the time of this report. In addition, Spruce Grove indicated that their Transportation Master Plan is planned to be updated and their current version is no longer current.

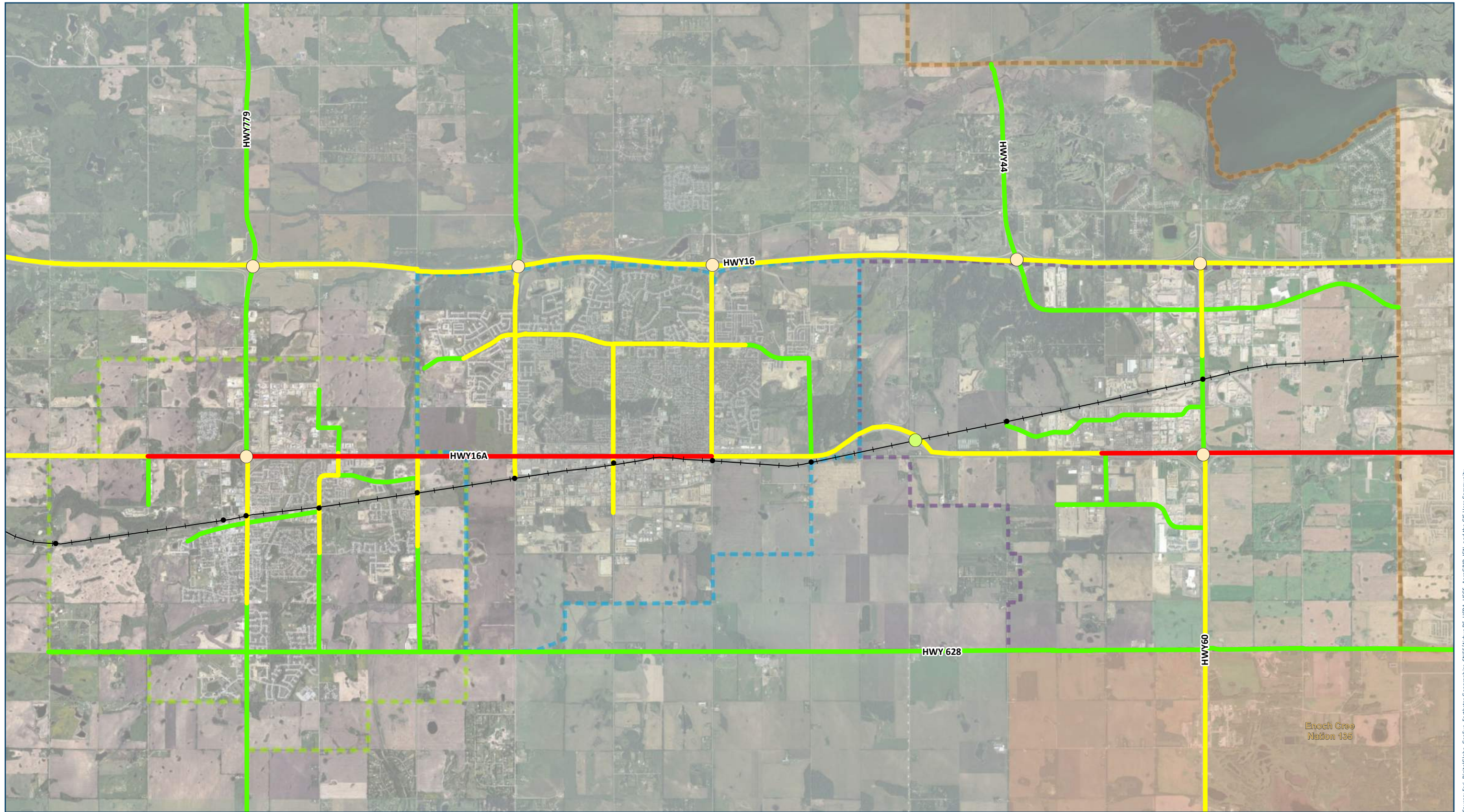
11.2 Roadways

Schematic transportation servicing is shown in **Figure 11.1** for roadways. The servicing plans incorporate and expand on improvements identified in the reference transportation plans as needed for servicing growth. **Figures 11.2 to 11.7** illustrate the detailed servicing plan in 10-year increments and follows the incremental growth in land use. More details regarding specific upgrades are summarized in their respective sections below.



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Date: 2021-03-25



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

TRI-MUNICIPAL
REGIONAL PLAN

1:60,000

0 0.5 1 2 3 4 km

Coordinate System: CANA83-3TM114

Railway

Rail Crossing

Interchange

Rail Grade Separation

2 Lanes

4 Lanes

6 Lanes

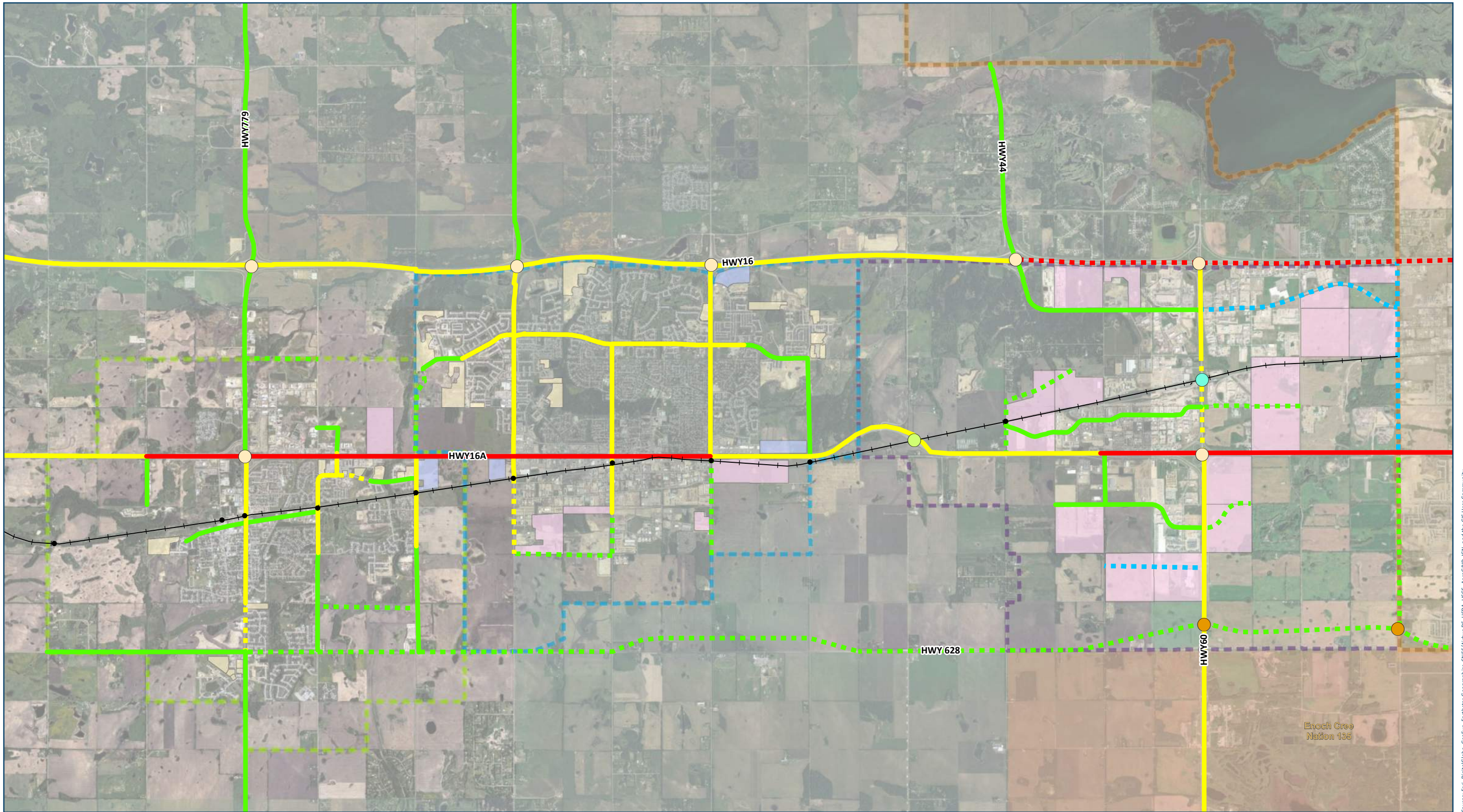
TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 11.2

TRANSPORTATION
NUMBER OF LANES (2020)

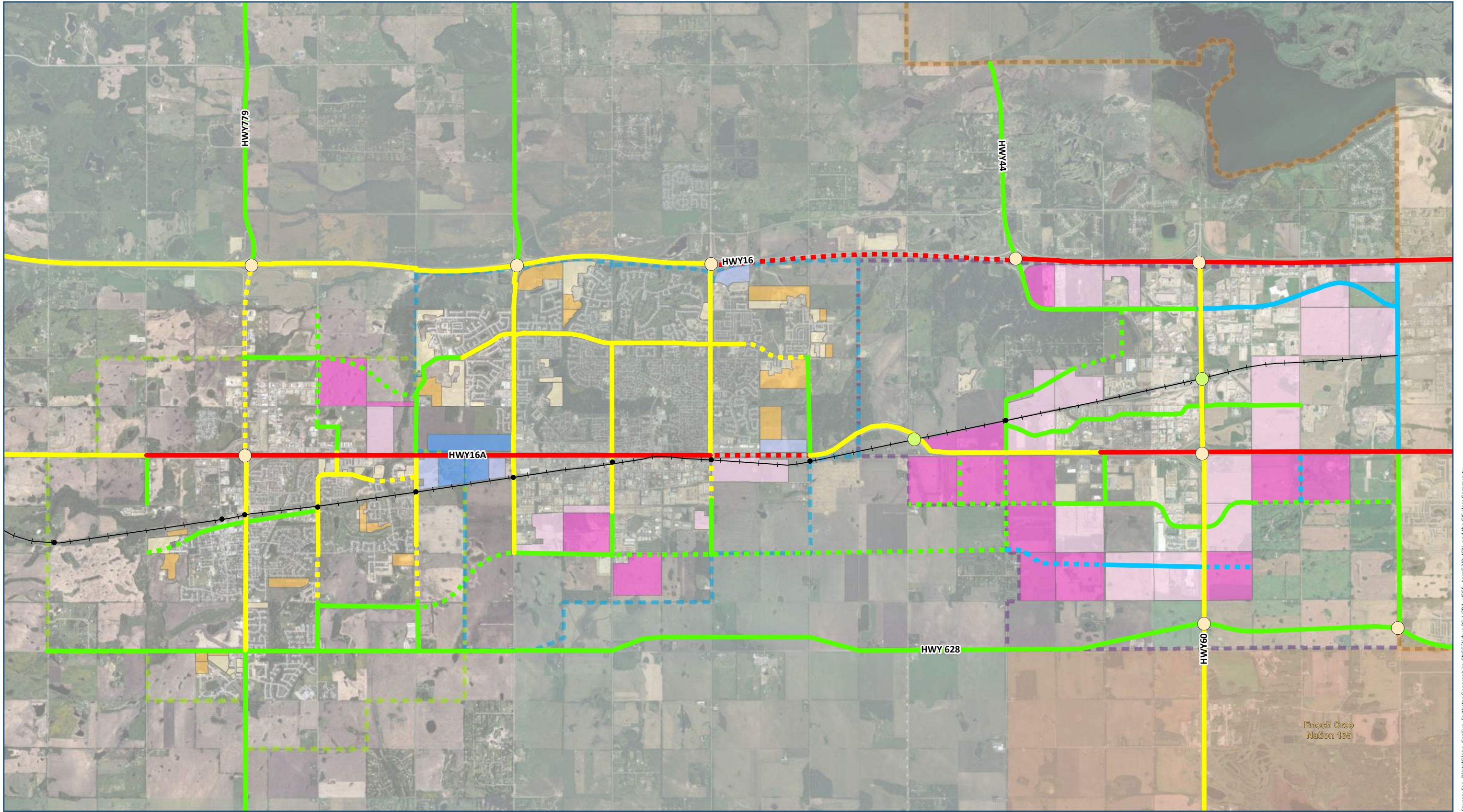
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Date: 2021-03-29



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

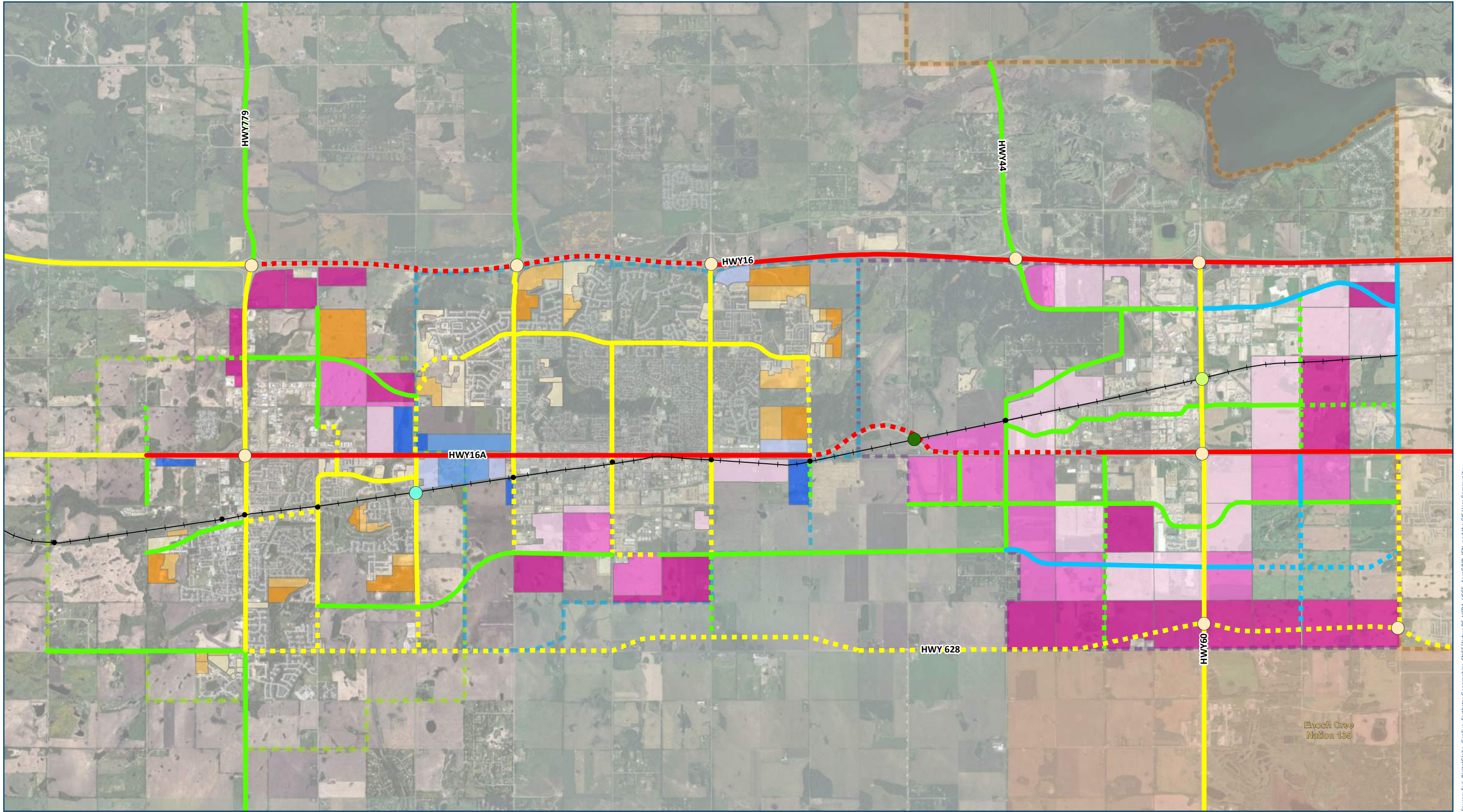
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Date: 2021-03-29



