Appendix A

2016 Spruce Grove Growth Study

A

ISL Engineering and Land Services

The City of Spruce Grove

metro economics

Inspiring sustainable thinking

City of Spruce Grove

Final Report

2016 Spruce Grove Growth Study

December 2016

ISL Engineering and Land Services

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

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1.0 Introduction

1.1 Preamble

The City of Spruce Grove Growth Study comprises one of two key documents for the City of Spruce Grove's consideration in planning for the City's future growth. The second key document is the City of Spruce Grove Financial Impact Analysis. The Growth Study has been prepared by ISL Engineering and Land Services (ISL) and Metro Economics with support from CORVUS Business Advisors (CORVUS). The Financial Impact Analysis has been prepared by CORVUS with support from ISL.

The main focus of this Growth Study is to project the City's future growth over the next 50 years. More specifically, the Growth Study determines how much land will be required to accommodate projected growth, both inside and outside of the City's current boundaries. It looks at both short and long-term growth objectives, the type of growth contemplated (i.e. residential, commercial, industrial, and public services), and provides rationale for that growth. The Growth Study also identifies density objectives and preliminary future land use.

To accomplish this, the Growth Study:

- Establishes a study area and a set of underlying growth principles;
- Analyzes historical population growth and demographics;
- Presents three sets of future population growth projections and recommends a population growth scenario;
- Analyzes the status of the City's current land supply and historical land absorption;
- Analyzes the study area from various environmental, serviceability, land use and other perspectives to determine opportunities and constraints;
- Establishes density and other growth assumptions for the purpose of generating future land requirements;
- Generates future land requirements for residential, commercial, industrial and public services uses;
- Recommends expansion areas to accommodate the City's projected growth beyond its current boundaries; and
- Presents preliminary future land use and staging concepts for the remaining land within the City and the recommended expansion areas beyond its current boundaries.

1.2 Historical Municipal Context

Six quarter sections east of present-day Spruce Grove were originally incorporated as the Village of Spruce Grove on March 14, 1907. Its first recorded population was 16 according to the 1911 census. After the Grand Truck Railway was constructed through the area in 1908, a train station was built in what is now present-day Spruce Grove. The survey of a new townsite adjacent to the rail line and train station was then registered in 1912. The original Village of Spruce Grove was subsequently dissolved on August 30, 1916, becoming part of the Rural Municipality of Spruce Grove No. 519.

The first recorded population of the relocated community was 76 in 1931. The growth of the community through to the mid-1950s led to Spruce Grove being incorporated as a village for a second time on January 1, 1955. After recording a population of 598 in 1966, Spruce Grove's population grew by over 400% in the following five years to 3,029 in 1971. The village was incorporated as a town on January 1, 1971.

Within ten years, Spruce Grove's population grew by 240% to 10,326 in 1981, making it eligible for city status, which it attained in 1986. In the 30 years since incorporating as a city, Spruce Grove has nearly tripled its population, growing from 11,918 in 1986 to 33,640 in 2016.

Prior to attaining city status in 1986, Spruce Grove and nearby Stony Plain began investigating the possibility of amalgamation in 1984. The two municipalities agreed in 1985 to not proceed with a merger at that time. A similar discussion ensued in the 1990s but the outcome was the same.

1.3 Boundary Adjustment History

As illustrated in Map 1, Spruce Grove's municipal boundary has been adjusted 14 times since its 1955 incorporation. Twelve of these adjustments were expansions resulting from annexation, while two were separations or withdrawals of land.

Of the 12 annexations, two were minor boundary adjustments amounting to 11.5 ha or less than 0.2 quarter sections, consisting of:

- 6.4 ha of road right-of-way (portion of Jennifer Heil Way between Highways 16 and 16A) in 1980; and
- 5.3 ha of road right-of-way (portion of Century Road south of Highway 16A) in 1983.

Of the remaining ten boundary adjustments, five were small boundary adjustments of 0.6 through 3.6 quarter sections in size, consisting of:

- 62 ha (1 quarter) in 1962;
- 38 ha (0.6 quarters) in 1969;
- 102 ha (1.6 quarters) in 1975;
- 65 ha (1 quarter) in 1976; and
- 228 ha (3.6 quarters) in 1979.

Together, the above five small boundary adjustments amount to 495 ha or 7.7 quarter sections, averaging 99 ha or 1.5 quarter sections in size.

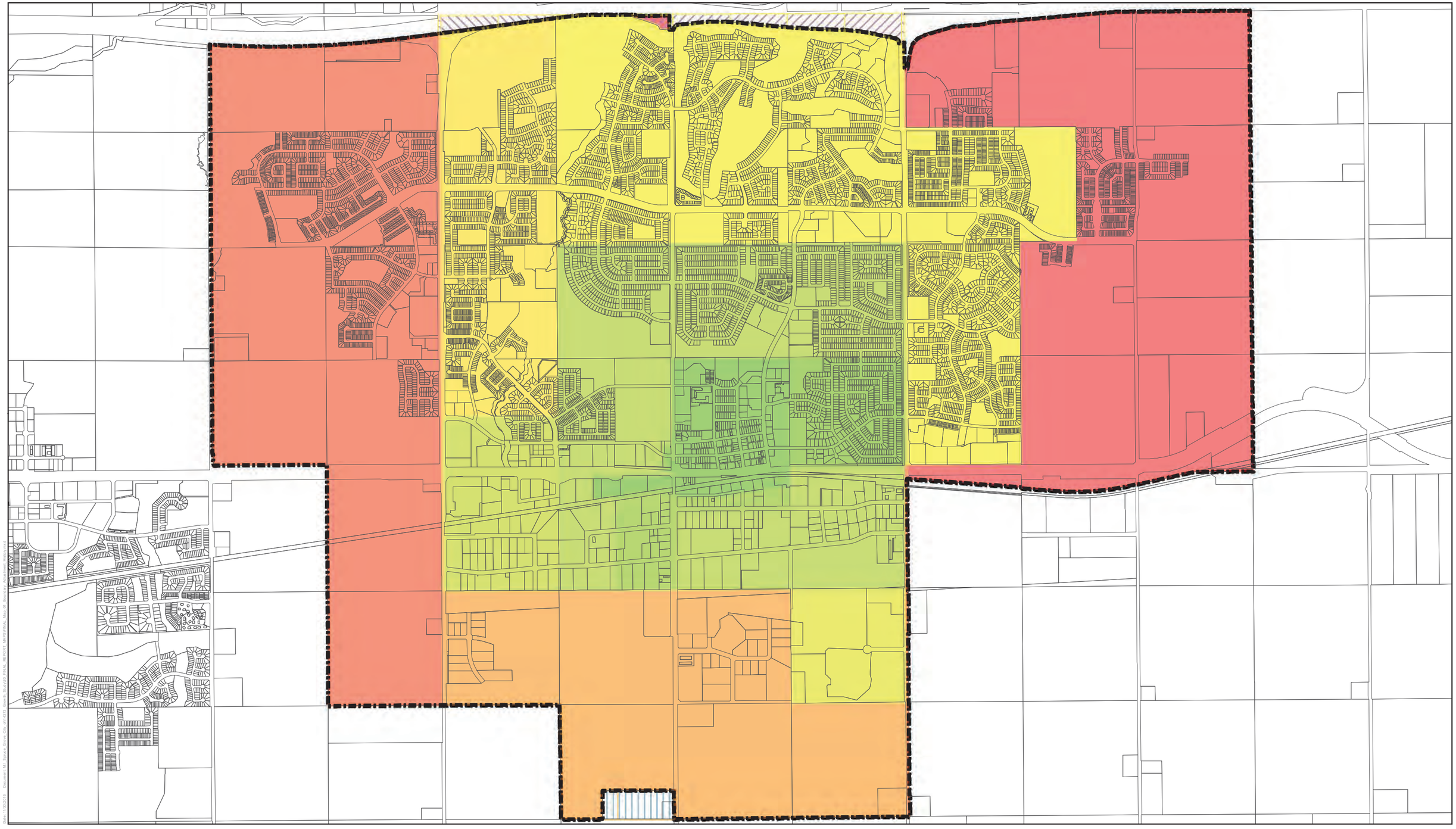
The final five expansions were larger boundary adjustments that were greater than four quarter sections in size, consisting of:

- 405 ha (6.3 quarters) in 1971;
- 614 ha (9.6 quarters) in 1978;
- 394 ha (6.2 quarters) in 1981;
- 613 ha (9.6 quarters) in 1991; and
- 572 ha (8.9 quarters) in 2007.

Together, the above five larger boundary adjustments amount to nearly 2,600 ha or 41 quarter sections, averaging 520 ha or 8.1 quarter sections.

The following is a summary of the City's two separations of land.

- In 1982, 10.1 ha (0.2 quarters) at the south end of the City on the west side of Calahoo Road, which had been annexed a year prior, was withdrawn and returned to Parkland County at the request of the affected landowner.
- In 1986, 24.0 ha (0.4 quarters) of Highway 16 road allowance along the north edge of the City was withdrawn concurrently with Spruce Grove's incorporation as a city. These lands were originally annexed to Spruce Grove over the course of three annexations between 1978 and 1980 inclusive.



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0 250 500 1,000 1,500 metres

- City Boundary
- Parcel
- 1955 (incorporated)
- 1962 (added)
- 1969 (added)
- 1971 (added)
- 1975 (added)
- 1976 (added)
- 1978 (added)
- 1979 (added)
- 1980 (added)
- 1981 (added)
- 1983 (added)
- 1991 (added)
- 2007 (added)
- 1978 (added) and 1986 (severed)
- 1979 (added) and 1986 (severed)
- 1980 (added) and 1986 (severed)
- 1981 (added) and 1982 (severed)
- 1978 (added), 1986 (severed) and 2007 (re-added)

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The City of Spruce Grove

GROWTH STUDY • MAP 1
BOUNDARY ADJUSTMENT HISTORY

Spruce Grove's most recent boundary adjustment occurred on January 1, 2007 when it acquired 8.9 quarter sections from Parkland County for residential and commercial expansion purposes. The area subject to the boundary adjustment was located between Highway 16 to the north and the Canadian National rail line to the south. The adjustment facilitated an eastward expansion of the City toward the Wagner Natural Area and Acheson Industrial Area.

Prior to the 2007 annexation, Spruce Grove's most recent boundary adjustment occurred on June 30, 1991. The adjustment involved the annexation of 9.6 quarter sections from Parkland County that are now mostly developed with or designated for residential and commercial uses. The annexation facilitated westward expansion of the City toward the Town of Stony Plain, and included nearly full eight quarter sections bound by Highway 16A to the south, Jennifer Heil Way to the east, Highway 16 to the north, and Boundary Road to the west. It also included two quarter sections south of Highway 16A that were originally intended for industrial use, but were ultimately designated for residential and commercial uses in part for land use compatibility with advancing residential development within Stony Plain to the west.

The most recent boundary adjustment that substantially expanded the City's industrial land base occurred on January 1, 1981. It involved two separate annexation applications for a combined 6.2 quarter sections in southern Spruce Grove between Campsite Road to the west and Century Road to the east. Approximately 10 ha (25 acres) of these lands were separated and returned to Parkland County on January 1, 1982 at the request of the landowner of the subject parcel.

1.4 Study Area

The study area analyzed within the Growth Study comprises lands in Parkland County and the Town of Stony Plain as presented in Map 2: Study Area.

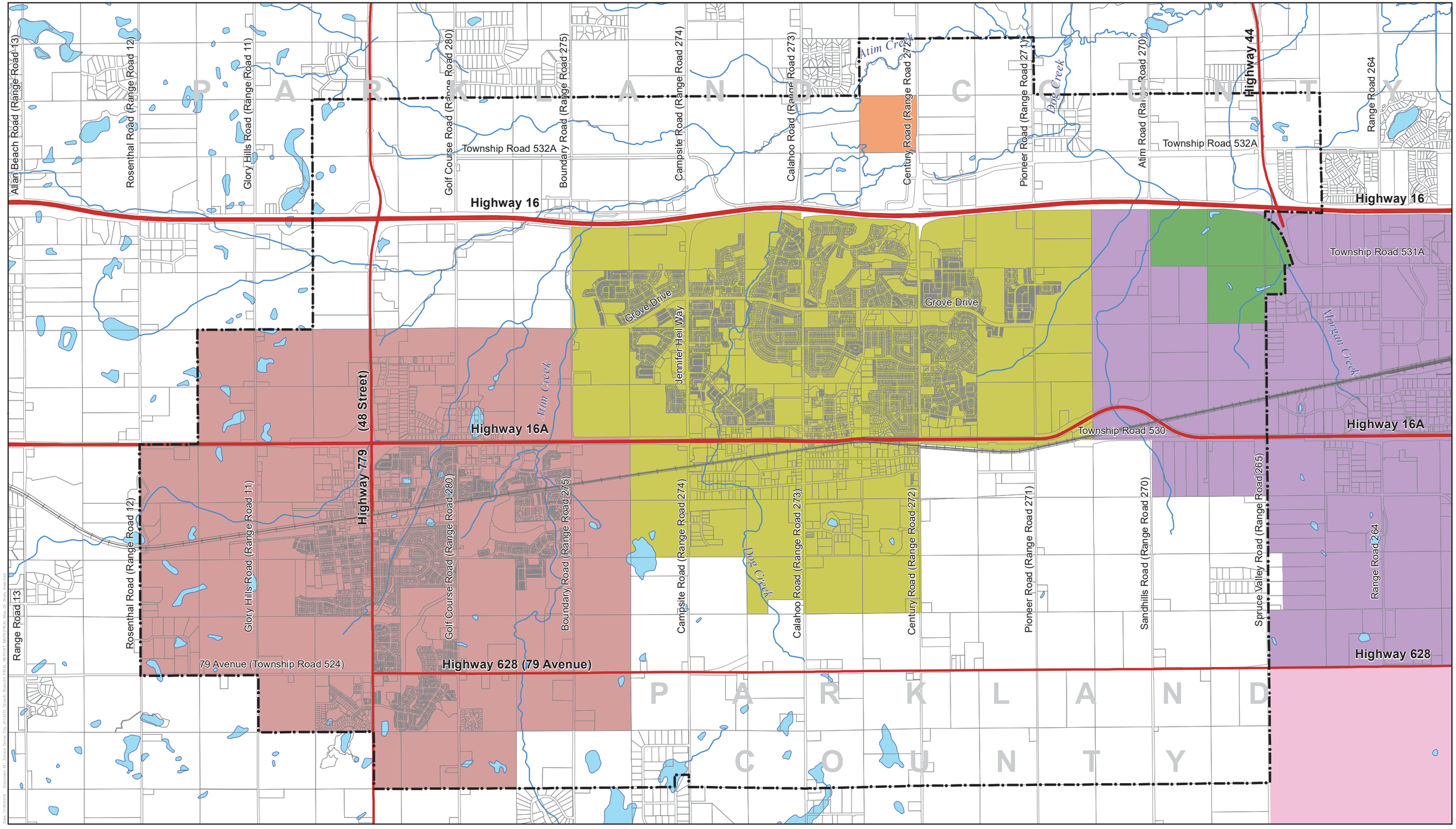
The study area includes the entirety of Stony Plain in event that amalgamation of the Town of Stony Plain and the City of Spruce Grove is a desired growth strategy option. It also facilitates investigation of lands adjacent to the shared municipal boundary that may be more logically serviced and developed under the jurisdiction of the City.

Beyond the Town and City, the study area generally includes lands from 1.6 km (1.0 mi) north of Highway 16 in the north to 1.6 km (1.0 mi) south of Highway 628 in the south. The lands between Highway 16 in the north and Highway 628 in the south align with conceptual boundaries of Priority Growth Area 'A' identified in the October 2009 Addendum to the Capital Region Growth Plan, and are mostly within the conceptual boundaries of the Metropolitan Area policy tier identified in the Edmonton Metropolitan Region Growth Plan. The 1.6 km (1.0 mi) beyond these highways also provide the opportunity to investigate the development of complete communities on either side of these highways. Complete communities are typically achieved within a full section or one square mile of land (four quarter sections).[1]

Within the north portion of the study area, the study area boundary includes an extra half mile in the vicinity of sewage lagoons adjacent to Parkland Village in the event that recommended future growth includes northern expansion and that it would be logical to incorporate the lagoon lands within the recommended growth areas. In the south, the study area excludes the portions of three parcels within the Green Acre Estates subdivision straddling the section line that forms the study area boundary. These parcels gain physical access from a public road internal to the subdivision through lands to the south of the study area.

Spruce Valley Road (Range Road 265) and the east edge of the Wagner Natural Area were selected as the eastern boundary of the study area between Highways 16 and 628 as they largely form the western boundary of planned future development within Parkland County's Acheson Industrial Area Structure Plan. South of Highway 628, the study area shares a boundary with the Enoch Cree Nation.

[1] Source: Leduc County (Planning Review of the Town of Beaumont 2014 Growth Study (March 2015), pg. 30)



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0 500 1,000 2,000 3,000 metres

- Parcel
- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial Area Structure Plan
- Enoch Cree Nation
- Parkland Village
- Wagner Natural Area
- Rail Line
- Highway
- Watercourse
- Water Body

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The City of SPRUCE GROVE

GROWTH STUDY • MAP 2
STUDY AREA

North of Highway 16, the study area included a half mile of lands east of Highway 44. This was done to understand potential land use compatibility implications of lands east of the highway in the event that recommended future growth directions involved lands on the west side of the highway. Similarly, in the northwest portion of the study area north of Stony Plain, the half mile of lands west of Highway 779 was included to understand potential land use compatibility implications in the event that recommended future growth directions involved lands on the east side of the highway.