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

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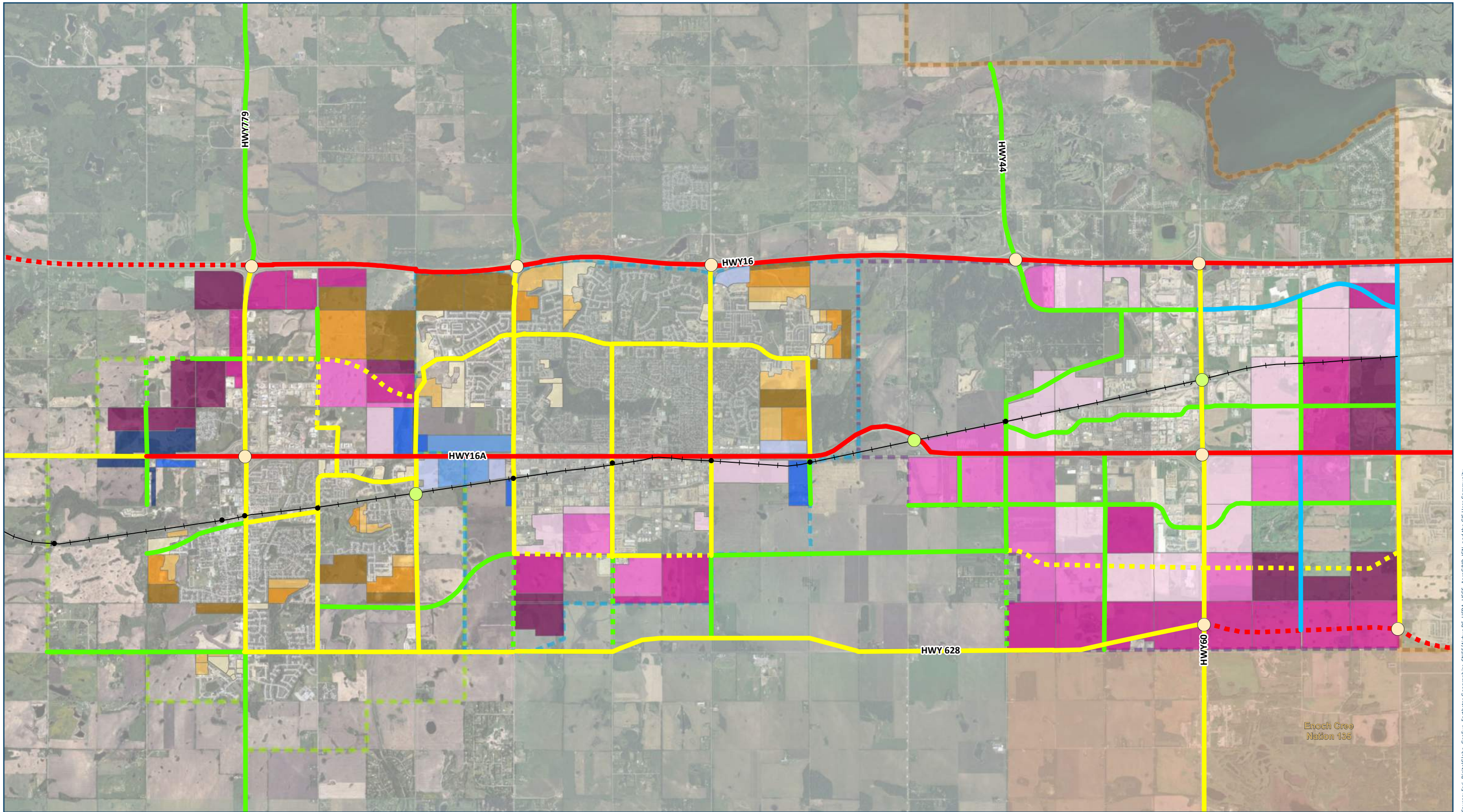
Date: 2021-03-29



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

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Date: 2021-03-29



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

TRI-MUNICIPAL
REGIONAL PLAN

Coordinate System: CANA83-3TM114

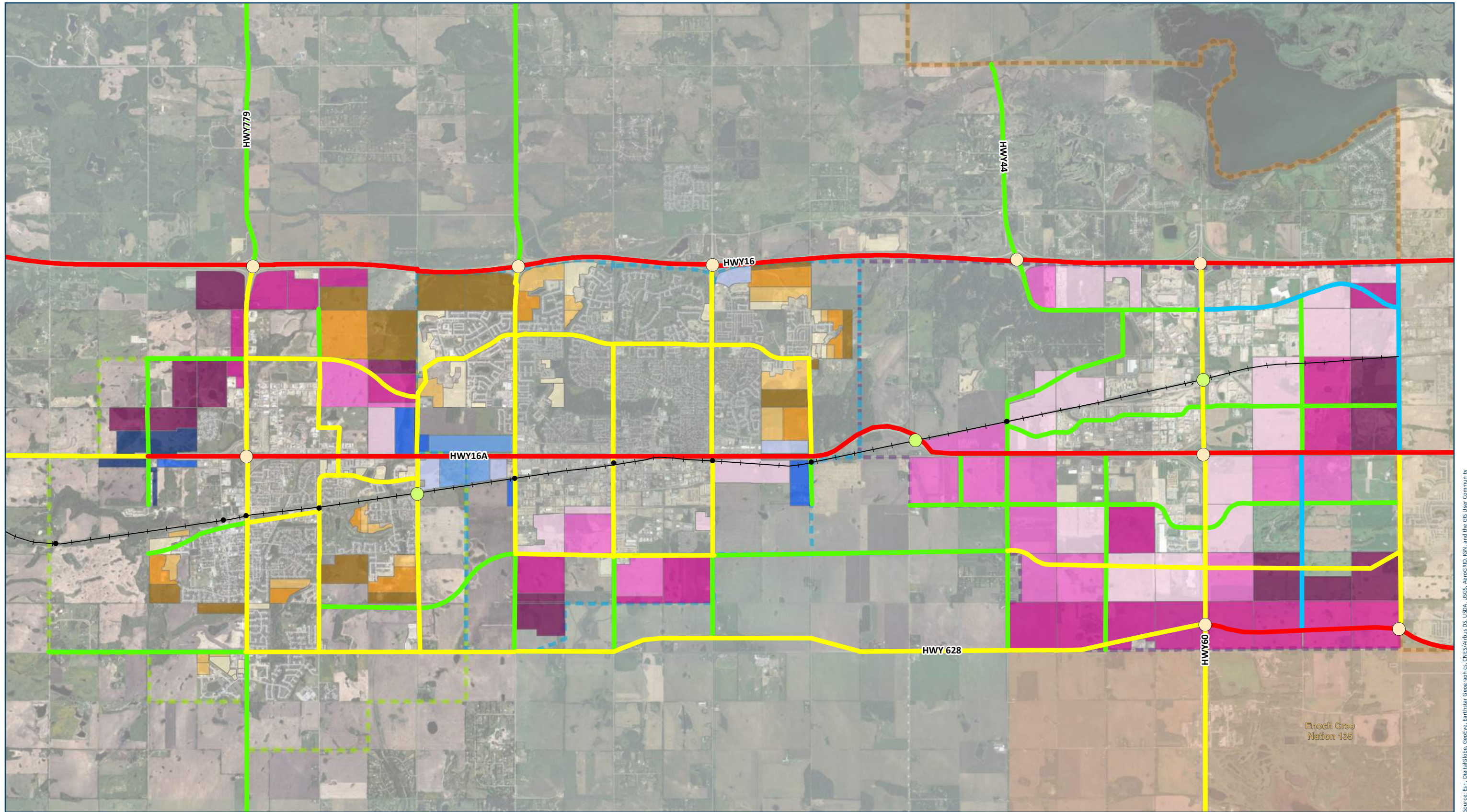
Preferred Land Use Scenario

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 11.6
TRANSPORTATION
NUMBER OF LANES (2050-60)

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Date: 2021-03-29



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

11.2.1 Alberta Transportation

Highway 16

The following points summarize the transportation servicing concept for Highway 16:

- ◆ Highway 16 widening from four to six lanes is complete within the 40-year timeline. The project is based on the planning study identified in the EMRB's 2019 priorities which identifies the widening between Anthony Henday Drive to Highway 779. The planning study was started in late 2020 and is in the early stages and the results may confirm the timing for widening.

Highway 16 A

The following points summarize the transportation servicing concept for Highway 16A:

- ◆ Highway 16A currently provides six lanes for the majority of the subject areas, with the exception of a section between Spruce Grove (Century Road) and Acheson (Range Road 264), which is currently four lanes. Widening of this section occurs through the 20 and 30 year horizons and includes widening of the existing CN Rail grade separating crossing. Reviewing site images, it appears that the existing CN crossing is not oversized to accommodate widening to six lanes and will need to be widened to support six lanes. Confirmation of oversizing was not available at the time of this writing.

Highway 628

The following points summarize the transportation servicing concept for Highway 628:

- ◆ Full implementation of the realignment is completed within 10 years, including the interchanges at 231 Street (City of Edmonton) and Highway 60 and extends to Highway 779.
- ◆ Future expansion to four and six lanes is based on the Acheson/Big Lake TIA and subject to future study.

Highway 60

The following points summarize the transportation servicing concept for Highway 60:

- ◆ Widening between Highway 16 and Highway 16A is completed within the 10-year time frame and includes a new grade separated rail crossing and interchange upgrade at Highway 16A.

Highway 779

The following points summarize the transportation servicing concept for Highway 779:

- ◆ A short 2-lane section of Highway 779 within the Town of Stony Plain is expected to be widened to four lanes near the Town's south boundary. Widening to four lanes between Highway 16 and Highway 16 A occurs within the 20-year horizon and will require major rehab/reconstruction of the Highway 779/Highway 16 interchange.

11.2.2 Spruce Grove

The following points highlight certain aspects of the transportation servicing concept for Spruce Grove:

- ◆ Veterans Boulevard connects to Grove Drive on the boundary with Stony Plain and is assumed as shared investment (50/50) with Stony Plain.
- ◆ A new east/west roadway extends from Tamarack Way to the west boundary and connects to a future roadway connecting from the Town of Stony Plain. A small portion, currently outside of Spruce Grove's boundary, is assigned to Spruce Grove's transportation network for the purposes of this study.
- ◆ North/south roadways connecting to Highway 628 are also assigned to Spruce Grove's transportation network, but depending on cost sharing responsibilities and other negotiations may be part of Parkland County's transportation network.
- ◆ All roadways identified are assumed to be two or four lane urban arterial roads.

11.2.3 Stony Plain

The following points highlight certain aspects of the transportation servicing concept for Stony Plain:

- ◆ Boundary Road is assumed as shared investment with the City of Spruce Grove and connected to a future east/west corridor extending along the north Town boundary. The east/west roadway alignment located in the northeast is based on the town's development charges report and may change subject to future study and/or completion of the Town's Transportation Master Plan.
- ◆ A new east/west roadway extends between Golf Course Road to the east boundary and connects to a future roadway from the City of Spruce Grove. The pursuit of an east/west roadway alignment connecting between Spruce Grove, Stony Plain and Acheson is a strategic recommendation in the context of benefiting the tri-region area, including supporting transit, providing an alternative east/west connection and supporting a future oversize/overweight corridor.
- ◆ Future residential areas in the southwest will have transportation servicing from the 49 Avenue extension west of Highway 779 and other future collectors in the area.
- ◆ All roadways identified are assumed to be divided two or four lane urban arterial roads.
- ◆ Highway 779, Highway 16A and Highway 628 projects are excluded from the projects allocated to Stony Plain costs, but this is subject to future negotiations with Alberta Transportation.

Grade Separated Rail Crossing (Spruce Grove and Stony Plain)

A centrally located grade separated rail crossing is proposed to be located south of Highway 16A, on Veterans Boulevard and is intended to benefit the overall transportation network, connecting near the boundary of Spruce Grove and Stony Plain and to a significant portion of growth areas. The grade separated rail crossing provides substantial benefit to the area as the nearest grade separate crossing is on Highway 16A near Acheson. The location is intended to benefit existing and future growth areas in Stony Plain and Spruce Grove and construction is within the 30-year time frame. The location, feasibility, costs, land requirements, utility conflicts, topography, and other constraints and other aspects required further study.

11.2.4 Parkland County – Fifth Meridian Business Park ASP

The following points highlight certain aspects of the transportation servicing concept for the Fifth Meridian Business Park ASP area:

- ◆ A short roadway segments provides connectivity to the future residential area, which transitions to a collector roadway within the area. This roadway may connect into the adjacent industrial area for the purposes of providing local transit but is not recommended to accommodate a truck route for servicing the industrial area.
- ◆ Industrial areas take direct access to Highway 779 but may have some level of access from the adjacent residential potentially for local transit, but not as a truck route.