1.5 Growth Principles

To guide the preparation of this Growth Study and the associated Financial Impact Assessment, guiding growth principles were established to provide a philosophical sub-regional context for the investigation of future directions for the City's growth and options for how growth may best be accommodated. These guiding growth principles are as follows:

1. City policy requires a 25-year land supply of residential and non-residential (commercial, industrial and public services) land uses to accommodate future population and economic growth requirements. The overall supply of lands within the City's current boundary falls below the 25-year benchmark and the City requires that options for continued growth be identified.
2. The City must sustain its growth in the medium and long term. The purpose of this Growth Study is to determine the City's land supply needs for a 50-year planning horizon.
3. All growth rates used to determine the City's future land requirements must be realistic and based on the review of a range of scenarios.
4. Future directions for growth must acknowledge known opportunities and constraints to future urban growth within the City's boundaries and expansion beyond the City's boundaries. Some constraints to future growth direction may include, but not be limited to: regional water and wastewater lines that bisect City lands to the south and northwest respectively; Wagner Natural Area on lands northeast of the City; Parkland Village on lands northeast of the City; and the Parkland Airport approach path restrictions on lands to the south.
5. Future growth must be supported by future hard and soft infrastructure and capital requirements that are financially sustainable.
6. Future growth and development must comply with regional land use principles, policies and residential density targets contained in the Capital Region Growth Plan.
7. Future growth and development must align with the City's Strategic Plan and community values and must ensure the City's fiscal sustainability.
8. Lands identified for future urban expansion must be planned and developed in a manner that minimizes impacts on the natural environment, preserves critical environmental areas such as the Wagner Natural Area, and sustains the community's high quality of life through preservation of open spaces. Development setbacks from environmental features, such as wetlands and their associated natural areas must be respected, while alternative development standards may be considered in the vicinity of natural areas.
9. The City's economic base must be stable and able to support the provision of municipal infrastructure and services.
10. The City must have a sustainable mix of land uses to offer existing and future residents opportunities to live, work, play and invest in complete communities.
11. City taxes must be applied fairly and equitably to all taxpayers to meet the needs of the community.
12. The City will work collaboratively with adjacent municipalities, regional service agencies and provincial ministries throughout the Growth Study process to coordinate future directions for growth.
13. The impacts of future growth and development on public stakeholders and service providers must be investigated. These stakeholders and providers include, but may not be limited to, Parkland County, the Town of Stony Plain, residents from all three municipalities, school boards, utility and other service providers, regional commissions, provincial ministries, landowners who may be affected by growth decisions and environmental groups.

14. Future directions for growth must be determined in compliance with the intent of all applicable statutory plans and provincial legislation, including the annexation principles established by the Municipal Government Board if annexation is pursued, as well as consideration of the Boundary Interface Planning Study.
15. Recommendations regarding future directions for growth must be supported by robust, quantitative analysis of future land uses, infrastructure and fiscal requirements to meet the community's needs.
16. The City will share information arising out of the Growth Study with its municipal partners – the Town of Stony Plain and Parkland County. Further, for any data sharing requests of the Town and County from the City, the City will reciprocate this sharing by providing the City's equivalent data back to the Town and County.

2.0 Historical Growth and Demographics

2.1 Spruce Grove Historical Population Growth

Table 1 illustrates the City of Spruce Grove's historical population growth according to federal census results since 1931 (refer to the rows in grey), and municipal census results since 1961. Overall changes, average annual growth rates and average growth in people per year between federal and municipal censuses are presented.

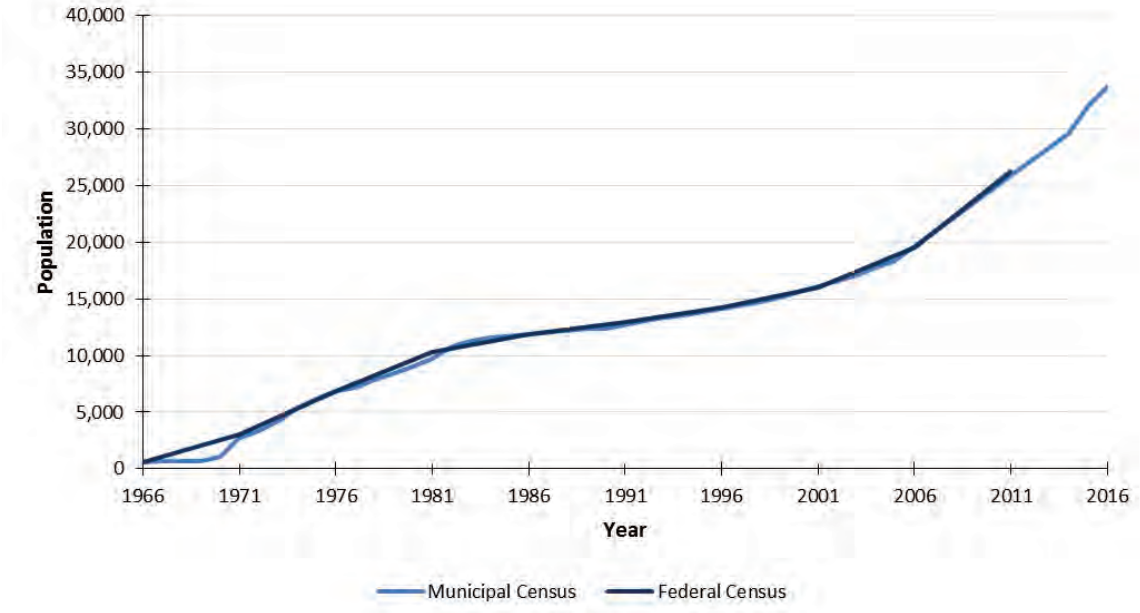
Table 1: Spruce Grove Historical Population Growth, 1931-2016

Year	Federal Census History					Municipal Census History			
	Original Population	Revised Population	Change Over Period	Avg. Annual Growth	Avg. People per Year	Population	Change Over Period	Average Annual Growth	Average People per Year
1931	76		230.4%	8.3%	4				
1941	160		110.5%	7.7%	8				
1951	227		41.9%	3.6%	7				
1956	309		36.1%	6.4%	16				
1960						398			
1961	465		50.5%	8.5%	31	432	8.5%	8.5%	34
1962						508	17.6%	17.6%	76
1963						536	5.5%	5.5%	28
1964						596	11.2%	11.2%	60
1965						610	2.3%	2.3%	14
1966	598		28.6%	5.2%	27	580	-4.9%	-4.9%	-30
1967						640	10.3%	10.3%	60
1968						667	4.2%	4.2%	27
1969						723	8.4%	8.4%	56
1970						1,110	53.5%	53.5%	387
1971	3,029	3,055	406.5%	38.3%	486	2,706	143.8%	143.8%	1,596
1972						3,320	22.7%	22.7%	614
1973						4,256	28.2%	28.2%	936
1974						5,380	26.4%	26.4%	1,124
1975						6,135	14.0%	14.0%	755
1976	6,907	6,996	126.1%	17.7%	776	6,827	11.3%	11.3%	692
1977						7,137	4.5%	4.5%	310
1978						7,874	10.3%	10.3%	737
1979						8,411	6.8%	6.8%	537
1980						9,074	7.9%	7.9%	663
1981	10,326	10,320	47.6%	8.1%	684	9,749	7.4%	7.4%	675
1982						10,784	10.6%	10.6%	1,035
1983						11,307	4.8%	4.8%	523
1984						11,569	2.3%	2.3%	262
1986	11,918		15.5%	2.9%	318	11,897	2.8%	1.4%	164

Year	Federal Census History					Municipal Census History			
	Original Population	Revised Population	Change Over Period	Avg. Annual Growth	Avg. People per Year	Population	Change Over Period	Average Annual Growth	Average People per Year
1989						12,332	3.7%	1.2%	145
1990						12,403	9.7%	1.3%	157
1991	12,908		8.3%	1.6%	198				
1992						13,076	5.4%	2.7%	337
1996	14,271		10.6%	2.0%	273	14,123	8.0%	1.9%	262
1999						15,069	6.7%	2.2%	315
2001	15,983		12.0%	2.3%	342				
2003						17,082	13.4%	3.2%	503
2005						18,405	7.7%	3.8%	662
2006	19,496	19,541	22.0%	4.1%	703				
2009						23,326	26.7%	6.1%	1,230
2010						24,646	5.7%	5.7%	1,320
2011	26,171		33.9%	6.0%	1,335				
2014						29,526	19.8%	4.6%	1,220
2015						32,036	8.5%	8.5%	2,510
2016	tbd [2]		tbd	tbd	tbd	33,640	5.0%	5.0%	1,604

Figure 1 illustrates the City's historical population growth over the past 50 years since 1966.

Figure 1: Spruce Grove Historical Population Growth, 1966-2016



[2] Population and dwelling counts from the 2016 Census of Canada will be published on February 8, 2017.

The following are key observations from Table 1 and Figure 1.

- Over the course of its history, Spruce Grove has grown from a population of 76 in 1931 to 33,640 in 2016.
- At its 2016 population of 33,640, the City has:
  - nearly tripled its population over the past 33 years since recording a population of 11,307 in 1983 – an increase of 22,333; and
  - more than doubled its population over the past 15 years since recording a population of 15,983 in 2001 – an increase of 17,657.
- Since 2001 when Spruce Grove had less than half its current population, more than 50% of the City's growth has occurred in the past six years and more than 75% has occurred in the past nine years.
- Among the various federal censuses conducted between 1961 and 2011, Spruce Grove's average annual growth rate has varied between 1.6% and 38.3%.

In addition to these observations, the City grew by 33.9% between 2006 and 2011 making it the fourth-fastest growing city and seventh-fastest growing municipality in Alberta.[3]

Also, while not attributable to the City's recent growth, Spruce Grove was one of eight urban communities within the Capital Region to be designated as a Priority Growth Area (PGA) in the Capital Region Growth Plan (CRGP).[4] PGAs are "Locations where growth is directed, including major employment areas, due to existing or planned multi-modal transportation corridors, the proximity to existing or proposed major employment areas, the redevelopment or intensification opportunities within an existing urban area and the ability to utilize and maximize existing infrastructure or logically and efficiently extend that infrastructure."[5] Thus it is anticipated growth will continue to be directed to Spruce Grove within the context of the CRGP.

Table 2 illustrates the City's growth rates over various intervals from 1966, ranging from the past 10 years to the past 50 years.