11.2.5 Parkland County – Acheson/Big Lake The following points highlight certain aspects of the transportation servicing concept for Acheson/Big Lake:

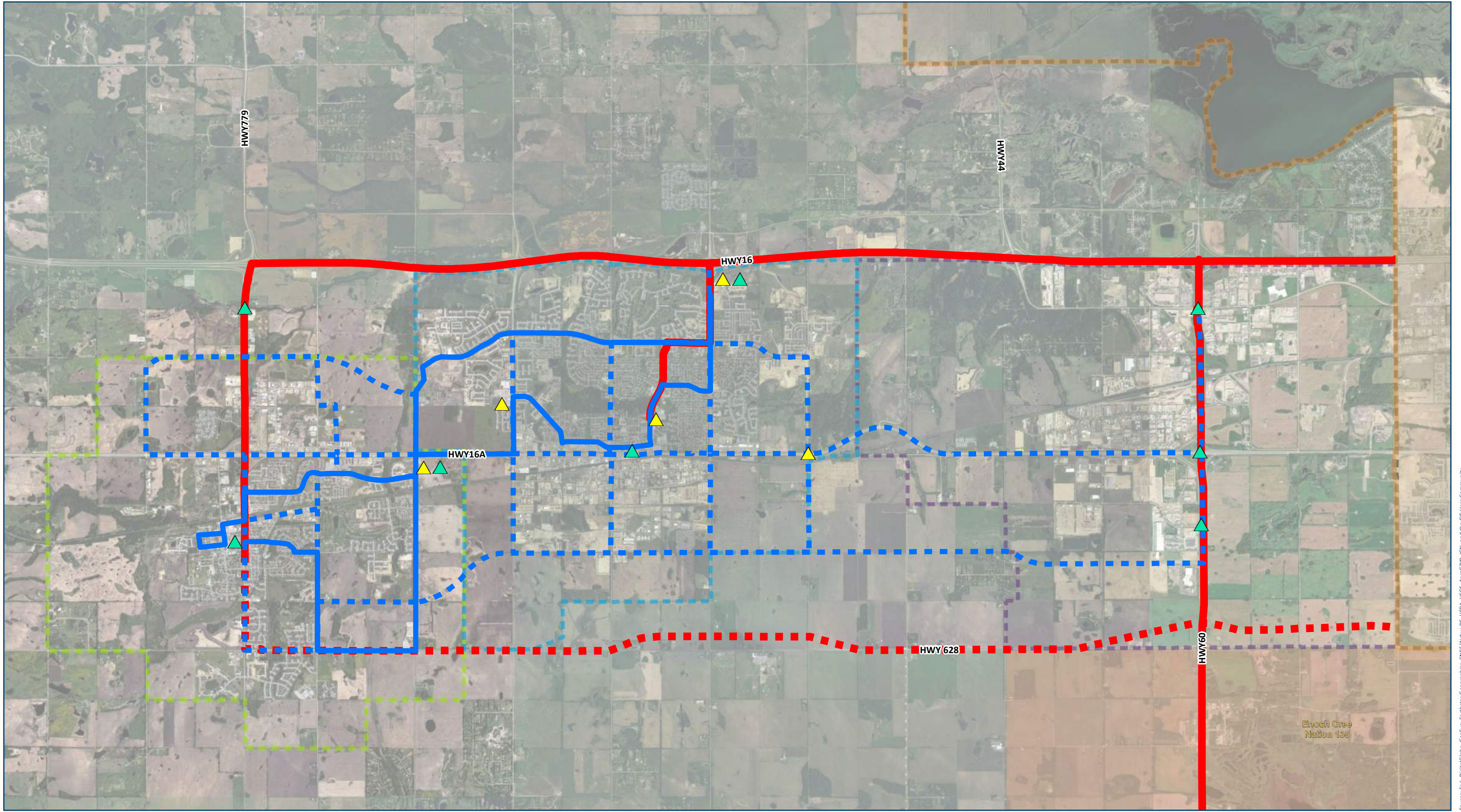
- ◆ 231 Street located on the east boundary is a shared project with the City of Edmonton, based on the Acheson/Big Lakes TIA. Phase 1 (first half) has been designed by Parkland County as a hybrid standard with rural drainage on the county side and the option for Edmonton to widen to rural or urban standard on the east side.
- ◆ 92 Avenue alignment is slightly revised compared to the Acheson/Big Lakes TIA due to existing residential at the west boundary of the growth areas.
- ◆ 96 Avenue is extended into Spruce Grove and further west through additional improvements in Stony Plain, providing an extensive east/west connection paralleling Highway 16A.

11.3 Transit

Future transit services are based on the Edmonton Metropolitan Transit Services Commission (EMTSC) Building a Regional Transit Services in the Edmonton Metropolitan Regional (2020) and the Tri-Municipal Transit Plan (2017). The 2020 RTSC report provides the general business case outlining the cost savings realized with implementation of a RTSC, compared to existing regional transit services provided by individual municipalities and analyzes the economic benefits up of a RTSC to the 2026 horizon. The RTSC report offers insights into potential regional transit service routes, costs, and cost sharing formulas with member municipalities, although implementation and verification of routes and costs is still underway. The Tri-municipal Transit Plan pre-dates the 2020 RTSC plan, but differentiates transit provided regionally with those provided within the Tri-municipal and studies this over a 10-year period. The detailed transit servicing plans provided herein attempts to combine and expand on the aforementioned plans in order to service growth areas to the 2060 horizon. A such, the transit routes provided are highly conceptual and intended as a representative example of how transit services may be delivered within the subject area and subject to further study.

Transit plans are illustrated on **Figure 11.8**. and more details regarding specific plans are summarized in the following sections. For the purposes of this report, growth in transit services correlate to land use growth and roadway expansion as illustrated in **Figures 11.2 to 11.7**.

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

11.3.1 Tri-municipal Transit

Tri-municipal transit services are coordinated transit services administered by the Tri-municipal municipalities within the subject area and connecting to RTSC regional transit. Tri-municipal transit services are identified in the Tri-municipal Transit Plan as local connectors, local core routes, neighbourhoods routes and targeted transit. Local connector routes and local core routes provide higher frequency transit services, connecting key destinations in the Tri-region and on key corridors within municipalities connecting to regional (RTSC) and local neighbourhood routes. Neighbourhood routes provide local transit by individual municipalities to lower density areas connecting to higher order transit routes. Targeted transit is directed to specific users, markets and special events.

Local connectors and local core routes are adopted from the Tri-municipal Transit Plan and include routes travelling between Stony Plain and Spruce Grove and are expanded to service growth areas to the 2060 horizon. Proposed routes include dedicated connections between Stony Plain, Spruce Grove and Acheson along Highway 16A. Proposed routes also connect into future industrial areas in northwest Stony Plain and south Spruce Grove. Neighbourhood routes consist of current local transit offered in Spruce Grove and future routes planned in Stony Plain and focus on connecting less dense areas to higher order transit services and are subject to future review.

11.3.2 RTSC Transit

RTSC operates regional rapid and express transit service between member municipalities in the Edmonton Metropolitan Region and provides less direct service within the subject area. RTSC transit services are identified in the Tri-municipal Transit Plan as regional connectors, connecting between Stony Plain, Spruce Grove, Acheson and the Edmonton Metropolitan Region. Current plans for regional transit services outlined in the 2020 RTSC plan are adopted and include an express route along Highway 60 and Highway 16, connecting to Stony Plain, Spruce Grove and Acheson. Regional transit routes shown in the 2020 plan are expanded to accommodate future growth areas and shown as proposed RTSC routes along Highway 628. Implementation of formally led RTSC routes are still in the early stages and the routes are subject to change.

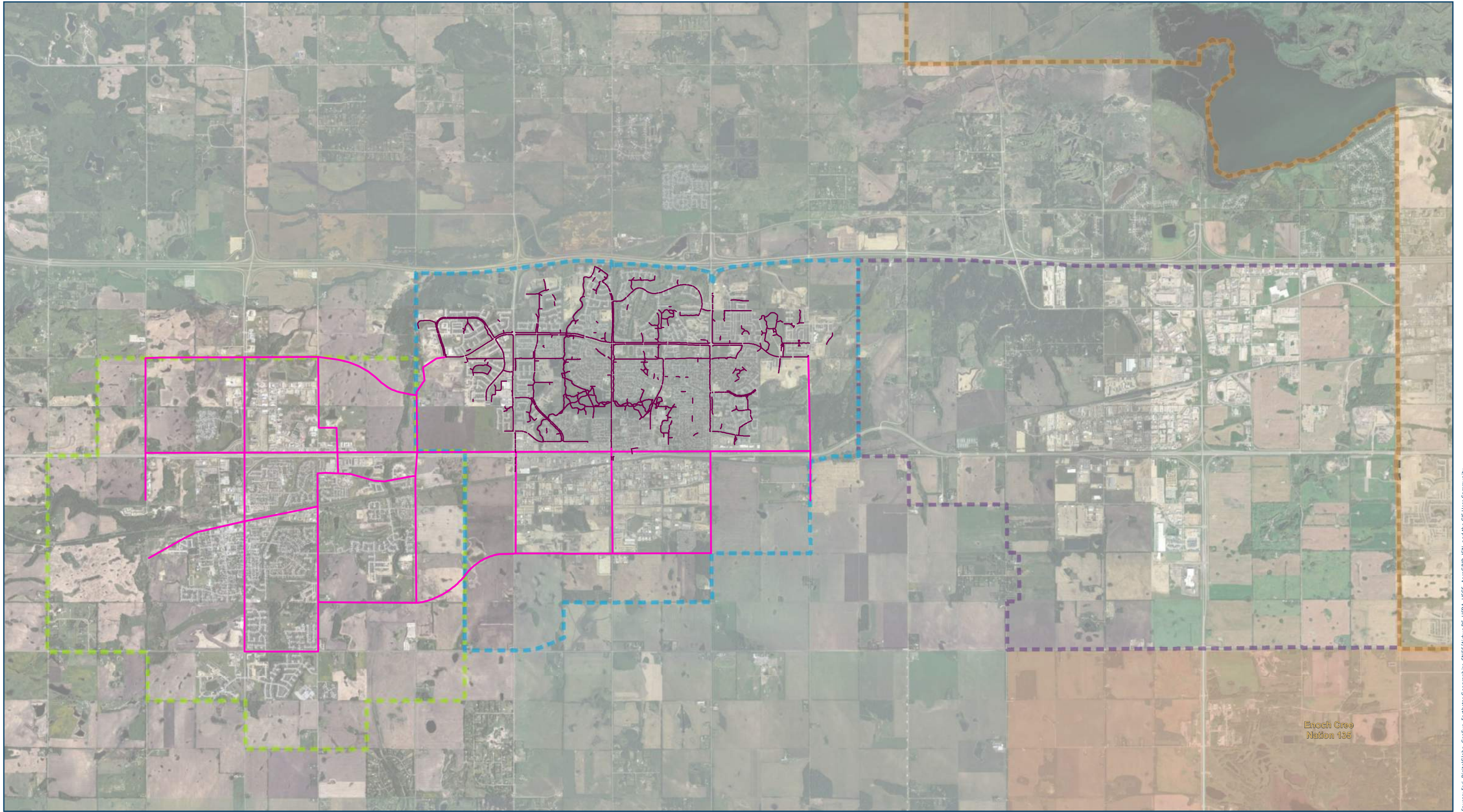
11.3.3 Park and Ride, Connection Points

Several park and ride locations planned in the RTSC and Tri-municipal Regional Plan will service all transit services. The locations of park and ride is roughly accurate based on the two plans and subject to further study. Several transit connection points are located within major employment areas and provide a hub connecting passengers between various transit services but no park and ride option.

11.4 Active Transportation

Active transportation plans include sidewalks, trails, multiuse paths and cycling facilities. Active transportation mode choice within the subject area is relatively low (0.8% cycling and 6.4% walking) however several transportation/land use policies consistent across the three municipalities, include aspirations for increasing active transportation modes share. The plans for active transportation are illustrated on **Figure 11.9**.

Date: 2021-03-25 Document: \\edms2\GIS\15739_Trans_Uilities_and_Infra_Strategy\02_CADD\25_GIS\051_Figures\15739_Land_Use_Plan_Transportation_210325.mxd



Enoch Cree
Nation 135

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

TRI-MUNICIPAL
REGIONAL PLAN

0

0.5

1

2

3

4

km

1:60,000

Coordinate System: CANA83-3TM114

- Tri-Municipal Plan
Prime Area of Focus
- Parkland County
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial
- First Nation

Walkway (Spruce Grove)Proposed Multi-Use Path

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY

FIGURE 11.9

FUTURE
ACTIVE TRANSPORTATION

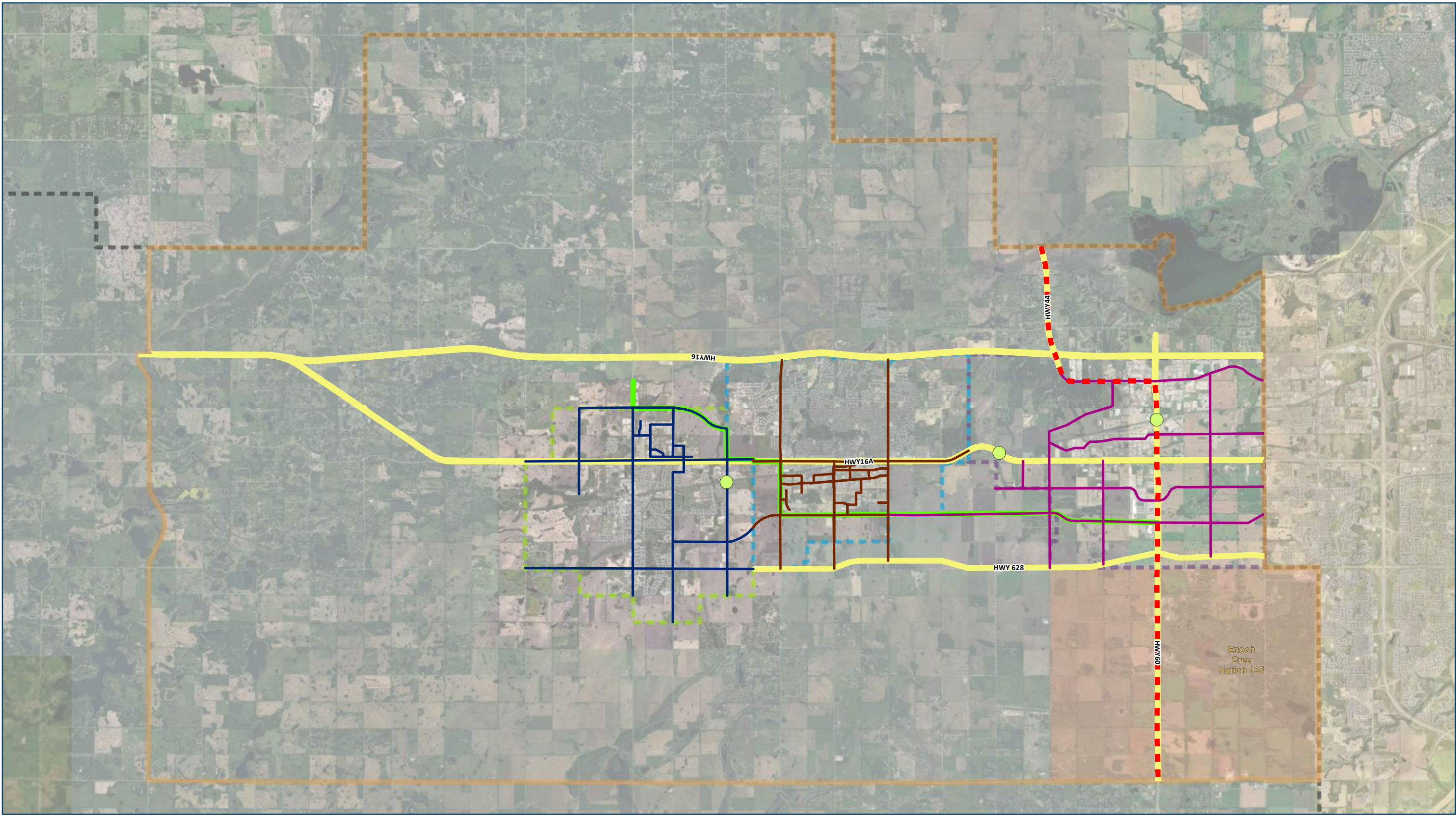
More details regarding specific plans are summarized as follows:

- ◆ **Multi-use Trails (Arterial Roads):** Arterial roads provide a multi-use trail on at least one side and provide high quality crossings at intersections. Alignments follow the arterial roadway network as existing Stony Plain arterial design standards include a multi-use path on both sides and existing Spruce Grove arterial include a multi-use path on one side.
- ◆ **Highway connections:** A multi-use path is recommended along Highway 16A to provide a route connecting to active transportation connections along arterial roadways. Construction of a multi-use trail along Highway 16A needs to be thoughtfully planned and consider a larger buffer/offset from the highway to improve comfort and safety of users and provide high quality crossing controls at intersections.
- ◆ **Cross border connections (Spruce Grove/Stony Plain):** Multi-use paths connect between Stony Plain and Spruce Grove along future east/west connections.
- ◆ **Active Transportation (Future Growth Areas):** Future growth areas need to provide a dense network of trails and sidewalks that expand on existing trails and sidewalks.
- ◆ **Acheson:** Existing and future roadway standards in Acheson are industrial/rural standard and exclude sidewalks and trails.
- ◆ **Staging:** Active transportation connections are created with the expansion of the urban arterial roadway network and follow the roadway stages as illustrated in Figures 11.2 to 11.7. Active transportation along Highway 16 A occurs within the 2021 to 2030 timeframe and functions as a spine to the active transportation network.

11.5 Goods Movement

Schematic transportation servicing is shown in **Figure 11.10** for goods movement. The servicing plans incorporate and expand on existing goods movements routes and more details regarding specific plans are summarized as follows:

- ◆ **Truck routes:** Expansion of truck routes following the arterial roadway system in Stony Plain and Spruce Grove. All roadways in Acheson are considered truck routes.
- ◆ **Long combination routes:** Highway 628 is added to the provincial long combination vehicle routes.
- ◆ **Oversize/Overweight corridor:** A tri-municipal oversize/overweight corridor connects industrial areas in Stony Plain and Spruce Grove to Acheson and the provincial high load corridor on Highway 60. The corridor connects through future industrial areas of Spruce Grove and follows the new east/west connection to Acheson, avoiding the CN crossing bridge on Highway 16A and the interchange bridge at Highway 16A/Highway 779 which are not expected to accommodate heavy vehicles. Additional improvements are needed along TWP Road 531A improvements for supporting the oversize/overweight loads, connecting between Highway 44 and Highway 60.
- ◆ **Rail:** Future industrial development needs for rail is subject to future study and need. As of the writing of this report it is not certain that rail spurs are required for servicing future industrial.
- ◆ **Staging:** Expansion of goods movement routes follow the roadway stages as illustrated in **Figures 11.2 to 11.7.**



11.6 Transportation Servicing Cost Estimates

Transportation servicing costs for roadways, active transportation, transit and goods movement servicing are provided in the following sections.

Detailed costs are provided in the Appendix B. All costs are in 2021 dollars.

11.6.1 Roadways

Detailed allocation of costs are as follows:

- ◆ **Alberta Transportation:** Cost for highway improvements are carried by Alberta Transportation and not included in the costs summary. Costs for arterial intersections with the highways are included in roadway costs and allocated as needed to the municipality.
- ◆ **Spruce Grove and Stony Plain:** Costs assume roadways in Spruce Grove and Stony Plain are first or second half of a four-lane divided urban arterial roads. Collector and local roadways as part of future growth areas are directly paid for by the benefiting growth area and not included in the roadway cost summary.
- ◆ **Parkland County - Acheson:** Costs for roadways in Acheson include arterials and collectors as identified in the Acheson/Big Lakes TIA. Costs for roadways in Acheson are based on the classifications and roadway standards outlined in the Acheson/Big Lakes TIA.
- ◆ **Intersections:** Arterial/arterial intersections are assumed to be signalized and costs are included in roadway costs summary, with specific locations outlined in Appendix B. Intersection geometry, including turn lanes and storage lanes at signalized intersection are accounted for roadway costs.
- ◆ **Cost Sharing:** Sharing of costs is subject to future negotiations, but for the purposes of this report only is assumed as follows.
 - ◆ Veterans Boulevard along the Stony Plain and Spruce Grove boundary, north of Highway 16A.
 - Shared 50/50 between Spruce Grove and Stony Plain.
 - ◆ 231 Street along the Parkland County (Acheson) and City of Edmonton boundary, south of Highway 16 to Highway 628
 - Shared 50/50 between Parkland County and City of Edmonton.
 - ◆ Future rail grade separated crossing on Veterans Boulevard
 - Shared 50/50 between Spruce Grove and Stony Plain.
- ◆ **Other:** Requirements for future road right of way, major utility relocations, major realignments (e.g. Bevington Road) and other site-specific considerations are subject to future study and not included in the cost summary.

Cost estimates for roadways are summarized in the following table:

Table 11.1: Cost Estimates (Roadways)

Roadway Costs	Costs (\$M)			
Municipality	2020/30	2030/40	2040/50	2050/60
Stony Plain	\$ 12.4	\$ 19.3	\$ 25.5*	\$ 15.3
Spruce Grove	\$ 18.9	\$ 18.1	\$ 30.5*	\$ 13.3
Acheson/Big Lake	\$ 32.8	\$ 32.6	\$ 38.1	\$ 13.0
Parkland Fifth Meridian	\$ -	\$ -	\$ 2.6	\$ -

*Includes \$10 M for rail grade separation.

11.6.2 Transit

As noted in the transit servicing section, transit routes are highly conceptual and intended only as a representative example of possible transit services within the subject area and subject to further study. Given the challenges to understand governance of transit and no available master plan for the area it is difficult to forecast costs. Detailed cost assumptions are outlined as follows. Costs for transit are shortfall operating costs, which is the difference between revenue (fares) and operating costs.

Tri-municipal Transit

Cost for Tri-municipal transit are provided in the Tri-municipal Regional Transit Plan report. Costs for short term (1 – 3 years) transit plans are approximately \$2.4 million per year. Cost for medium term (4 – 10 years) transit plans increase to approximately \$3.7 million per year. The costs provided to the 10-year period are extrapolated to 2060 based on population growth. For the purposes of this study costs are distributed 50% towards Spruce Grove and 25% towards Stony Plain and Acheson, but is subject to future review, discussions and ongoing negotiations.

RTSC (Regional) Transit

Costs for Regional Transit through the RTSC is based on the operating costs for regional transit services provided in the RTSC 2020 report and allocated to each member municipality. The 2020 report only provides costs between 2020 and 2026, therefore costs to 2060 are extrapolated based on population growth. According to the report, RTSC cost allocations to municipalities are based on services received through the RTSC. Annual cost for regional transit for Spruce Grove is \$1,171,000 based on the services planned. Spruce Grove is assigned a higher percentage based on receiving a larger proportion of routes and services in the area, compared to Stony Plain, with an annual cost of \$208,000. Over time the allocation of service to Stony Plain is assumed to increase and the amounts are adjusted to be closer to Spruce Grove values in cost summary. Capital costs for new park and rides, connection points and new buses are not included in the cost estimates by the RTSC. It should be noted that since the 2020 report was completed Parkland County is no longer taking part as a member of the RTSC and their portion of regional service costs are excluded in the cost summary.

Cost estimates for transit are summarized in the following table:

Table 11.2: Cost Estimates (Transit)

Transit Costs	Costs (\$M)			
Municipality	2020/30	2030/40	2040/50	2050/60
Stony Plain	\$12.4	\$19.0	\$22.7	\$26.5
Spruce Grove	\$28.0	\$36.0	\$43.1	\$50.2
Acheson/Big Lake	\$8.3	\$10.4	\$12.5	\$14.5
Parkland Fifth Meridian	\$ -	\$ -	\$ -	\$ -

It should be noted that the transit costs are subject to user cost recoveries and depend on ridership levels. For example, cost recovery estimate in the Tri-municipal Transit plan is approximately 20% of the total cost but this may increase with expansion and build out of the growth areas and expansion of the transit system. As ridership increases the costs for operating transit will be reduced.

11.6.3 Active Transportation

Active transportation costs are for installing a multi-use path along Highway 16A and a portion of Highway 628. Spruce Grove and Stony Plain arterial roadway standards include the construction of a multi-use path and the costs is included in the roadway cost estimates in the previous section. The costs are summarized in the following table:

Table 11.3: Cost Estimates (Active Transportation)

Active Transportation Costs	Costs (\$M)			
Municipality	2020/30	2030/40	2040/50	2050/60
Stony Plain	\$ 1.4	\$ -	\$ -	\$ -
Spruce Grove	\$ 1.9	\$ -	\$ -	\$ -
Acheson/Big Lake	\$ -	\$ -	\$ -	\$ -
Parkland Fifth Meridian	\$ -	\$ -	\$ -	\$ -

11.6.4 Goods Movement

Cost for goods movement is limited to installing rotatable bases on signal and sign structures at existing and future intersections to create a tri-municipal OSOW load corridor. The timing follows the completion of the east/west roadway between Spruce Grove and Acheson.

Table 11.4: Cost Estimates (Goods Movement)

Goods Movement Costs	Costs (\$M)			
Municipality	2020/30	2030/40	2040/50	2050/60
Stony Plain	\$ -	\$ 0.2	\$ -	\$ -
Spruce Grove	\$ -	\$ 0.2	\$ -	\$ -
Acheson/Big Lake	\$ -	\$ 0.2	\$ -	\$ -
Parkland Fifth Meridian	\$ -	\$ 0.1	\$ -	\$ -

12.0 CONCLUSIONS AND RECOMMENDATIONS

12.1 Study Synopsis

The subject report focuses on providing detailed transportation, utilities and infrastructure for servicing the preferred Tri-municipal Region land use plan based on reviewing existing systems, current plans and incorporating high-level servicing strategies.

- ◆ Transportation includes roadways, transit, active transportation and goods movement and considers local plans and implications from external influences including Alberta Transportation (AT), Edmonton Metropolitan Region Board (EMRB), CN Rail and the Edmonton Metropolitan Transit Services Commission (EMTSC).
- ◆ Utilities includes power transmission, power distribution, oil / gas pipelines, gas distribution, and telecommunications. These utilities typically do their own planning and engineering with little to no input from municipal governments.
- ◆ Infrastructure includes water, wastewater and stormwater and relies on detailed planning studies conducted on behalf of the municipalities and the local water and wastewater commissions.

A significant number of documents were reviewed in creating this plan and are outlined in their respective sections. The following conclusions and recommendations are outlined for each focus area based on the results of this study.

12.2 Conclusions

12.2.1 Water

Existing Water Systems

Conclusions made in reviewing existing water system outlined in Section 2.0 are as follows:

- ◆ Existing water systems are illustrated in Figures 2.1 to 2.4 and include supply from the CRPWSC and WILD commissions to existing municipal reservoirs where water is pumped to the separate municipal distribution systems through multiple pressure zones.
- ◆ The existing water systems are working well.

Current Plans

Water distribution system master plans are in place for Spruce Grove, Stony Plain and the Acheson / Big Lake part of Parkland County. These master plans include long term growth assumptions going beyond the 2060 growth assumed in the Preferred Land Use Plan. The current plans were developed independent from the other municipalities in the Region.

High-level Strategies

Detailed discussion of high-level strategies and action items are summarized in Section 7.0.

Detailed Water Servicing Plans

The following conclusions are drawn from the detailed water servicing plans:

- ◆ Future servicing plans are generally consistent with previously completed water master plans.
- ◆ Development of the Fifth Meridian ASP will require significant front-end costs including the construction of a new reservoir connected to the WILD transmission line.
- ◆ Additional or new reservoir capacity is required in 2040-2050 growth horizon for Stony Plain, Spruce Grove and Fifth Meridian ASP. It is technically feasible to connect the distribution systems and share some of the reservoir capacity, which would allow new reservoir capacity construction to be deferred in one or two of the municipalities / development areas.

12.2.2 Wastewater

Existing Wastewater Systems

The following conclusions are made based on the review of the existing wastewater system outlined in Section 3.0:

- ◆ The existing wastewater collection systems are illustrated in Figures 3.1 to 3.4 and include local municipal collection systems and wastewater transmission and treatment provided by the ACRWC.
- ◆ Spruce Grove and Stony Plain is serviced by gravity sewers and trunks, while Parkland County utilizes a combination of gravity sewers and lift stations / forcemains.
- ◆ The existing wastewater systems are working well.

Current Plans

Wastewater collection system master plans are in place for Spruce Grove, Stony Plain and the Acheson / Big Lake part of Parkland County. These master plans include long term growth assumptions going beyond the 2060 growth assumed in the Preferred Land Use Plan. The current plans were developed independent from the other municipalities in the Region and typically involve extensions to existing municipal trunk sewers. The ACRWC has plans in place to upgrade its transmission system to facilitate growth in the Region.

High-level Strategies

Detailed discussion of high-level strategies and action items are summarized in Section 7.0.

Detailed Wastewater Servicing Plans

The following conclusions are drawn from the detailed wastewater servicing plans:

- ◆ Future servicing plans are generally consistent with previously completed wastewater master plans.
- ◆ Development of the Fifth Meridian ASP will require a new lift station to be constructed near the ACRWC PSTS Trunk and the boundary with Spruce Grove.

- ◆ It is more efficient to service the portion of the Fifth Meridian ASP development along Highway 779 to the ACRWC trunk at Highway 779 in Stony Plain. This will require either a utility right-of-way for the County sewer within Stony Plain or the development of a shared sewer servicing both the County and the Town.

12.2.3 Stormwater

Existing Stormwater Systems

The following conclusions are made based on the review of the existing stormwater system outlined in Section 4.0:

- ◆ The existing stormwater collection systems are illustrated in Figures 4.1 to 4.4 and include local SWMF, storm sewers, ditches and natural creek systems that connect to Atim Creek and/or Big Lake.
- ◆ Spruce Grove and Stony Plain is serviced by gravity systems, while Parkland County utilizes a combination of gravity sewers, lift stations / forcemains, and ditches / creeks.
- ◆ The existing stormwater systems are generally working well. However the downstream ditches and creeks in Parkland County north of Highway 16 do have relatively high operating costs due to extended periods of flows following storm events.

Current Plans

Stormwater master plans are in place for Spruce Grove, Stony Plain and the Acheson / Big Lake part of Parkland County. These master plans include long term growth assumptions going beyond the 2060 growth assumed in the Preferred Land Use Plan. The current plans were developed independent from the other municipalities in the Region and typically involve extensions to existing municipal trunks and/or connections to existing ditches and creeks. Basin 1 of the Acheson / Big Lake area requires extensive stormwater pumping due to topographic constraints.

High-level Strategies

Detailed discussion of high-level strategies and action items are summarized in Section 7.0.

Detailed Stormwater Servicing Plans

The following conclusions are drawn from the detailed stormwater servicing plans:

- ◆ Future servicing plans are generally consistent with previously completed stormwater master plans.
- ◆ There are two locations where shared stormwater management infrastructure may be warranted as the storm drainage basin boundaries do not align with municipal boundaries:
 - ◆ The Fifth Meridian ASP along Highway 779 immediately north of Stony Plain.
 - ◆ Along the Spruce Grove / Stony Plain boundary south of Highway 16A.

12.2.4 Transportation

Conclusions include those made in reviewing existing transportation systems, current plans in Section 5.0 and high-level servicing strategies in Section 7.0 which were drafted prior to receiving the preferred land use plan. Additional conclusions include those made in providing the detailed servicing plans conducted after receiving the preferred land use land plan and outlined in Section 11.0. As such, conclusions are provided following the sections in which they were made.

Existing Transportation Systems

Conclusions made in reviewing existing transportation system outlined in Section 5.0 are as follows:

- ◆ **Roadways:** Existing roadways are illustrated in **Figure 5.1**. Review of existing roadways concludes the following:
 - ◆ Provincial roadways in the subject area are governed by Alberta Transportation (AT), except through the City of Spruce Grove.
 - ◆ AT classifies Highway 16 as a freeway, with access limited to interchange locations. Access to Highway 16 is provided to the area as follows:
 - Two interchanges connecting to Acheson (Highway 60 and Highway 44),
 - two interchanges connecting to Spruce Grove (Century Road and Jenifer Heil Road), and,
 - one interchange provides access to Stony Plain (Highway 779).
 - ◆ Highway 628 and 16A (except through Spruce Grove) are classified as multi-lane highways by AT, with access generally limited to public roads at 1,600 m spacing, and no direct development access permitted.
 - ◆ Highway 60 between Highway 16A and 16 at the CN railway tracks is a major concern in the subject area and to improve safety and traffic flow twinning and rail grade separation is needed.
 - ◆ Highway 628 requires consistent roadway surfacing to accommodate existing and future demands.
 - Upgrading this roadway would provide an alternate east/west regional connector that could carry diverted traffic from Highway 16 and Highway 16A.
 - ◆ Transportation networks within Spruce Grove, Stony Plain and Acheson are generally oriented north/south and connectivity between municipalities relies heavily on Highway 16, Highway 16A and Highway 628.
 - ◆ The north/south portions of the study area are bi-sected by the CN rail line and there is currently only one grade separate crossing within the entire study area (Highway 16A between Atim Road and Spruce Valley Road).
- ◆ **Transit:** Regional transit services are currently provided through Edmonton Transit Services (ETS). ETS route 560 travels between Spruce Grove and Edmonton, route 561 travels between Acheson and Edmonton and route 562 travels between Spruce Grove and Edmonton with a stop in Acheson. There is a cost sharing agreement in place between the City of Edmonton, Spruce Grove and Parkland County for funding ETS routes. Within Acheson, Parkland County has funded a shuttle service to travel within the five zones of the employment area, connecting between ETS transit stops on Route 561 and 562.

Passengers getting off ETS can board the shuttle and let the driver know where they need to go with the five zones. In the evening (for pickup) passengers need to pre-book the service. Existing transit is illustrated in **Figure 5.5**.

- ◆ **Active Transportation:** Arterial roadways in Spruce Grove and Stony Plain provide a multi-use trail and/or a sidewalk on both sides of the road, compared to Acheson roadways standards which provide surface stormwater management (ditches) and no sidewalk or multi-use trail. Operating traditional transit in Acheson complete with bus stops connecting with an active transportation network (sidewalks and trails) is not feasible with the existing roadway standard. As such, Acheson has been operating a transit shuttle providing door-to-door service. Existing active transportation networks are illustrated in **Figure 5.6**. There are no regional active transportation facilities connecting between the municipalities.
- ◆ **Goods Movement:** The Tri-Municipal area includes a number of areas with significant industrial and commercial development that depend on the transport of raw materials and finished products to internal and external markets. Generally, all provincial highways are designated as truck routes and dangerous goods route, unless designated otherwise by a municipality. Highway 16, Highway 16 A and Highway 44 (north of Highway 16) and Highway 60 are provincial long combination vehicle routes. Existing goods movement routes are illustrated in **Figure 5.7**.
- ◆ **EMRB:** EMRB administers the Integrated Regional Transportation Master Plan (IRTMP) which includes planning transportation systems for roads, transit, air, rail and active transportation within the Edmonton region. Parkland County, City of Spruce Grove and Town of Stony Plain are EMRB member municipalities. The 2011 IRTMP indicates varying classifications for some highways in the area with varying implications for access management. For example, Highway 16A is classified as an expressway by AT and requires 1,600 m spacing between access where the EMRB classified this as an arterial and requires 250 to 400 m spacing between accesses.

Current Plans

Conclusions made in reviewing current transportation plans as outlined in Section 5.0 are as follows:

- ◆ **Roadways:** Current plans for roadways are as follows:
 - ◆ Alberta Transportation has several projects for improving highways in the subject area which are at various levels of planning. Some highlights are:
 - Highway 16 widening (City of Edmonton to Highway 779),
 - Highway 60 twinning and rail grade separation (Highway 16 to Highway 16A),
 - Highway 628 improvements,
 - Highway 628 realignment, and
 - Upgrading (City of Edmonton to Highway 779 and others).
 - ◆ Spruce Grove completed their Transportation Master Plan in 2012, but are planning an update in the next couple years. Highlights of current plans in Spruce Grove include:
 - Their intentions to urbanize Campsite Road, Century Road and Golden Spike Road, south of Highway 16A.
 - Additional transportation improvement plans, including Grove Drive twinning and Pioneer Road improvements as indicated in their corporate plan (2020 – 2020).

- ◆ Parkland County has completed the Acheson/Big Lakes TIA which highlights roadway requirements for servicing growth in the area to 2047, including extension of roadways between Acheson, Spruce Grove and Stony Plain.
- ◆ Parkland County and Stony Plain are currently updating their Transportation Master Plans, which are expected to be finalized in 2021. Initial information from their master plans was not available at the time of this writing.
- ◆ **Transit:** The Tri-municipal Region Transit Plan (2018) provides plans for regional transit connecting between municipalities and local transit offered within municipalities over a 10-year period. The EMTSC conducted a business case in 2020 which evaluates the economics of integrating regional transit services offered by individual municipalities into a single regional transit system and concluded significant cost saving would be expected. Spruce Grove and Stony Plain are members of the RTSC and implementation of the RTSC is ongoing.
- ◆ **Active Transportation:** Stony Plain has completed an Active Transportation Strategy (2020) for supporting active transportation and their upcoming TMP is expected to apply and expand on the direction in the strategy. The Municipal Development Plans (MDP) from all three municipalities have several transportation and land use policies focused on increasing transit and active transportation mode.
- ◆ **Goods Movement:** AT completed a study in 2018 for taking a long term, holistic approach to updating Alberta's High Load Corridor network. Highway 60, Twp Rd 531A, and Highway 44, is the identified north/south Oversize/Overweight load corridor and will serve as a key strategic and economic corridor within the study area. The proposed overview size/overweight load corridor is provided in **Figure 5.9**.
- ◆ **EMRB:** The Edmonton Metropolitan Region Board is updating the Integrated Regional Transportation Master Plan which focuses on the transportation requirements for servicing the Regional Growth Plan. The study is expected to be finalized in 2022. Parkland County, City of Spruce Grove and Town of Stony Plain are EMRB member municipalities and are actively involved with the ongoing IRTMP update and annual review of regional transportation priorities. Highlights of priority projects recognized by the EMRB in their 2018 regional transportation priorities report include Highway 60 twinning (Highway 16 to Highway 16A), Highway 628 (Highway 60 to Highway 779), Highway 16 widening (Highway 779 to Anthony Henday Drive) and Spruce Grove Park and Ride.

Transportation High-level Strategies

Detailed discussion of high-level strategies and action items are summarized in Section 7.0.

Detailed Transportation Servicing Plans

Conclusions made based on the detailed transportation servicing plans are as follows:

- ◆ Generally, detailed transportation servicing plans from the noted sources in Section 11.1 are adopted and expanded on in this study where needed for servicing future growth areas and to align with strategic action items.
- ◆ Transportation plans are subject to change especially with several concurrent transportation studies including: Transportation Master Plan updates by Parkland County and Stony Plain and

the Integrated Regional Transportation Master Plan update by the Edmonton Metropolitan Region Board. Detailed transportation plans from these studies were not available at the time of this writing report. In addition, Spruce Grove indicated that their Transportation Master Plan is planned to be updated and their current version is no longer current.

- ◆ **Roadways:** Roadways for servicing the preferred land use plan are outlined in Figures 11.1 and 11.2 – 11.8 (staging). Roadway improvement project highlights include:
 - ◆ **Alberta Transportation:**
 - Highway 16 widening from four to six lanes (Highway 779 to Anthony Henday Drive),
 - Highway 16A widening from four to six lanes (Spruce Grove to Acheson) including widening of the CN rail crossing,
 - Implementation of Highway 628 realignment, ultimately improved to four lanes and six lanes, and,
 - Highway 60 twinning between Highway 16 and Highway 16A with rail grade separation and interchange construction at Highway 16A.
 - ◆ **Spruce Grove:** Build out of the transportation network as indicated in their off-site levies with expansion of the network to service growth areas as needed. Additional connections/improvements include:
 - A new east/west roadway to provide connectivity between Stony Plain and Acheson.
 - Extension of north/south roadway improvements to Highway 628.
 - ◆ **Stony Plain:** Build out of the transportation network as indicated in their off-site levies with expansion of the network to service growth areas as needed. Additional connections/improvements include:
 - A new east/west roadway to provide connectivity between Spruce Grove and Acheson.
 - ◆ **Parkland County - Fifth Meridian Business Park Area:**
 - Arterial roadway connecting between residential areas and future Stony Plain roadways
 - Future industrial is expected to gain direct access from Highway 779, with limited cross connectivity between industrial and residential land uses.
 - ◆ **Parkland County – Acheson/Big Lake:** Build out of the transportation network as indicated in the Acheson/Big Lake TIA with expansion of the network to service growth areas as needed and extension of an east/west roadway to Spruce Grove and Stony Plain.
- ◆ **Transit:** Detailed transit servicing plans are based on the RTSC and Tri-municipal Transit Plans offering transit between Spruce Grove, Stony Plain and Acheson, with local transit offered by the individual municipalities. The detailed plans attempt to combine and expand on current transit plans in order to service the growth areas to the 2060 horizon. As plans are still underway for rolling out transit services, the transit servicing plans are highly conceptual and intended as a representative example of how transit services may be delivered within the subject area and subject to further study.
 - ◆ Highlights of the transit plans include expansion of regional services to provide routes along Highway 628 and expansion of local connector and local core routes, connecting between Spruce Grove, Stony Plain and Acheson. Transit plans are illustrated in **Figure 11.8**.

- ◆ **Active Transportation:** Generally active transportation (trails and sidewalks) are provided along the arterial roadway network within Spruce Grove and Stony Plain, connecting into existing and future growth areas and between municipalities along east/west corridors. Connecting the two municipalities also requires a multi-use pathway along Highway 16A. Existing and future roadway standards in Acheson are industrial/rural standard and exclude sidewalks and trails. Active transportation plans are provided in **Figure 11.9**.
- ◆ **Goods Movement and Rail:** Municipal truck routes are expanded with expansion of the arterial roadway network. Highway 628 is added to the provincial long combination vehicle routes. A tri-municipal oversize/overweight corridor connects industrial areas in Stony Plain and Spruce Grove to Acheson and the provincial high load corridor on Highway 60. The corridor connects through future industrial areas of Spruce Grove and follows the new east/west connection to Acheson, avoiding the CN crossing bridge on Highway 16A and the interchange bridge at Highway 16A/Highway 779 which are not expected to accommodate heavy vehicles. Future industrial development needs for rail are subject to future study and need. As of the writing of this report it is not certain that rail spurs are required for servicing future industrial. Goods movement plans are provided in **Figure 11.10**.

12.2.5 Utilities

Existing Utilities Systems

Conclusions made in reviewing existing utilities systems outlined in Section 6.0 are as follows:

- ◆ Available utility mapping information is illustrated in **Figure 6.1 to 6.4**.
- ◆ Utility companies, though regulated, generally manage their own systems and do not share information relating to system capacities and long-term plans with municipalities.
- ◆ Lack of suitable broadband can be a constraint to economic development, and concurrent studies by others has indicated that this is an issue within the Tri-Municipal study area. The existing broadband network does not cover all existing developments and the 2019 internet speeds do not meet the CRTC targets.