Table 2: Spruce Grove Historical Population Growth Between Various Intervals, 1966-2016

Time Period	Change Over Period	Average Annual Growth	Average People per Year
50 years (1966-2016)	5525%	8.4%	661
40 years (1976-2016)	387%	4.0%	670
30 years (1986-2016)	182%	3.5%	725
20 years (1996-2016)	136%	4.4%	976
10 years (2006-2016)	73%	5.6%	1,414

[3] Source: Statistics Canada (Population and dwelling counts, for Canada and census subdivisions (municipalities) with 5,000-plus population, 2011 and 2006 censuses)
[4] Source: Capital Region Board (Capital Region Growth Plan: October 2009 Addendum)
[5] Source: Capital Region Board (Planning Toolkit: Priority Growth Areas Fact Sheet)

Spruce Grove's population growth pattern over the past 50 years is reflective of several factors, including the following:

- the City's proximity to employment opportunities within the Acheson Industrial Area and other employment areas within Parkland County;
- its proximity to a large population and employment base within the Capital Region that attracts global economic opportunities and advantages; and
- a high quality of life that makes Spruce Grove attractive to families.

In addition, Spruce Grove's accelerated growth pattern over the past 10 years is reflective of several factors including:

- increased development and employment opportunities within the Acheson Industrial Area adjacent to the City to the east;
- joint intermunicipal investments in social capital infrastructure such as the Tri-Leisure Centre;
- efficient commuting corridors to Edmonton including the twinned Highways 16 and 16A; and
- some of the lowest infrastructure costs in the Capital Region that makes it attractive to developers.

2.2 Stony Plain Historical Population Growth

Table 3 illustrates the Town of Stony Plain's historical population growth according to federal census results since 1911 (refer to the rows in grey) and municipal census results since 1960. Overall changes, average annual growth rates and average growth in people per year between federal and municipal censuses are presented.

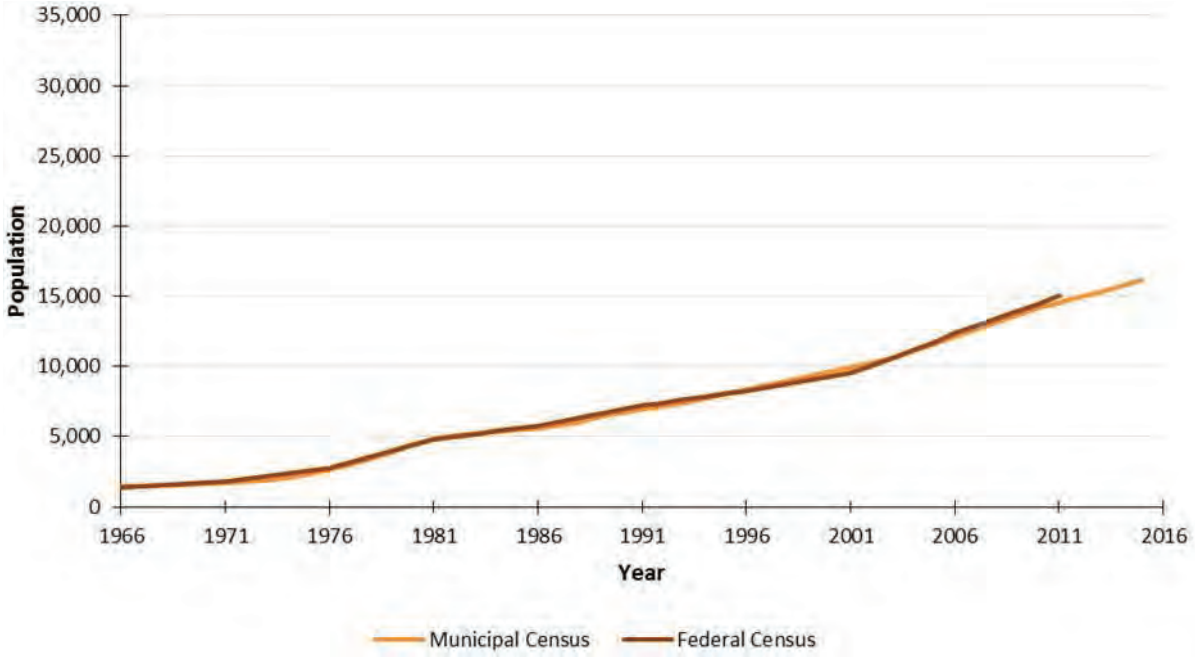
Table 3: Stony Plain Historical Population Growth, 1911-2015

Year	Federal Census History					Municipal Census History			
	Original Population	Revised Population	Change Over Period	Avg. Annual Growth	Avg. People per Year	Population	Change Over Period	Average Annual Growth	Average People per Year
1911	505								
1916	293		-42.0%	-10.3%	-42				
1921	360		22.9%	4.2%	13				
1926	456		26.7%	4.8%	19				
1931	497		9.0%	1.7%	8				
1936	499		0.4%	0.1%	0				
1941	566		13.4%	2.6%	13				
1946	720		27.2%	4.9%	31				
1951	878		21.9%	4.0%	32				
1956	1,098		25.1%	4.6%	44				
1960						1,235			
1961	1,311		19.4%	3.6%	43	1,408	14.0%	14.0%	173
1963						1,433	1.8%	0.9%	13
1964						1,463	2.1%	2.1%	30
1965						1,518	3.8%	3.8%	55
1966	1,397		6.6%	1.3%	17	1,480	-2.5%	-2.5%	-38
1967						1,464	-1.1%	-1.1%	-16
1970						1,628	11.2%	3.6%	55
1971	1,770		26.7%	4.8%	75	1,686	3.6%	3.6%	58
1973						1,919	13.8%	6.7%	117
1974						2,042	6.4%	6.4%	123
1975						2,316	13.4%	13.4%	274
1976	2,717	2,859	53.5%	8.9%	189	2,708	16.9%	16.9%	392

Year	Federal Census History					Municipal Census History			
	Original Population	Revised Population	Change Over Period	Avg. Annual Growth	Avg. People per Year	Population	Change Over Period	Average Annual Growth	Average People per Year
1977						3,040	12.3%	12.3%	332
1978						3,433	12.9%	12.9%	393
1979						3,884	13.1%	13.1%	451
1980						4,442	14.4%	14.4%	558
1981	4,839		69.3%	11.1%	424	4,834	8.8%	8.8%	392
1982						5,105	5.6%	5.6%	271
1983						5,291	3.6%	3.6%	186
1986	5,802		19.9%	3.7%	193	5,576	5.4%	1.8%	95
1988						6,062	8.7%	4.3%	243
1989						6,427	6.0%	6.0%	365
1990						6,689	4.1%	4.1%	262
1991	7,226		24.5%	4.5%	285				
1993						7,405	10.7%	3.4%	239
1996	8,274		14.5%	2.7%	210				
2001	9,589	9,624	15.9%	3.0%	263				
2003						10,544	42.4%	3.6%	314
2006	12,363		28.5%	5.1%	555				
2010						14,177	34.5%	4.3%	519
2011	15,051		21.7%	4.0%	538				
2015						16,127	13.8%	2.6%	390
2016	tbd [6]		tbd	tbd	tbd				

Figure 2 illustrates the Town's historical population growth over the past 50 years since 1966.

Figure 2: Stony Plain Historical Population Growth, 1966-2015



[6] Population and dwelling counts from the 2016 Census of Canada will be published on February 8, 2017.

The following are key observations from Table 3 and Figure 2.

- Over the course of its history, Stony Plain has grown from a population of 505 in 1911 to 16,127 in 2015.
- At its 2015 population of 16,127, the Town has:
  - tripled its population over the past 32 years since recording a population of 5,291 in 1983 – an increase of 10,836; and
  - doubled its population over the past 20 years based on a 1995 interpolated population of 8,053 – an increase of 8,074.
- Since 1995 when Stony Plain had half its current population, just under 50% of the Town's growth occurred in the first ten years and just over 50% has occurred in the past ten years; however, only 13% has occurred in the past four years.
- Among the various federal censuses conducted between 1961 and 2011, Stony Plain's average annual growth rate has varied between 1.3% and 11.1%.

In addition to these observations, the Town grew by 21.7% between 2006 and 2011 making it the twelfth-fastest growing municipality in Alberta.[7]

Also, Stony Plain, like Spruce Grove, was one of eight urban communities within the Capital Region to be designated as a PGA in the CRGP.[8] Thus it is anticipated growth will continue to be directed to Stony Plain within the context of the CRGP.

Table 4 illustrates the Town's growth rates over various intervals from 1965, ranging from the past 10 years to the past 50 years. As no municipal censuses were conducted in 1985, 1995 and 2005, population counts for those years were based on interpolations of federal census population counts.

Table 4: Stony Plain Historical Population Growth between Various Intervals, 1965-2015

Time Period	Change Over Period	Average Annual Growth	Average People per Year
50 years (1965-2015)	962%	4.8%	292
40 years (1975-2015)	596%	5.0%	345
30 years (1985-2015)	188%	3.6%	351
20 years (1995-2015)	100%	3.5%	404
10 years (2005-2015)	38%	3.2%	441

Like Spruce Grove, Stony Plain's historical population growth pattern over the past 50 years is reflective of several factors, including the following:

- the Town's proximity to employment opportunities within the Acheson Industrial Area and other employment areas within Parkland County;
- its proximity to a large population and employment base within the Capital Region that attracts global economic opportunities and advantages; and
- a high quality of life and level of services that makes Stony Plain attractive to people of all ages.

Stony Plain's slower population growth pattern over the past 10 years is likely reflective of neighbouring Spruce Grove's closer proximity to employment within the Acheson Industrial Area and the City of Edmonton

[7] Source: Statistics Canada (Population and dwelling counts, for Canada and census subdivisions (municipalities) with 5,000-plus population, 2011 and 2006 censuses)
[8] Source: Capital Region Board (Capital Region Growth Plan: October 2009 Addendum)

in comparison to Stony Plain's geographic location. Further, Spruce Grove's greater population growth may be due to greater access to commuter highways, with Spruce Grove having direct access to both Highways 16 and 16A and Stony Plain having direct access to only Highway 16A.