Current Plans

Current plans were not available as utility companies were not willing to share their future plans. Expansion and upgrading is generally done in response to servicing needs resulting once development plans are established, and based on the utility's individual business model.

High-level Strategies

Detailed discussion of high-level strategies and action items are summarized in Section 7.0.

12.3 Recommendations

12.3.1 Water

Recommended water servicing plans are provided in Section 8.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal water system master plan.
- ◆ As additional reservoir capacity is projected in 2040-2050 growth horizon for Stony Plain and Fifth Meridian ASP, consider ways that potable water storage can be shared.

12.3.2 Wastewater

Recommended wastewater servicing plans are provided in Section 9.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal wastewater master plan.
- ◆ Develop options for servicing the Fifth Meridian ASP land along Highway 779 to the ACRWC through Stony Plain.

12.3.3 Stormwater

Recommended stormwater servicing plans are provided in Section 10.0. The following are the key recommendations:

- ◆ Consider developing a joint Tri-Municipal stormwater master plan.
- ◆ Consider developing shared stormwater management infrastructure where storm basin boundaries do not align with municipal boundaries.
- ◆ Develop a joint “Low Impact Development” (LID) Strategy

12.3.4 Transportation

Recommended transportation servicing plans are outlined in Section 11.0. In addition, the following are recommended:

- ◆ Coordinate with AT to downgrade the classification of Highway 16 A to allow direct access to future growth areas.
- ◆ Coordinate at a Tri-municipal level to manage the Highway 16 A corridor, including access planning and traffic operations.
- ◆ Coordinate with the EMRB and AT to pursue completion of highway improvement projects as noted in the detailed transportation servicing plans.
- ◆ Complete joint planning studies, including the following:
 - ◆ Tri-municipal Transportation Master Plan
 - ◆ Tri-municipal Transit Plan (update)
 - ◆ Tri-municipal Transit Plan Goods Movement Study

12.3.5 Utilities

The following recommendations are made specific to broadband:

- ◆ Stony Plain and Parkland County should also complete a Fibre Optic Broadband Strategy Study
- ◆ The Region should identify sources of funding for bringing broadband to rural areas.
- ◆ The Region should assess opportunities to implement partnering and/or incentivizing provision of broadband.

APPENDIX A
Detailed Water, Wastewater and Stormwater Servicing Costs

Table A.1: Detailed Water Cost Estimates

Location	Item	Unit	Unit Rate	2020/30 Costs		2030/40 Costs		2040/50 Costs		2050/60 Costs	
				Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)
Stony Plain	250 mm Water Main	m	867	1,178	1.0	1,149	1.0	486	0.4	996	0.9
	300 mm Water Main	m	961	2,717	2.6	5,157	5.0	2,803	2.7	10,249	9.8
	350 mm Water Main	m	1,071	0	0.0	652	0.7	0	0.0	693	0.7
	400 mm Water Main	m	1,224	0	0.0	0	0.0	0	0.0	0	0.0
	600 mm Water Main	m	1,794	0	0.0	0	0.0	0	0.0	0	0.0
	Dedicated Feed Line to High Park Reservoir (300 mm)	m	961	0	0.0	4,489	4.3	0	0.0	0	0.0
	Proposed West Reservoir	m ³	1,070	0	0.0	0	0.0	0	0.0	5,000	5.4
	TOTALS				3.6		11.0		3.1		16.8
Fifth Meridian ASP	300 mm Water Main	m	961	0	0.0	0	0.0	4,987	4.8	2,839	2.7
	Parkland Meridian Reservoir	m ³	1,070	0	0.0	0	0.0	6,512	7.0	0	0.0
	TOTALS				0.0		0.0		11.8		2.7
Spruce Grove	250 mm Water Main	m	867	2,639	2.3	5,569	4.8	6,544	5.7	2,783	2.4
	300 mm Water Main	m	961	4,409	4.2	7,386	7.1	4,436	4.3	3,611	3.5
	350 mm Water Main	m	1,071	0	0.0	0	0.0	0	0.0	0	0.0
	400 mm Water Main	m	1,224	1,666	2.0	3,022	3.7	266	0.3	365	0.4
	600 mm Water Main	m	1,794	0	0.0	0	0.0	0	0.0	0	0.0
	Zone 1 Reservoir Upsizing	m ³	763	0	0.0	0	0.0	0	0.0	0	0.0
	TOTALS				8.6		15.6		10.3		6.3
Acheson / Big Lake	250 mm Water Main	m	867	0	0.0	0	0.0	0	0.0	0	0.0
	300 mm Water Main	m	961	11,347	10.9	5,335	5.1	7,473	7.2	4,135	4.0
	350 mm Water Main	m	1,071	1,400	1.5	0	0.0	805	0.9	1,181	1.3
	400 mm Water Main	m	1,224	7,689	9.4	2,616	3.2	0	0.0	805	1.0
	600 mm Water Main	m	1,794	0	0.0	0	0.0	0	0.0	0	0.0
	Zone 4 Reservoir Upsizing	m ³	763	2,637	2.0	0	0.0	8,837	6.7	3,490	2.7
	Proposed West Acheson Reservoir	m ³	1,070	0	0.0	7,760	8.3	0	0.0	0	0.0
	TOTALS				23.8		16.6		14.8		8.9

Notes:

- Where possible, unit rates from levies were used. If there were gaps, cost estimates and unit rates from recent master plans were used.
- Water main unit rates were reduced by 15% to account for Engineering Costs.
- Proposed 2019 Water and Wastewater Master Plan proposes a minimum of 10,000 m³ for the ultimate West Reservoir to service the newly created West Pressure Zone. Based on the 40-year growth horizon, the storage requirement is 732 m³ which is too small to justify the construction of a new reservoir, thus, the recommended volume is 5,000 m³.
- Reservoir upgrades in Spruce Grove were assumed to be 5,000 m3 in order to promote cost-effective construction and provide redundancy beyond 2060.

Table A.2: Detailed Wastewater Cost Estimates

Location	Item	Unit	Unit Rate	2020/30 Costs		2030/40 Costs		2040/50 Costs		2050/60 Costs	
				Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)
Stony Plain	300 mm Sewer	m	815	335	0.3	1,299	1.1	1,282	1.0	1,152	0.9
	375 mm Sewer	m	840	264	0.2	250	0.2	242	0.2	1,168	1.0
	450 mm Sewer	m	870	-	0.0	302	0.3	-	0.0	-	0.0
	525 mm Sewer	m	920	1,226	1.1	986	0.9	-	0.0	735	0.7
	TOTALS				1.6		2.4		1.2		2.6
Fifth Meridian ASP	300 mm Sewer	m	815	0	0.0	0	0.0	821	0.7	-	0.0
	375 mm Sewer	m	840	0	0.0	0	0.0	135	0.1	752	0.6
	600 mm Sewer	m	1,010	0	0.0	0	0.0	3,262	3.3	-	0.0
	Parkland Meridian Lift Station (66.7 L/s) + FM	L/s	35,000	0	0.0	0	0.0	66.7	2.3	-	0.0
	TOTALS				0.0		0.0		6.4		0.6
Spruce Grove	300 mm Sewer	m	815	548	0.4	1,270	1.0	383	0.3	-	0.0
	375 mm Sewer	m	840	4,015	3.4	2,153	1.8	1,647	1.4	1,228	1.0
	525 mm Sewer	m	920	964	0.9	246	0.2	-	0.0	-	0.0
	TOTALS				4.7		3.1		1.7		1.0
Acheson / Big Lake	250 mm Sewer	m	800	-	0.0	-	0.0	1,307	1.0	-	0.0
	300 mm Sewer	m	815	4,308	3.5	2,482	2.0	-	0.0	-	0.0
	375 mm Sewer	m	840	2,397	2.0	304	0.3	984	0.8	-	0.0
	525 mm Sewer	m	920	1,662	1.5	981	0.9	394	0.4	-	0.0
	600 mm Sewer	m	1,010	797	0.8	-	0.0	243	0.2	-	0.0
	Interim LS & FM (30 L/s)	L/s	35,000	30.0	1.1	-	0.0	-	0.0	-	0.0
	LS#1 & FM (38 L/s)	#	1,724,000	1.0	1.7	-	0.0	-	0.0	-	0.0
	LS#5 & FM (58 L/s) + LS#1 Upgrades (96 L/s)	#	3,679,000	-	0.0	1.0	3.7	-	0.0	-	0.0
	LS#2 & FM (22.5 L/s)	L/s	35,000	-	0.0	22.5	0.8	-	0.0	-	0.0
	LS#3 & FM (72.7 L/s)	#	2,004,001	-	0.0	1.0	2.0	-	0.0	-	0.0
	LS#4 & FM (84 L/s)	#	1,438,000	-	0.0	1.0	1.4	-	0.0	-	0.0
	LS#6 & FM (47 L/s)	#	1,512,000	-	0.0	-	0.0	1.0	1.5	-	0.0
	Zone 5 LS Expansion (+215 L/s)	L/s	35,000	-	0.0	-	0.0	215.0	7.5	-	0.0
	LS#7 & FM (27 L/s)	L/s	35,000	-	0.0	-	0.0	-	0.0	27.0	0.9
	LS#8 & FM (22 L/s)	#	1,384,000	-	0.0	-	0.0	1.0	1.4	-	0.0
	LS#9 & FM (24 L/s)	#	1,288,000	-	0.0	-	0.0	1.0	1.3	-	0.0
	LS#10 & FM (50 L/s)	#	1,512,000	-	0.0	-	0.0	-	0.0	1.0	1.5
	LS#12 & FM (50 L/s)	#	1,708,000	-	0.0	-	0.0	1.0	1.7	-	0.0
	LS#13 & FM (50 L/s)	#	1,561,000	-	0.0	-	0.0	1.0	1.6	-	0.0
	TOTALS				10.6		11.1		17.5		2.5

Notes:

1. Unit rates from the Stony Plain Levy were used where Spruce Grove / Acheson values were unavailable.
2. Unit rates for 250 mm and 300 mm sewers were extrapolated from levy information.
3. Several of the proposed lift stations in Acheson had cost estimates presented in the levy.
4. Where cost estimates weren't available, an average cost per unit L/s of capacity was used for wastewater and stormwater pump stations. This average came out to be approximately \$35,000 per L/s of station capacity.