2.3 Parkland County Historical Population Growth

Table 5 illustrates Parkland County's historical population growth according to federal census results since 1951 (refer to the rows in grey) and municipal census results since 1975. Overall changes, average annual growth rates and average growth in people per year between federal and municipal censuses are presented.

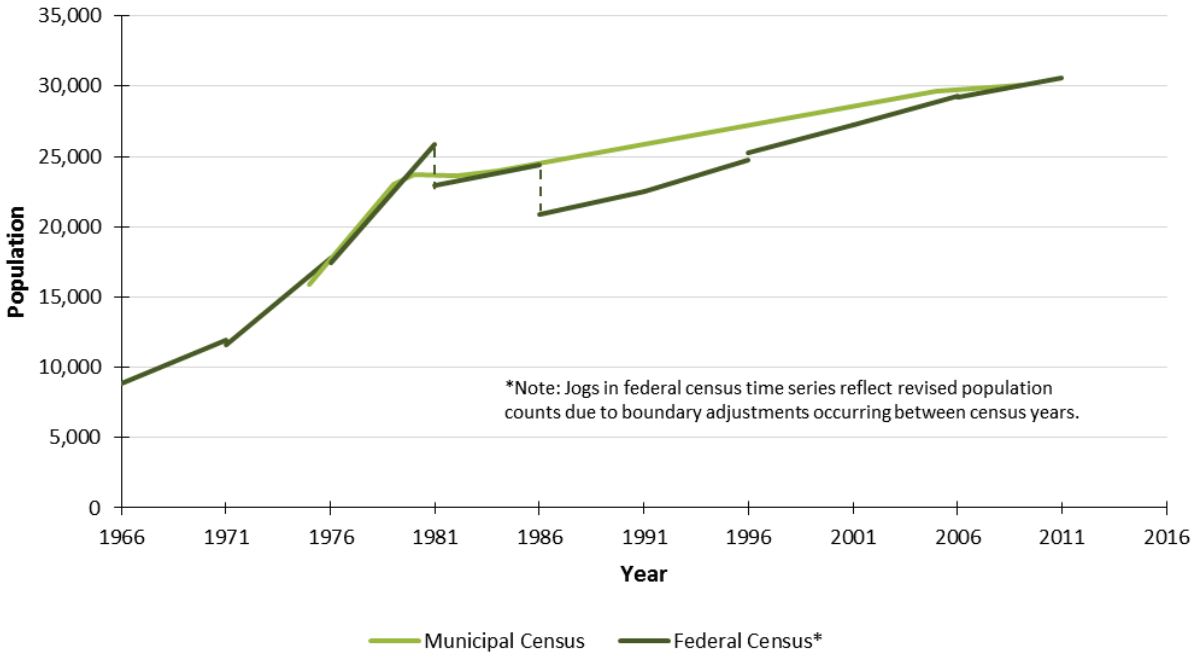
Table 5: Parkland County Historical Population Growth, 1951-2011

Year	Federal Census History					Municipal Census History			
	Original Population	Revised Population	Change Over Period	Avg. Annual Growth	Avg. People per Year	Population	Change Over Period	Average Annual Growth	Average People per Year
1951	8,962		-17.9%	-2.0%	-195				
1956	8,491		-5.3%	-1.1%	-94				
1961	9,238		8.8%	1.7%	149				
1966	8,848	8,846	-4.2%	-0.9%	-78				
1971	11,933	11,595	34.9%	6.2%	617				
1975						15,862			
1976	17,762	17,443	53.2%	8.9%	1,166				
1979						22,989			
1980						23,703			
1981	25,829	22,966	48.1%	8.2%	1,613				
1982						23,626			
1984						23,950			
1986	24,394	20,904	6.2%	1.2%	-287				
1991	22,550	22,527	7.9%	1.5%	-369				
1996	24,769	25,222	10.0%	1.9%	444				
2001	27,252	27,217	8.0%	1.6%	497				
2005						29,679			
2006	29,265	29,220	7.5%	1.5%	403				
2009						30,089	1.4%	0.3%	103
2011	30,568		4.6%	0.9%	261				
2016	tbd [9]		tbd	tbd	tbd				

Figure 3 illustrates the historical population growth of Parkland County over the past 50 years since 1966.

[9] Population and dwelling counts from the 2016 Census of Canada will be published on February 8, 2017.

Figure 3: Parkland County Historical Population Growth, 1966-2011



The following are key observations from Table 5 and Figure 3.

- Over the course of its history, Parkland County has grown from a population of 8,962 in 1951 to 30,568 in 2011.
- Since its last major boundary adjustment (separation of lands to create Brazeau County), Parkland County has grown by 46% over 25 years from 20,904 in 1986 to its 2011 population of 30,586.
- At its 2011 population of 30,568, the County has:
  - tripled its population over the past 43 years based on a 1968 interpolated population of 9,973 – an increase of 20,595; and
  - nearly doubled its population over the past 37 years based on a 1974 interpolated population of 15,413 – an increase of 15,155.
- Since 1986, just under 50% of the County's growth occurred in the first 12 years and just over 50% has occurred in the past 13 years; however, only 14% occurred in final five years.
- Among the various federal censuses conducted between 1961 and 2011, Parkland County's average annual growth rate has varied between -0.9% and 8.9%.

In addition to these observations, the County grew by 4.6% between 2006 and 2011 compared to the provincial average of 10.8% and the national average of 5.9%.[10]

Also, while not attributable to the County's recent growth, the majority of Parkland County is located outside designated PGAs in the CRGP.[11] However, the CRGP does designate lands north of Highway 16 as a Cluster Country Residential Area (CCRA). CCRAs are rural lands that have been or could be "subdivided to create multiple residential lots that are connected to municipal or communal services, designed to group or "cluster" the residential uses together on smaller lots by applying conservation design principles to maximize

[10] Source: Statistics Canada (2011 Census of Population)
[11] Source: Capital Region Board (Capital Region Growth Plan: October 2009 Addendum)

the retention of open space."[12] Further, Parkland County has a significant amount of previously zoned lands for traditional country residential development beyond this CCRA.[13] Thus it is anticipated that Parkland County will continue to capture growth within the Capital Region.

Table 5 illustrates the County's growth rates over various intervals from 1986, ranging from the past 5 years to the past 25 years. Intervals beyond 25 years are excluded as two major boundary adjustments (Edmonton's last major annexation and the separation of lands to create Brazeau County) would significantly understate the County's historical population growth rates.

Table 6: Parkland County Historical Population Growth Between Various Intervals, 1986-2011

Time Period	Change Over Period	Average Annual Growth	Average People per Year
25 years (1986-2011)	46%	1.5%	387
20 years (1991-2011)	36%	1.5%	402
15 years (1996-2011)	21%	1.3%	356
10 years (2001-2011)	12%	1.2%	335
5 years (2006-2011)	4.6%	0.9%	270

Parkland County's historic population growth pattern over the past 50 years is likely reflective of several factors, including the following:

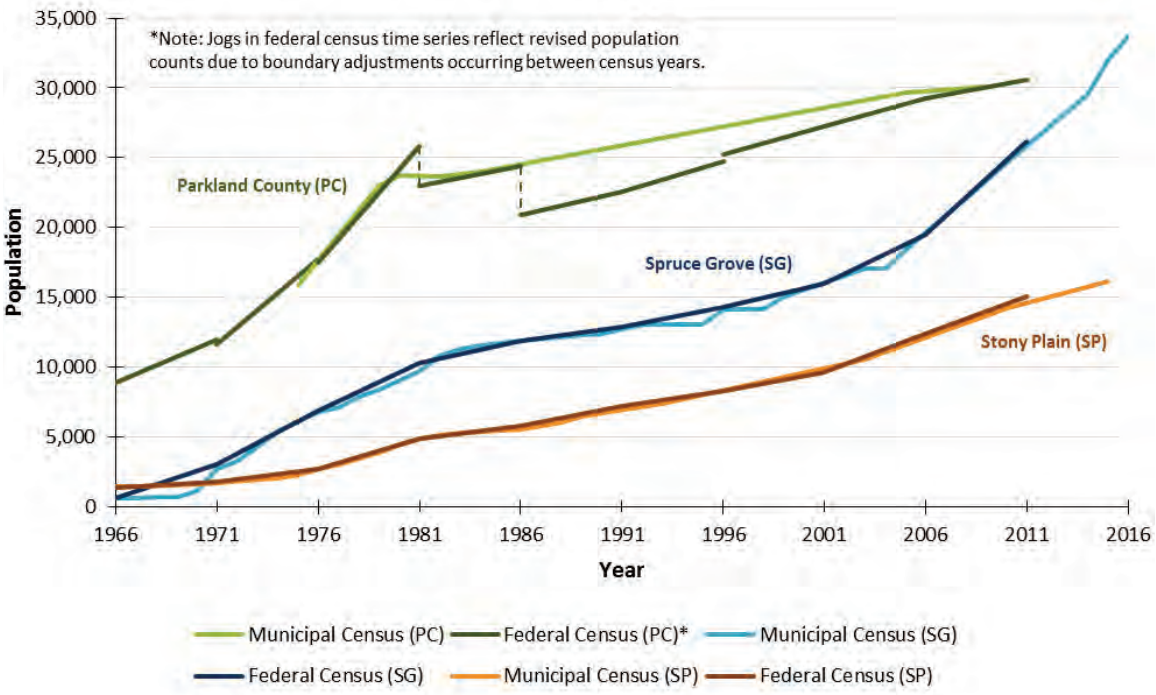
- significant growth in country residential acreage development in the east end of the County during the oil boom of the 1970s through early 1980s;
- proximity to the City of Edmonton and its associated employment opportunities and commercial and public services;
- similarly, proximity to commercial and public services within the City of Spruce Grove and the Town of Stony Plain; and
- the development of the Acheson Industrial Area, and its ongoing evolution and expansion as a significant employment generator in the Capital Region.