Table A.3: Detailed Stormwater Cost Estimates

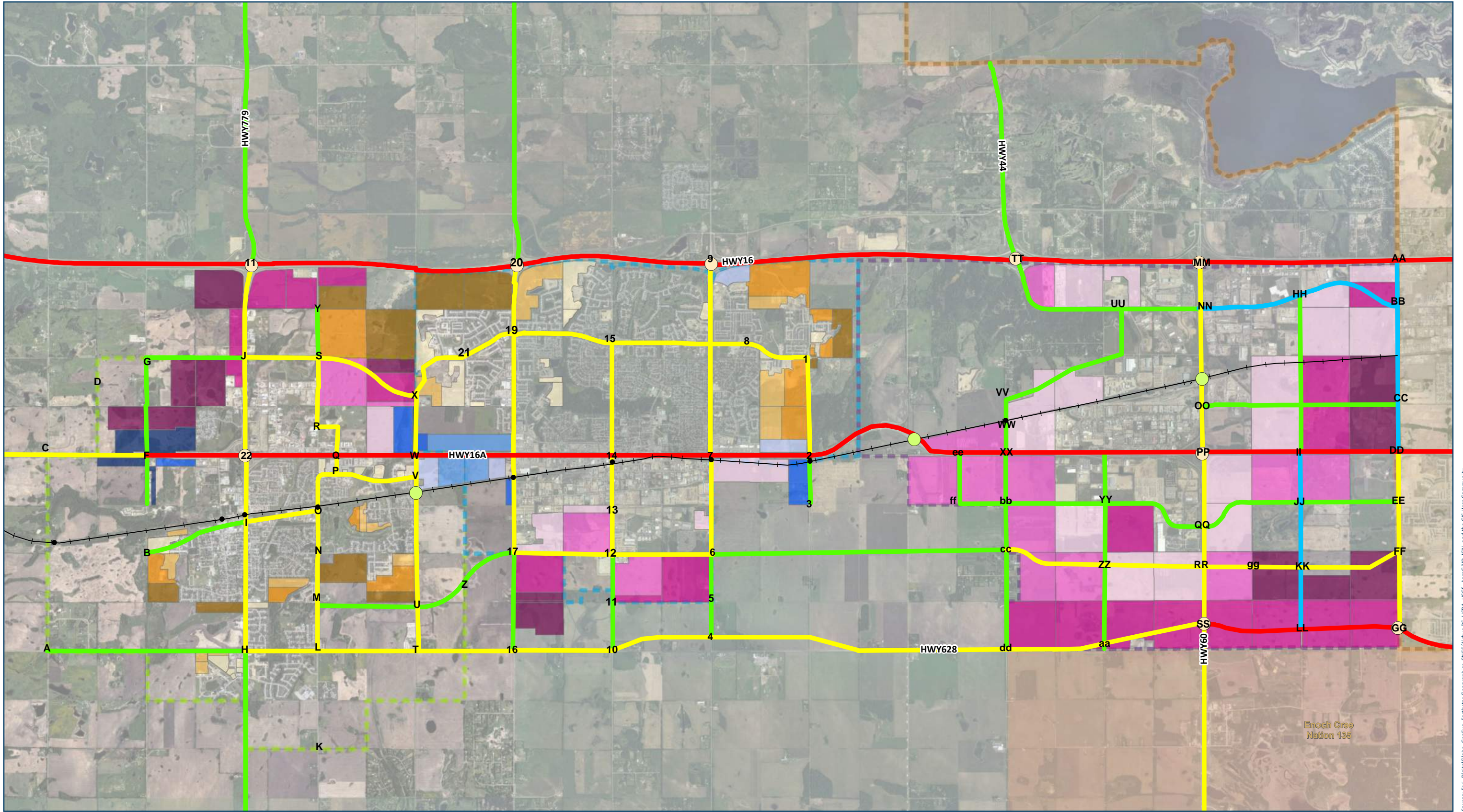
Location	Item	Unit	Unit Rate	2020/30 Costs		2030/40 Costs		2040/50 Costs		2050/60 Costs	
				Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)	Quantity	Cost (\$M)
Stony Plain	300 mm Sewer	m	815	284	0.2	-	0.0	450	0.4	1,796	1.5
	375 mm Sewer	m	840	819	0.7	-	0.0	976	0.8	-	0.0
	450 mm Sewer	m	870	913	0.8	512	0.4	292	0.3	1,412	1.2
	750 mm Sewer	m	1,170	-	0.0	-	0.0	471	0.6	284	0.3
	TOTALS				1.7		0.4		2.0		3.0
Fifth Meridian ASP	600 mm Sewer	m	800	-	0.0	-	0.0	515	0.4	-	0.0
	TOTALS				0.0		0.0		0.4		0.0
Spruce Grove	300 mm Sewer	m	815	953	0.8	-	0.0	232	0.2	-	0.0
	375 mm Sewer	m	840	344	0.3	1,071	0.9	-	0.0	156	0.1
	450 mm Sewer	m	870	1,469	1.3	1,573	1.4	602	0.5	186	0.2
	525 mm Sewer	m	920	-	0.0	396	0.4	-	0.0	-	0.0
	600 mm Sewer	m	1,010	719	0.7	-	0.0	-	0.0	-	0.0
	750 mm Sewer	m	1,170	-	0.0	175	0.2	-	0.0	-	0.0
	900 mm Sewer	m	1,490	2,178	2.2	-	0.0	-	0.0	-	0.0
	TOTALS				5.3		2.8		0.7		0.3
Acheson / Big Lake	300 mm Sewer	m	815	-	0.0	845	0.7	460	0.4	-	0.0
	375 mm Sewer	m	840	405	0.3	-	0.0	-	0.0	-	0.0
	450 mm Sewer	m	870	1,063	0.9	646	0.6	-	0.0	-	0.0
	525 mm Sewer	m	920	-	0.0	1,066	1.0	-	0.0	-	0.0
	600 mm Sewer	m	1,010	2,785	2.8	1,457	1.5	-	0.0	1,800	1.8
	675 mm Sewer	m	1,130	1,116	1.3	-	0.0	-	0.0	-	0.0
	200 mm Forcemain	m	800	-	0.0	-	0.0	1,238	1.0	-	0.0
	250 mm Forcemain	m	880	-	0.0	-	0.0	698	0.6	-	0.0
	300 mm Forcemain	m	850	-	0.0	942	0.8	-	0.0	-	0.0
	350 mm Forcemain	m	900	-	0.0	498	0.4	365	0.3	-	0.0
	400 mm Forcemain	m	925	-	0.0	-	0.0	443	0.4	-	0.0
	450 mm Forcemain	m	950	-	0.0	-	0.0	741	0.7	-	0.0
	500 mm Forcemain	m	1,000	1,543	1.5	1,268	1.3	-	0.0	-	0.0
	PS1-1 (38.8 L/s) + FM	L/s	35,000	-	0.0	38.8	1.4	-	0.0	-	0.0
	PS1-2 (38.8 L/s) + FM	L/s	35,000	-	0.0	38.8	1.4	-	0.0	-	0.0
	PS1-3 (39.5 L/s) + FM	L/s	35,000	-	0.0	39.5	1.4	-	0.0	-	0.0
	PS1-4 (38 L/s) + FM	L/s	35,000	-	0.0	-	0.0	38.0	1.3	-	0.0
	PS1-6 (38.8 L/s) + FM	L/s	35,000	-	0.0	38.8	1.4	-	0.0	-	0.0
	PS1-7 (78.2 L/s) + FM	L/s	35,000	-	0.0	-	0.0	78.2	2.7	-	0.0
	PS1-9 (38.8 L/s) + FM	L/s	35,000	-	0.0	-	0.0	38.8	1.4	-	0.0
	PS1-10 (76.7 L/s) + FM	L/s	35,000	76.7	2.7	-	0.0	-	0.0	-	0.0
	PS1-13 (38.2 L/s) + FM	L/s	35,000	-	0.0	-	0.0	38.2	1.3	-	0.0
	PS1-15 (66.3 L/s) + FM	L/s	35,000	66.3	2.3	-	0.0	-	0.0	-	0.0
	PS1-16 (34.1 L/s) + FM	L/s	35,000	-	0.0	34.1	1.2	-	0.0	-	0.0
	PS1-17 (40.9 L/s) + FM	L/s	35,000	40.9	1.4	-	0.0	-	0.0	-	0.0
	PS1-18 (36.9 L/s) + FM	L/s	35,000	-	0.0	36.9	1.3	-	0.0	-	0.0
	PS1-19 (34.1 L/s) + FM	L/s	35,000	-	0.0	-	0.0	-	0.0	34.1	1.2
	PS1-20 (32.0 L/s) + FM	L/s	35,000	-	0.0	-	0.0	32.0	1.1	-	0.0
	PS1-21 (37.7 L/s) + FM	L/s	35,000	-	0.0	37.7	1.3	-	0.0	-	0.0
	PS1-25 (20.8 L/s) + FM	L/s	35,000	-	0.0	-	0.0	20.8	0.7	-	0.0
	PS1-27 (39.2 L/s) + FM	L/s	35,000	-	0.0	-	0.0	-	0.0	39.2	1.4
	PS1-28 (20.9 L/s) + FM	L/s	35,000	-	0.0	-	0.0	20.9	0.7	-	0.0
	TOTALS				13.3		15.5		12.8		4.4

Notes:

1. Pump station cost estimates include the first branch of forcemain.
2. Stormwater forcemain unit rates from Acheson / Big Lake Basin 1 Stormwater Summary Report, 2018.

APPENDIX B
Detailed Transportation Servicing Costs

Document: \\edms2\GIS\15739_Trans_Uilities_and_Infra_Strategy\02_CADD\25_GIS\051_Figures\15739_Land_Use_Plan_Transportation_210218.mxd
Date: 2021-02-18



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

TRI-MUNICIPAL
REGIONAL PLAN

1:60,000

0 0.5 1 2 3 4 km

Coordinate System: CANA83-3TM114

- Tri-Municipal Plan Prime Area of Focus
- Parkland County
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial Area
- First Nation

- Railway
- Rail Crossing
- Interchange
- Rail Grade Separation

- Preferred Land Use Scenario
- C-2020/30
 - C-2030/40
 - C-2040/50
 - C-2050/60
 - I-2020/30

- I-2030/40
- I-2040/50
- I-2050/60
- R-2020/30
- R-2030/40
- R-2040/50
- R-2050/60

- 2 Lanes
- 3 Lanes
- 4 Lanes
- 6 Lanes

TRI-MUNICIPAL TRANSPORTATION, UTILITIES
AND INFRASTRUCTURE STRATEGY
Appendix B: Node References for the
Detailed Roadway Cost Estimates

Appendix B.1 Stony Plain Roadway Cost Estimates

East/West Roadways								Notes
From	To	Length	Existing	2030	2040	2050	2060	
A	H	3250.00	2LAR	-	-	-	-	
B	I	800.00	0 L	-	2LUA (100%) [G]	-	-	
D	G	0.00	0 L	-	-	-	-	
G	J	1600.00	0 L	-	-	2LUA (50%) [J]	2LUA (50%) [J]	
I	O	1220.00	2 LUA	-	-	4LUA (100%) [I]	-	Not in levy
J	S	1210.00	0 L	2LUA (100%) [J]			4LUA (100%) [J]	
M	U	1600.00	0 L	2LUA (100%) [U]			-	
P	V	1130.00	2 LUA	4LUA (50%) [P]	4LUA (50%) [P]	-	-	Not in levy
S	X	1770.00	0 L	-	2LUA (100%) [S]	-	4LUA (100%) [S]	Not in levy
U	Z	900.00	0 L	-	2LUA (100%) [U]	-	-	Not in levy
North/South Roadways								
A	B	1460	2LAR	-	-	-	-	`
B	C	1740	2LAR	-	-	-	-	
E	F		2LAR	-	-	-	-	
F	G	1450	2LAR	-	-	2LUA (50%) [F]	2LUA (50%) [F]	
K	L	1600	2LAR	-	-	-	-	
L	M	800	2LUA	-	-	4LUA (100%) [M]	-	Not in Levy
M	N	800	2LUA	-	4LUA (100%) [M]	-	-	Not in Levy
N	O	690	4LUA				-	Completed
O	P	610	4LUA				-	Completed
P	Q	440	4LUA				-	Completed
Q	R	750	2LUA	-	-	4LUA (100%) [R]	-	
R	S	1170	2LUR	-	2LUA (90%) [S]	-	4LUA (100%) [S]	
T	U	800	2LUR	-	-	4LUA (100%) [V]	-	
U	V	1000	2LUA	-	4LUA (50%) [U]	-	-	Length reflects existing four lanes
V	W	330	4LAU	-	-	-	-	Completed
W	X	1000	2LAR	2LUA (100%) [W]	-	4LUA (100%) [W]	-	Shared with Spruce Grove

Notes:

1. Roadway type (% completed in the horizon) [starting point for work]

Roadway Types	
2 Lane Rural	2LAR
2 Lane Urban	2LUA
4 Lane Urban	4LUA
4 Lane Highway	4LHWY

Singal Timing						
	Existing	10	20	30	40	Notes
F	Unsignalized Signals	-	-	-	Signal	
J	No intersection	-	-	-	Signal	On proposed high load corridor
L	Singal	-	-	-	-	
M	No intersection	-	-	-	Signal	
N	No intersection	-	-	-	-	
P	Signal	-	-	-	-	
Q	Signal	-	-	-	-	
S	No intersection	-	-	Signal	-	On proposed high load corridor
T	Unsignalized	-	-	Signal	-	
U	No intersection	-	-	Signal	-	
V	Unsignalized	Signal	-	-	-	
W	Unsignalized	-	Signal	-	-	
X	No intersection	-	-	Signal	-	On proposed high load corridor

East/West Roadways Cost					
From	To	10	20	30	40
A	H	-	-	-	-
B	I	-	\$ 2,600,000	-	-
D	G	-	-	-	-
G	J	-	-	\$ 2,600,000	\$ 2,600,000
I	O	-	-	\$ 2,745,000	-
J	S	\$ 3,932,500	-	-	\$ 2,722,500
M	U	\$ 5,200,000	-	-	-
P	V	\$ 1,271,250	\$ 1,271,250	-	-
S	X	-	\$ 5,752,500	-	\$ 3,982,500
U	Z	-	\$ 2,925,000	-	-

North/South Roadways Cost					
A	B	-	-	-	-
B	C	-	-	-	-
E	F	-	-	-	-
F	G	-	-	\$ 2,356,250	\$ 2,356,250
K	L	-	-	-	-
L	M	-	-	\$ 1,800,000	-
M	N	-	\$ 1,800,000	-	-
N	O	-	-	-	-
O	P	-	-	-	-
P	Q	-	-	-	-
Q	R	-	-	\$ 1,687,500	-
R	S	-	\$ 3,422,250	-	\$ 2,632,500
T	U	-	-	\$ 1,800,000	-
U	V	-	\$ 1,125,000	-	-
V	W	-	-	-	-
W	X	\$ 3,250,000	-	\$ 2,250,000	-
Total Roads		\$ 12,028,750	\$ 18,896,000	\$ 14,113,750	\$ 14,293,750
Total Signals		\$ 350,000	\$ 350,000	\$ 1,400,000	\$ 1,050,000
Total Cost		\$ 12,378,750	\$ 19,246,000	\$ 15,513,750	\$ 15,343,750

Improvement Costs		
From	To	Unit Rate
0 L	2LUA	3250
2LAR	2LUA	3250
2LUA	4LUA	2250

Appendix B.2 Spruce Grove Roadway Cost Estimates

East/West Roadways								Notes
From	To	Length	Existing	2030	2040	2050	2060	
X	21	1050	2LUA	2LUA (50%) [21]	-	4LUA (100%) [21]	-	Only 50%in 2030
21	19		4LUA	-	-	-	-	Completed
19	15		4LUA	-	-	-	-	Completed
15	8		4LUA	-	-	-	-	Completed
8	1	1140		-	4LUA (100%) [8]	-	-	
W	18		6LHWY	-	-	-	-	Completed
18	14		6LHWY	-	-	-	-	Completed
14	7		6LHWY	-	-	-	-	Completed
7	2	1600	4LHWY	-	6LHWY (100%) [7]	-	-	
Z	17	930	0 L	-	2LUA (100%) [17]	-	-	
17	12	1600	0 L	2LUA (100%) [17]	-	-	4LUA (100%) [17]	
12	6	1600	0 L		2LUA (100%) [12]	4LUA (50%) [12]	4LUA (50%) [12]	
North/South Roadways								
1	2	1600	2LAU	-	-	4LUA (100%) [2]	-	
2	3	800	2LAR	-	-	2LUA (100%) [2]	-	This is ultimately 4LAU in the OSL
9	7		4LUA	-	-	-	-	Completed
7	6	1600	2LAR	2LUA (100%) [7]	4LUA (50%) [7]	4LUA (50%) [7]	-	
6	5	800	2LAR	-	-	2LUA (100%) [6]	-	30% cost reduction, assumed lower standard
5	4	600	2LAR	-	-	2LUA (100%) [5]	-	30% cost reduction, assumed lower standard
15	14		4LUA	-	-	-	-	Completed
14	13		4LUA	-	-	-	-	Completed
13	12	800	2LAR	2LUA (100%) [13]		4LUA (100%) [13]	-	
12	11	800	2LAR	-	-	-	2LUA (100%) [11]	30% cost reduction, assumed lower standard
11	10	600	2LAR	-	-	-	2LUA (100%) [11]	30% cost reduction, assumed lower standard
20	19		4LUA	-	-	-	-	Completed
19	18		4LUA	-	-	-	-	
18	17	670	2LAR	2LUA (100%) [18]	-	4LUA (100%) [18]	-	
17	16	1600	2LAR	-	-	-	2LUA (100%) [17]	30% cost reduction, assumed lower standard

Notes:
1. Roadway type (% completed in the horizon) [starting point for work]

Roadway Types	
2 Lane Rural	2LAR
2 Lane Urban	2LUA
4 Lane Urban	4LUA
4 Lane Highway	4LHWY
6 Lane Highway	6LHWY

Signal Timing						
	Existing	10	20	30	40	Notes
1	Roundabout					
2	Unsignalized	Signal				
4	Unsignalized				Signal	
6	No intersection			Signal		On proposed high load corridor
10	Unsignalized				Signal	
12	Unsignalized		Signal			On proposed high load corridor
16	Unsignalized				Signal	
17	No intersection			Signal		On proposed high load corridor

Cost					
From	To	10	20	30	40
X	21	\$ 1,706,250	-	\$ 2,362,500	-
21	19	-	-	-	-
19	15	-	-	-	-
15	8	-	-	-	-
8	1	-	\$ 2,565,000	-	-
W	18	-	-	-	-
18	14	-	-	-	-
14	7	-	-	-	-
7	2	-	\$ 5,200,000	-	-
Z	17	-	\$ 3,022,500	-	-
17	12	\$ 5,200,000	-	-	\$ 3,600,000
12	6	-	\$ 5,200,000	\$ 1,800,000	\$ 1,800,000