2.4 Historical Population Growth Comparisons

Figure 4 compares the historical population growth of Spruce Grove, Stony Plain and Parkland County previously illustrated in Figures 1 through 3.

[12] Source: Capital Region Board (Planning Toolkit: Cluster Country Residential Areas Fact Sheet)
[13] Source: Parkland County (Community Scan and Analysis)

Figure 4: Historical Population Growth Comparison, 1966-2016



The following are key observations from Figure 4.

- Subject to confirmation from the forthcoming results of the 2016 federal census, the population of Spruce Grove has surpassed that of Parkland County.
- The population of Spruce Grove surpassed that of Stony Plain in 1970/71. Spruce Grove's population is now twice the size as Stony Plain's population.
- In terms of absolute growth:
  - Stony Plain and Spruce Grove generally grew in parallel between 1981 and 2006;
  - Parkland County and Spruce Grove generally grew in parallel between 1966 and 1971 and again between 1981 and 2006;
  - Spruce Grove's growth outpaced Stony Plain's growth between 1970 and 1981;
  - Spruce Grove's growth has significantly outpaced that of both Parkland County and Stony Plain since 2006.

Further to Figure 4, Table 7 compares the historical population growth rates of Spruce Grove over selected timeframes with the seven other urban communities within the Capital Region's designated PGAs including the Town of Stony Plain.

Table 7: Historical Population Growth Rate Comparisons

Urban Community	Population History				Average Annual Growth Rates over Selected Timeframes		
	1961	2001	2011	2015	1961-2001	2001-2011	2011-2015
Beaumont	194	7,006	13,284	16,768	9.4%	6.6%	6.0%
Edmonton	281,027	666,104	812,201	n/a	2.2%	2.0%	n/a
Fort Saskatchewan	2,972	13,121	19,051	24,040	3.8%	3.8%	6.0%
Leduc	2,356	15,032	24,279	29,304	4.7%	4.9%	4.8%
Sherwood Park	2,923	47,645	64,733	68,672	7.2%	3.1%	1.5%
Spruce Grove	456	15,983	26,171	32,036	9.3%	5.1%	5.2%
St. Albert	4,059	53,081	61,466	n/a	6.6%	1.5%	n/a
Stony Plain	1,311	9,589	15,051	16,127	5.1%	4.6%	1.7%

The following are key observations from Table 7.

- Spruce Grove was the second-fastest growing urban community between 1961 and 2001 with an annual average growth rate of 9.3%, second only to the Town of Beaumont at 9.4%.
- Similarly, Spruce Grove was also the second-fastest growing urban community between 2001 and 2011 at 5.1% (after Beaumont at 6.6%), and has since recorded the third-highest growth rate between 2011 and 2015 at 5.2% (after Beaumont and Fort Saskatchewan, which are both tied at 6.0%).

2.5 Demographics

2.5.1 Demographic Characteristics

Table 8 presents various demographic characteristics of Spruce Grove from 2011 and compares them with the same for selected municipalities in the Capital Region including Stony Plain and Parkland County. With the exception of Parkland County, the municipalities selected for comparison are those within designated PGAs that are primarily urban in nature.

Table 8: Municipal Comparison of Demographic Characteristics

Demographic Characteristic[14]	Beaumont	Edmonton	Fort Saskatchewan	Leduc	Parkland County	Spruce Grove	St. Albert	Stony Plain	Strathcona County
Median Age of Population	32.3	36.0	35.4	34.0	42.2	33.7	40.2	37.7	39.1
Average Children per Census Family	1.3	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.1
Average Persons in Private Households	3.0	2.5	2.6	2.6	2.8	2.7	2.7	2.5	2.8
Total Occupied Private Dwellings	4,370	324,755	7,330	9,290	10,930	9,620	22,515	5,820	33,130
Low Density Residential Dwellings[15]	4,010	184,625	5,575	6,975	10,900	8,010	18,170	4,395	29,860
Higher Density Residential Dwellings[16]	360	140,135	1,760	2,315	25	1,625	4,340	1,430	3,255
Percent Low Density Residential Dwellings	91.8%	56.9%	76.1%	75.1%	99.7%	83.3%	80.7%	75.5%	90.1%
Percent Higher Density Residential Dwellings	8.2%	43.2%	24.0%	24.9%	0.2%	16.9%	19.3%	24.6%	9.8%
Average Household Total Income in 2010 ($)	117,853	90,340	103,041	100,265	127,864	101,518	121,499	94,330	131,487

This comparison of demographic characteristics reveals that Spruce Grove, among the other compared municipalities in the Capital Region, has:

- the second-lowest median age of the population;
- the second-highest average children per census family (tied with five others);
- the third-highest average persons in private households (tied with St. Albert);
- the fourth-lowest percentage of higher density residential dwellings; and
- the fourth-lowest average household total income in 2010 of all private households.

These observations are indicators that the City of Spruce Grove is a young community that has traditionally attracted families with slightly more modest incomes seeking low density residential housing.

The City's demographic characteristics appear to be most similar to those of Fort Saskatchewan and Leduc from the median age and household income perspectives. These cities are also the two municipalities reviewed that are closest to Spruce Grove in terms of total population. With respect to residential housing composition, Spruce Grove's profile is most similar to St. Albert.

[14] The source of all demographic characteristics is the 2011 federal census as published by Statistics Canada except for average household total income data, which is from the 2011 National Household Survey.
[15] Consists of single detached housing, semi-detached housing and movable dwellings as defined by Statistics Canada in the 2011 federal census.
[16] Consists of all other residential housing structure types as defined by Statistics Canada in the 2011 federal census.

2.5.2 Age and Gender

Figure 5 presents the age and gender of Spruce Grove's population in five-year cohorts based on the 2011 federal census. Figures 6 and 7 present the same for Stony Plain and Parkland County, pro-rated to Spruce Grove's 2011 population of 26,171.

Figure 5: Age and Gender by Five Year Cohorts, Spruce Grove

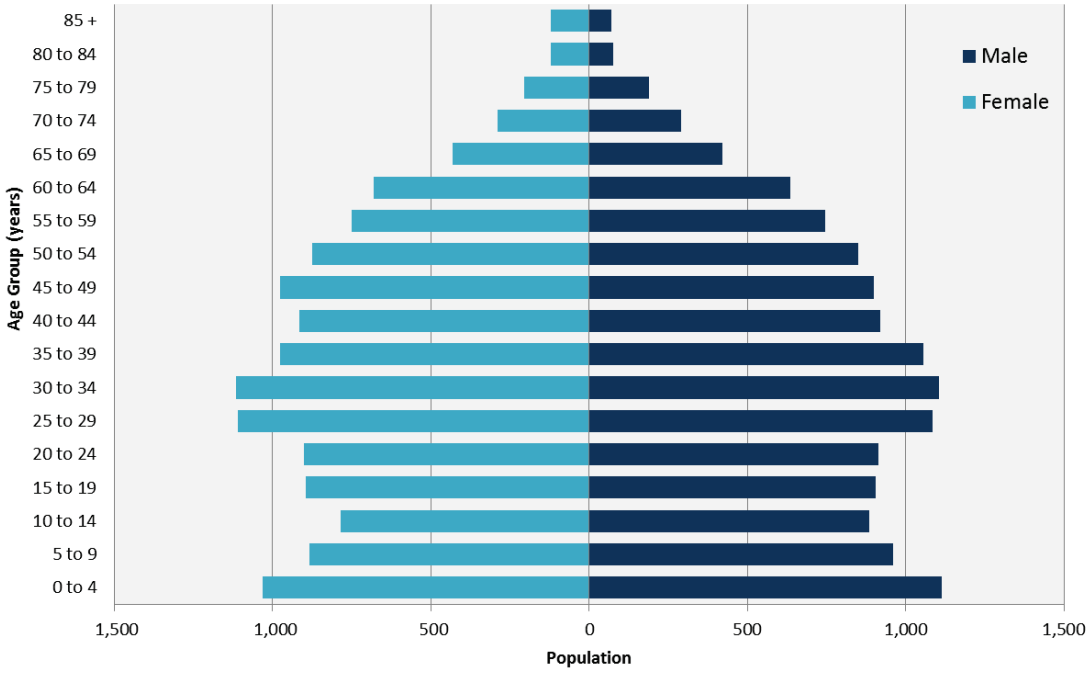


Figure 6: Age and Gender by Five Year Cohorts, Stony Plain

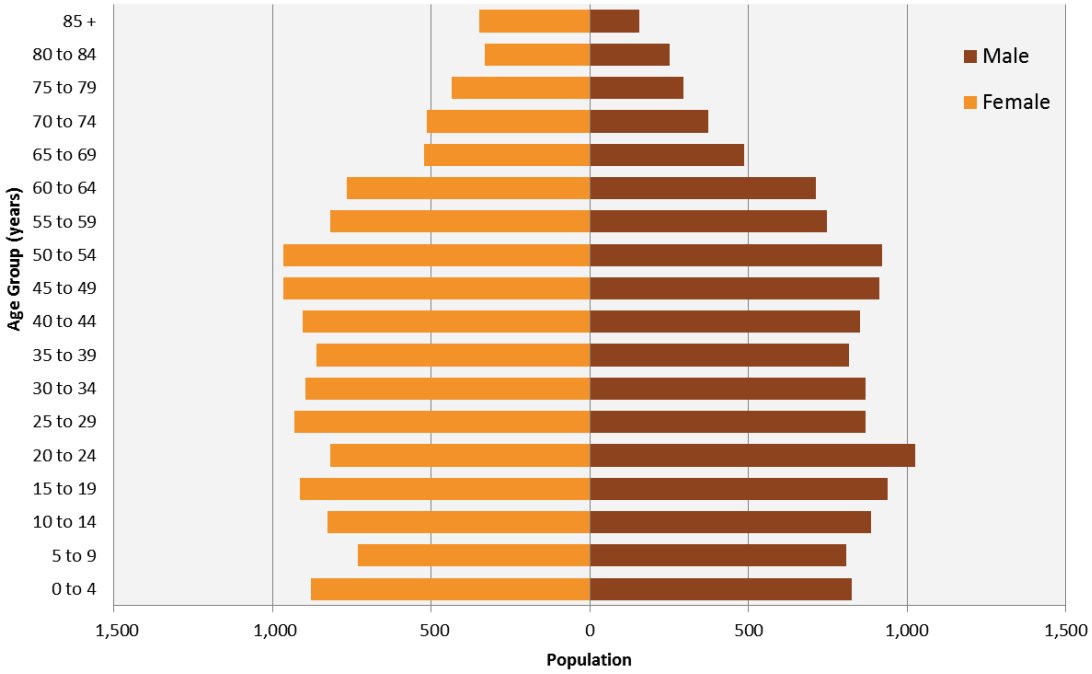
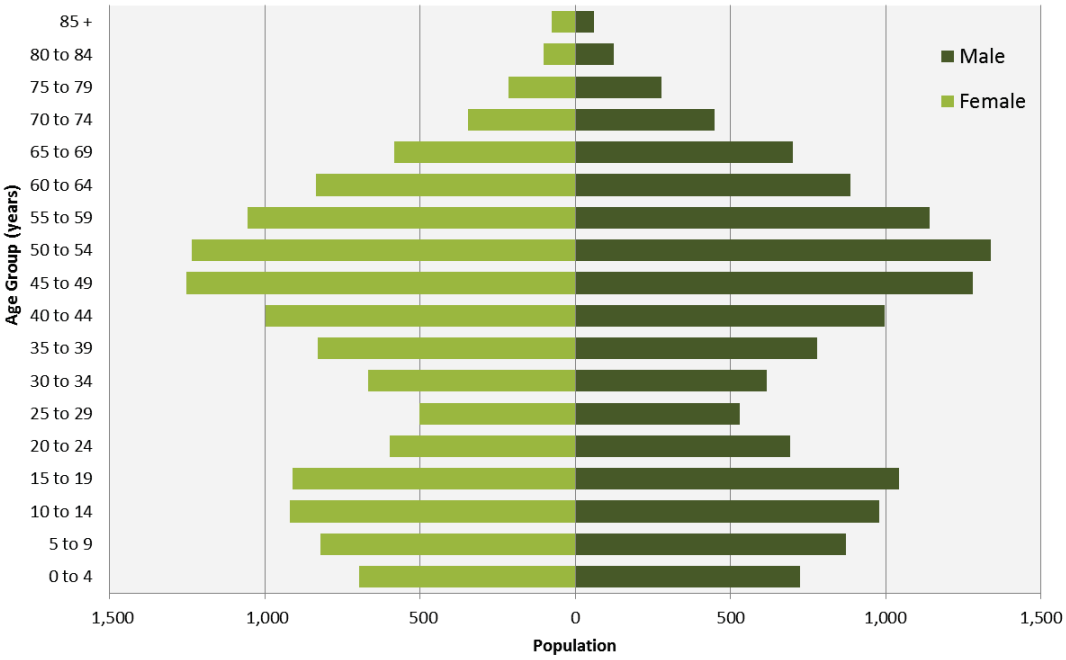


Figure 7: Age and Gender by Five Year Cohorts, Parkland County



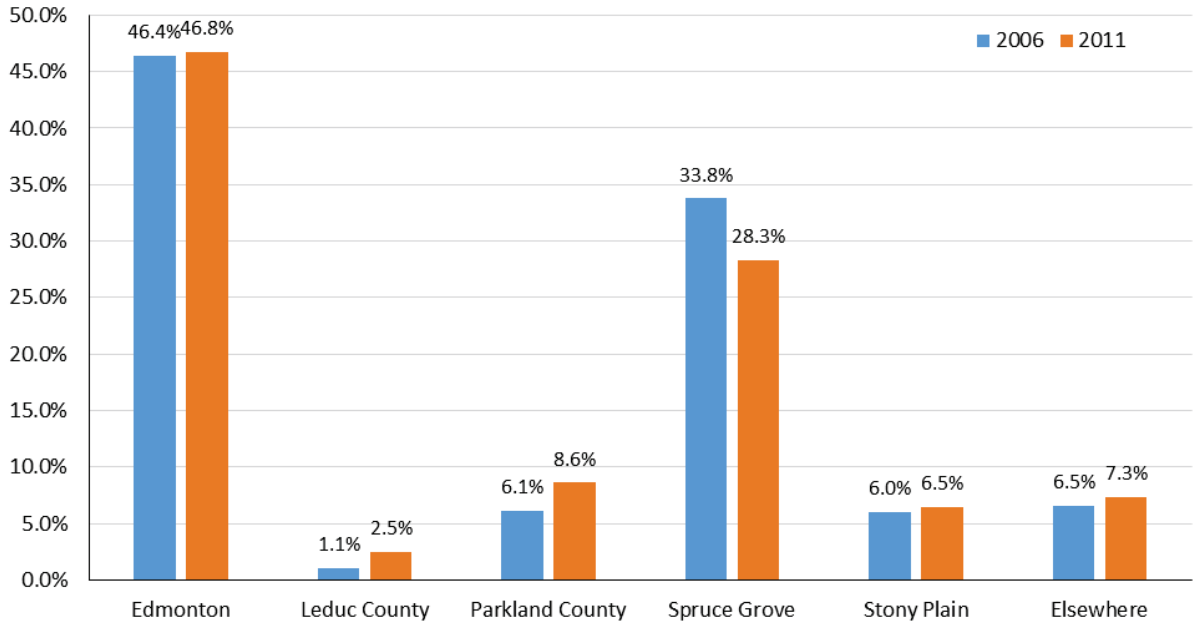
The following are key observations from Figures 5 through 7.

- The City of Spruce Grove has two population bubbles – the 0-4 age cohort and the three cohorts between the ages of 25 through 39 – which suggests Spruce Grove is attractive to young families.
- The Town of Stony Plain's population is fairly evenly distributed among the cohorts between the ages of 0 and 54.
- Parkland County's population has been aging with two significant population bubbles – the two cohorts between the ages of 10 and 19, and the four cohorts between the ages of 40 and 59. The lower populations under the age of 5 and between the ages of 20 through 34 suggests a greater proportion of young families are attracted to other municipalities, while the higher populations over the age of 39 suggest Parkland County attracted older families or "empty nest" households.

2.5.3 Place of Work of the Employed Labour Force

Figure 8 presents the percentages of the usual places of work for Spruce Grove's employed labour force aged 15 years or older from the 2006 Census of Canada and the 2011 National Household Survey. Municipalities presented include Edmonton, Leduc County, Parkland County, Spruce Grove and Stony Plain while an aggregation of other locations elsewhere, including within and beyond the Capital Region, is also presented.

Figure 8: Place of Work of Spruce Grove's Employed Labour Force, 2006-2011



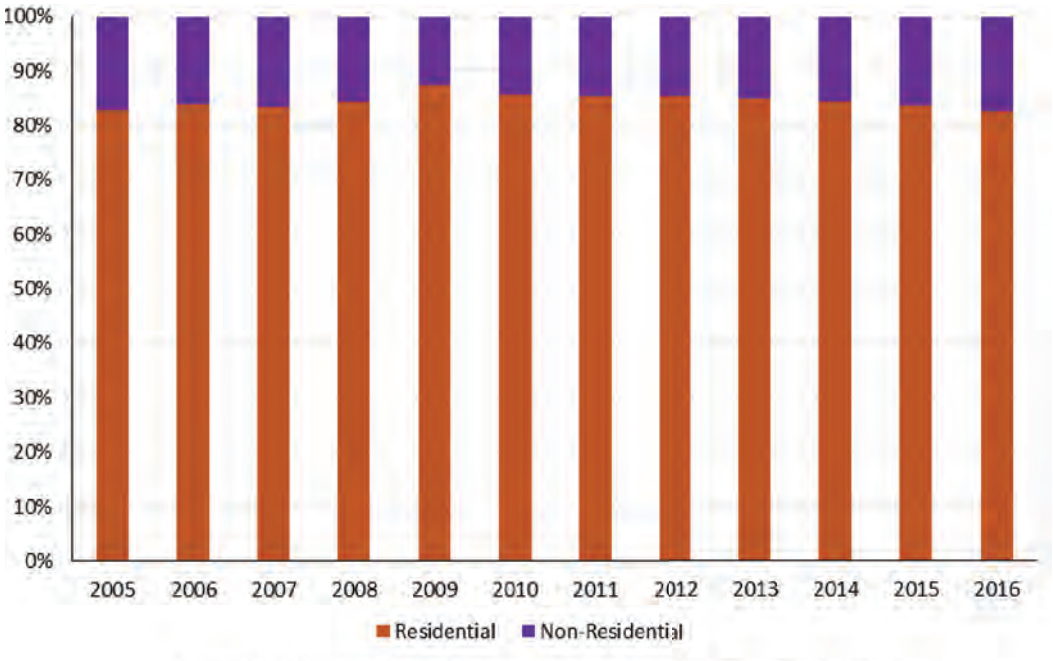
The following are key observations from Figure 8.