Costs					
1	2	-	-	\$ 3,600,000	-
2	3	-	-	\$ 2,600,000	-
9	7	-	-	-	-
7	6	\$ 5,200,000	\$ 1,800,000	\$ 1,800,000	-
6	5	-	-	\$ 1,820,000.0	-
5	4	-	-	\$ 1,365,000.0	-
15	14	-	-	-	-
14	13	-	-	-	-
13	12	\$ 2,600,000	-	\$ 1,800,000	-
12	11	-	-	-	\$ 1,820,000.0
11	10	-	-	-	\$ 1,365,000.0
20	19	-	-	-	-
19	18	-	-	-	-
18	17	\$ 2,177,500	-	\$ 1,507,500	-
17	16	-	-	-	\$ 3,640,000.0
Total Roads		\$ 18,508,750	\$ 17,787,500	\$ 19,780,000	\$ 12,225,000
Total Signals		\$ 350,000	\$ 350,000	\$ 700,000	\$ 1,050,000
Total Cost		\$ 18,858,750	\$ 18,137,500	\$ 20,480,000	\$ 13,275,000

Improvement Costs		
From	To	Unit Rate
0 L	2LUA	3250
2LAR	2LUA	3250
2LUA	4LUA	2250
4LHWY	6LHWY	3250

Appendix B.3 Acheson and 5th Meridian Roadway Cost Estimates

North/South Roads								Notes
From	To	Length	Existing	2030	2040	2050	2060	
AA	BB	800	2LAR	3LUA (100%) [AA]	-	-	-	Shared with City of Edmonton
BB	CC	1600	2LAR	3LUA (100%) [BB]	-	-	-	Shared with City of Edmonton
CC	DD	800	2LAR	3LUA (100%) [CC]	-	-	-	Shared with City of Edmonton
DD	EE	800	2LAR	2LUA (100%) [DD]	-	4LUA (100%) [DD]	-	Shared with City of Edmonton
EE	FF	800	2LAR	2LUA (100%) [DD]	-	4LUA (100%) [EE]	-	Shared with City of Edmonton
FF	GG	1360	2LAR	2LUA (100%) [GG]	-	4LUA (100%) [GG]	-	Shared with City of Edmonton
HH	II	2470	2LRC	-	-	2LIC (100%) [HH]	-	Exists a gravel (length excludes portion complete)
II	JJ	800	2LAR	-	3LUA (100%) [JJ]	-	-	Realignment costs not included
JJ	KK	1060	2LAR	-	-	3LUA (100%) [JJ]	-	
KK	LL	1030	2LAR	-	-	3LUA (100%) [KK]	-	
UU	VV	2790	0 L	2LIA (50%) [VV]	2LIA (50%) [VV]	-	-	
VV	WW	470	2LRC	2LIA (100%) [VV]	-	-	-	
WW	XX	370	2LRC	2LIA (100%) [WW]	-	-	-	
hh	YY	800	2LIC	-	-	-	-	Completed
YY	ZZ	1020	2LRC	-	-	2LIC (100%) [ZZ]	-	
ZZ	aa	1220	2LRC	-	-	2LIC (100%) [ZZ]	-	
XX	bb	800	2LRC	-	2LIC (100%) [XX]	-	-	
bb	cc	800	2LRC	-	2LIC (100%) [bb]	-	-	
cc	dd	1600	2LRC	-	-	-	2LIC (100%) [cc]	
ee	ff	800	0L	-	2LIC (100%) [ee]	-	-	
East/West Roads								
TT	UU	1230	2LIA	-	-	-	-	
UU	NN	1300	2LIA	-	-	-	-	
NN	HH	1620	2LIC	3LIC (100%) [NN]	-	-	-	
HH	BB	1710	2LIC	3LIC (100%) [NN]	-	-	-	
WW	OO		2LIC	-	-	-	-	
OO	CC	3200	0L	2LIC (50%) [OO]	-	2LIC (50%) [OO]	-	
ff	bb	1600	0L	-	2LIC (100%) [ff]	-	-	
bb	YY	800	2LIC	-	2LIC (50%) [bb]	-	-	(ONLY 50% BUILT)
YY	QQ	1720	2LIC	-	-	-	-	
QQ	JJ	1770	0L	2LIC (50%) [QQ]	2LIC (50%) [QQ]	-	-	
JJ	EE	1600	0L		2LIC (100%) [FF]	-	-	
cc	ZZ	1630	0L		3LIA (100%) [ZZ]	-	4LIA (100%) [ZZ]	
ZZ	RR	1600	0L	3LIA (100%) [ZZ]	-		4LIA (100%) [ZZ]	
RR	gg	800	0L	-	3LIA (100%) [RR]	-	4LIA (100%) [RR]	
gg	KK	800	0L	-	-	3LIA (100%) [gg]	4LIA (100%) [gg]	
KK	FF	1670	0L	-	-	3LIA (100%) [FF]	4LIA (100%) [FF]	
S	Y	800	0L	-	2LUA (100%) [S]	-	-	Fifth Meridian ASP

Notes:

1. Roadway type (% completed in the horizon) [starting point for work]

Roadway Costs		
2 Lane Collector Rural	2LRC	Unimproved, but future collector alignment.
2 Lane Arterial Rural	2LAR	Unimproved, but future arterial alignment.
2 Lane Arterial Urban	2LUA	
2 Lane Industrial Collector	2LIC	
3 Lane Urban Arterial	3LUA	Two lanes with TWLTL
3 Lane Industrial Arterial	3LIA	Two lanes with TWLTL
4 Lane Industrial Arterial	4LIA	Divided arterial

Signal Timing						
Intersection	Existing	10	20	30	40	Notes
BB	Unsignalized	Signal	-	-	-	
DD	Unsignalized	Signal	-	-	-	
II	Unsignalized	Signal	-	-	-	
KK	No intersection	-	-	Signal	-	On proposed high load corridor
NN	Signalized	-	-	-	-	
UU	Unsignalized	-	-	Signal	-	
XX	Unsignalized	Signal	-	-	-	
aa	Unsignalized	-	-	-	-	
cc	No intersection	-	-	Signal	-	On proposed high load corridor
dd	Unsignalized	-	Signal	-	-	
ee	Unsignalized	-	Signal	-	-	

Cost					
From	To	10	20	30	40
AA	BB	\$ 3,880,000	-	-	-
BB	CC	\$ 7,760,000	-	-	-
CC	DD	\$ 3,880,000	-	-	-
DD	EE	\$ 2,600,000	-	\$ 2,600,000	-
EE	FF	\$ 2,600,000	-	\$ 2,600,000	-
FF	GG	\$ 4,420,000	-	\$ 4,420,000	-
HH	II	-	-	\$ 4,940,000	-
II	JJ	-	\$ 3,880,000	-	-
JJ	KK	-	-	\$ 5,141,000	-
KK	LL	-	-	\$ 4,995,500	-
UU	VV	\$ 3,348,000	\$ 3,348,000	-	-
VV	WW	\$ 940,000	-	-	-
WW	XX	\$ 740,000	-	-	-
hh	YY	-	-	-	-
YY	ZZ	-	-	\$ 2,040,000	-
ZZ	aa	-	-	\$ 2,440,000	-
XX	bb	-	\$ 1,600,000	-	-
bb	cc	-	\$ 1,600,000	-	-
cc	dd	-	-	-	\$ 3,200,000
ee	ff	-	\$ 1,920,000	-	-
Costs					
TT	UU	-	-	-	-
UU	NN	-	-	-	-
NN	HH	\$ 1,944,000	-	-	-
HH	BB	\$ 2,052,000	-	-	-
WW	OO	-	-	-	-
OO	CC	\$ 3,840,000	-	\$ 3,840,000	-
ff	bb	-	\$ 3,840,000	-	-
bb	YY	-	\$ 960,000	-	-
YY	QQ	-	-	-	-
QQ	JJ	\$ 2,124,000	\$ 2,124,000	-	-
JJ	EE	-	\$ 3,840,000	-	-
cc	ZZ	-	\$ 5,868,000	-	\$ 3,912,000
ZZ	RR	\$ 3,840,000	-	-	\$ 1,920,000
RR	gg	-	\$ 2,880,000	-	\$ 960,000
gg	KK	-	-	\$ 2,880,000	\$ 960,000
KK	FF	-	-	\$ 6,012,000	\$ 2,004,000
S	Y	-	\$ 2,600,000	-	-
Total Acheson Roads		\$ 31,398,000	\$ 31,860,000	\$ 37,098,500	\$ 12,956,000
Total Acheson Signals		\$ 1,400,000	\$ 700,000	\$ 1,050,000	\$ -
Total Acheson Costs		\$ 32,798,000	\$ 32,560,000	\$ 38,148,500	\$ 12,956,000
Total Fifth Meridian ASP Costs		-	\$ 2,600,000	-	-

Improvement Costs		
From	To	Unit Rate
0 L	2 LIA	2400
0 L	2LUA	3250
0 L	2LIC	2400
0 L	3LIA	3600
2LAR	2LIC	2000
2LAR	3LUA	4850
2LRC	2LIC	2000
2LRC	2LIA	2000
2LIC	3LIC	1200

Appendix B4: Transit Cost Estimates

Total	2021 - 2030	2030 - 2040	2040 - 2050	2050 - 2060
Acheson	\$8,300,000	\$10,400,000	\$12,500,000	\$14,500,000
Stony Plain	\$12,400,000	\$19,000,000	\$22,700,000	\$26,500,000
Spruce Grove	\$28,000,000	\$36,000,000	\$43,100,000	\$50,200,000
Fifth Meridian ASP	\$0	\$0	\$0	\$0

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Acheson	Tri-regional	598750	598750	598750	930750	930750	930750	930750	930750	930750	930750
Stony Plain	Regional (RTSC report)	0	208000	212000	216000	220000	224000	727920	740659	753620	766808
	Tri-Region Transit	598750	598750	598750	930750	930750	930750	930750	930750	930750	930750
Spruce Grove	Regional (RTSC report)	0	1171000	1190000	1217000	1242000	1267000	1289172.5	1311733	1334688	1358045
	Tri-Regional Transit	1197500	1197500	1197500	1861500	1861500	1861500	1861500	1861500	1861500	1861500
Fifth Meridian ASP	Tri-regional										

		2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Acheson	Tri-regional	949365	968352	987719	1007474	1027623	1048176	1069139	1090522	1112332	1134579
Stony Plain	Regional (RTSC report)	782145	797788	813743	830018	846619	863551	880822	898438	916407	934735
	Tri-Region Transit	949365	968352	987719	1007474	1027623	1048176	1069139	1090522	1112332	1134579
Spruce Grove	Regional (RTSC report)	1385206	1412910	1441169	1469992	1499392	1529380	1559967	1591167	1622990	1655450
	Tri-Regional Transit	1898730	1936705	1975439	2014947	2055246	2096351	2138278	2181044	2224665	2269158
Fifth Meridian ASP	Tri-regional										

		2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Acheson	Tri-regional	1154434	1173829	1193549	1213601	1233989	1254720	1275799	1297233	1319026	1341186
Stony Plain	Regional (RTSC report)	950439	966406	982642	999150	1015936	1033004	1050358	1068004	1085947	1104190
	Tri-Region Transit	1153640	1173021	1192728	1212766	1233140	1253857	1274922	1296340	1318119	1340263
Spruce Grove	Regional (RTSC report)	1683261	1711540	1740294	1769531	1799259	1829487	1860222	1891474	1923250	1955561
	Tri-Regional Transit	2307280	2346042	2385456	2425531	2466280	2507714	2549843	2592681	2636238	2680527
Fifth Meridian ASP	Tri-regional										

		2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
Acheson	Tri-regional	1360633	1380362	1400378	1420683	1441283	1462182	1483383	1504892	1526713	1548851
Stony Plain	Regional (RTSC report)	1120201	1136444	1152923	1169640	1186600	1203805	1221261	1238969	1256934	1275160
	Tri-Region Transit	1359697	1379413	1399414	1419706	1440291	1461176	1482363	1503857	1525663	1547785
Spruce Grove	Regional (RTSC report)	1983917	2012683	2041867	2071474	2101511	2131983	2162897	2194259	2226075	2258353
	Tri-Regional Transit	2719394	2758826	2798829	2839412	2880583	2922351	2964726	3007714	3051326	3095570
Fifth Meridian ASP	Tri-regional	0	0	0	0	0	0	0	0	0	0

Tri-municipal Transit Plan	Annual Costs	
1 to 3 years	\$2,395,000	(excludes option 3 and 5, which are regional service costs, provided by the RTSC)
3 - 7 years	\$3,723,000	(excludes option 11 and 15, which are regional service costs provided by the RTSC)

	Cost share	1 to 3 years	3 to 10 years
Stony Plain	25.0%	\$598,750	\$930,750
Spruce Grove	50.0%	\$1,197,500	\$1,861,500
Parkland	25.0%	\$598,750	\$930,750

Appendix B.5 Active Transportation Costs

	2020 - 2030	2030 - 2040	2040 - 2050	2050 - 2060
Acheson	\$0	\$0	\$0	\$0
Stony Plain	\$1,400,000	\$0	\$0	\$0
Spruce Grove	\$1,900,000	\$0	\$0	\$0
Fifth Meridian ASP	\$0	\$0	\$0	\$0

Route			Length	Cost
Stony Plain	Gloryhills Road	Veterans Boulevard	4800	\$ 1,440,000
Spruce Grove	Veterans Boulevard	Pioneer Drive	6400	\$ 1,920,000

\$300 per meter

Appendix B6: High Load Corridor Costs

Total	2021 - 2030	2030 - 2040	2040 - 2050	2050 - 2060
Acheson	\$0	\$200,000	\$0	\$0
Stony Plain	\$0	\$200,000	\$0	\$0
Spruce Grove	\$0	\$200,000	\$0	\$0
Fifth Meridian ASP	\$0	\$75,000	\$0	\$0

Rotatable Bases	Cost
16 A and Veterans Boulevard	\$ 75,000
Campsite and 16 A	\$ 75,000
Campsite and Tamarack	\$ 75,000
Tamara and Century	\$ 75,000
Tamarack and Golden Spike	\$ 75,000
3 signals in Acheson	\$ 75,000
Total	\$ 450,000
Contingency/other signs	\$ 150,000
Total plus contingency	\$ 600,000