- The majority of Spruce Grove's employed labour force commutes to work destinations beyond the City.
- The proportion of Spruce Grove's employed labour force that works within the City is down from 33.8% in 2006 to 28.3% in 2011.
- Of those that commute to work destinations outside Spruce Grove:
  - 46.8% worked in Edmonton in 2011 (up slightly from 46.4% in 2006);
  - 2.5% worked in Leduc County in 2011 (up from 1.1% in 2006);
  - 8.6% worked in Parkland County in 2011 (up from 6.1% in 2006);
  - 6.5% worked in Stony Plain in 2011 (up slightly from 6.0% in 2006); and
  - 7.3% worked elsewhere in 2011 (up from 6.5% in 2006).
- Non-residential growth between 2006 and 2011 in the nearby Acheson Industrial Area within Parkland County and the Nisku Industrial Park/Edmonton International Airport area within Leduc County are likely the greatest contributors to the work commuting destination shifts among Spruce Grove's employed labour force.

2.6 Municipal Assessment Split

Figure 9 presents the historical changes in the City of Spruce Grove's municipal assessment split from 2005 to 2016. The City's municipal assessment split as of 2016 is 82.5% residential[17] to 17.5% non-residential.[18] This is marginally higher than its assessment split in 2005, which was 82.8% residential to 17.2% non-residential. Although this represents only a small increase over 2005, it is a significant increase over the City's 2009 non-residential assessment total of 12.7%. This is in part attributable to the City's successful economic development initiative of marketing the availability of serviced industrial lands within Spruce Grove.

Figure 9: Municipal Assessment Split History, 2005-2016



Source: Alberta Municipal Affairs, Provincial Equalized Assessment Reports, 2005–2016

[17] For the purpose of this analysis, "residential" includes both residential and farmland assessment.
[18] For the purpose of this analysis, "non-residential" includes non-residential (non-regulated), linear property, railway, and machinery and equipment.

Although there has been a trend of consistent, small increases to the City's proportion of non-residential assessment in recent history, it is the City's desire, at minimum, to maintain its current municipal assessment split moving forward to avoid transferring ratepayer tax burden from non-residential operations to residential landowners.

3.0 Population Projections

3.1 Capital Region Board Population Projections

The Capital Region Board (CRB) accepted revised projections for the Capital Region by municipality in late 2013. These projections include "Low" and "High" scenarios that have a 30-year timeframe with 2014 as the base year and 2044 as the horizon year. Table 9 presents the CRB-accepted population projections for the City of Spruce Grove, and CRB-accepted adjustments to those projections based on the City's 2014 municipal census results.

Table 9: CRB Population Projections for Spruce Grove, 2015-2044

	CRB Low Case	CRB High Case	CRB Low Adjusted	CRB High Adjusted
Population in 2015 (Base Year)	29,200	29,200	32,000	32,000
Population in 2044 (Horizon Year)	49,700	67,000	54,500	73,400
Absolute Change (2015 - 2044)	20,500	37,800	22,500	41,400
Percent Change (2015 - 2044)	70	129	70	129
Average Annual Growth Rate (2015 - 2044)	1.9	2.9	1.9	2.9

The following are key observations from Table 9.

- The estimated population of 29,200 for the City of Spruce Grove for 2015 is 9% less than its actual 2015 population of 32,036.
- Spruce Grove fails to double its population within the 30-year timeframe of the "CRB Low" population projection scenario despite the City's most recently having doubled its population over the past 15 years (between 2001 and 2015).
- In the "CRB High" scenario, Spruce Grove's absolute growth is nearly double that of the "CRB Low" scenario.
- Adjustment of the base year population from 29,200 to 32,000 would result in higher populations in the horizon year of 2044 in both scenarios if their average annual growth rates were applied.
- The adjustment of the base year population results in an additional 4,800 residents by 2044 in the "CRB Low" scenario and an additional 6,400 residents in the "CRB High" (populations of 54,500 and 73,400 respectively in 2044).

3.2 Alternative Population Projection Scenarios

Table 10 presents three sets of alternative population growth scenarios – a "Low Case", a "Medium Case" and a "High Case" – prepared for the Growth Study by Metro Economics (formerly Strategic Projections Inc.). Annual estimated population counts and resulting percent changes are presented, while the two rows in grey represent differing horizons – the CRB's horizon of 2044 and the Growth Study's horizon of 2067. The three sets of scenarios in Table 10 are based on the Alberta Treasury Board and Finance (ATBF) Census Division Population Projections for Alberta released in July 2015. As explained in greater detail within Section 3.3, three sets of scenarios were prepared to align with ATBF's approach to publishing its own three sets of scenarios for Alberta's census divisions – low, medium and high scenarios.
Table 11 presents a comparative summary of the three alternative population growth scenarios. The total population changes, the average absolute changes, the overall rates of change, and the average annual

growth rates are presented for all three scenarios over the 2015 to 2067 period. The same information is presented for the shorter 29-year period from 2015 to 2044 to allow for direct comparisons with the CRB-accepted population projections.

Table 10: Alternative Population Projection Scenarios, 2015-2067

Year	Low Case (2015-2044)		Medium Case (2015-2044)		High Case (2015-2044)	
	Pop.	%	Pop.	%	Pop.	%
2015	32,036	—	32,036	—	32,036	—
2016	32,859	2.6	33,074	3.2	33,289	3.9
2017	33,671	2.5	34,144	3.2	34,617	4.0
2018	34,546	2.6	35,336	3.5	36,126	4.4
2019	35,430	2.6	36,595	3.6	37,760	4.5
2020	36,303	2.5	37,860	3.5	39,416	4.4
2021	37,155	2.3	39,089	3.2	41,024	4.1
2022	37,993	2.3	40,303	3.1	42,613	3.9
2023	38,829	2.2	41,528	3.0	44,227	3.8
2024	39,652	2.1	42,748	2.9	45,843	3.7
2025	40,469	2.1	43,971	2.9	47,474	3.6
2026	41,267	2.0	45,185	2.8	49,103	3.4
2027	42,051	1.9	46,394	2.7	50,737	3.3
2028	42,819	1.8	47,596	2.6	52,374	3.2
2029	43,577	1.8	48,800	2.5	54,023	3.1
2030	44,322	1.7	49,999	2.5	55,676	3.1
2031	45,059	1.7	51,202	2.4	57,344	3.0
2032	45,783	1.6	52,401	2.3	59,019	2.9
2033	46,500	1.6	53,604	2.3	60,708	2.9
2034	47,211	1.5	54,812	2.3	62,413	2.8
2035	47,917	1.5	56,024	2.2	64,131	2.8
2036	48,616	1.5	57,242	2.2	65,868	2.7
2037	49,310	1.4	58,468	2.1	67,625	2.7
2038	50,000	1.4	59,699	2.1	69,399	2.6
2039	50,686	1.4	60,941	2.1	71,196	2.6
2040	51,373	1.4	62,197	2.1	73,022	2.6
2041	52,056	1.3	63,463	2.0	74,870	2.5
2042	52,744	1.3	64,707	2.0	76,670	2.4
2043	53,432	1.3	65,951	1.9	78,470	2.3
2044	54,120	1.3	67,195	1.9	80,271	2.3

Year	Low Case (2045-2067)		Medium Case (2045-2067)		High Case (2045-2067)	
	Pop.	%	Pop.	%	Pop.	%
2045	54,808	1.3	68,440	1.9	82,071	2.2
2046	55,496	1.3	69,684	1.8	83,871	2.2
2047	56,184	1.2	70,928	1.8	85,672	2.1
2048	56,872	1.2	72,172	1.8	87,472	2.1
2049	57,560	1.2	73,416	1.7	89,272	2.1
2050	58,248	1.2	74,660	1.7	91,073	2.0
2051	58,936	1.2	75,904	1.7	92,873	2.0
2052	59,624	1.2	77,149	1.6	94,673	1.9
2053	60,312	1.2	78,393	1.6	96,473	1.9
2054	61,000	1.1	79,637	1.6	98,274	1.9
2055	61,688	1.1	80,881	1.6	100,074	1.8
2056	62,376	1.1	82,125	1.5	101,874	1.8
2057	63,064	1.1	83,369	1.5	103,675	1.8
2058	63,752	1.1	84,613	1.5	105,475	1.7
2059	64,440	1.1	85,858	1.5	107,275	1.7
2060	65,128	1.1	87,102	1.4	109,076	1.7
2061	65,816	1.1	88,346	1.4	110,876	1.7
2062	66,504	1.0	89,590	1.4	112,676	1.6
2063	67,192	1.0	90,834	1.4	114,476	1.6
2064	67,880	1.0	92,078	1.4	116,277	1.6
2065	68,568	1.0	93,323	1.4	118,077	1.5
2066	69,256	1.0	94,567	1.3	119,877	1.5
2067	69,944	1.0	95,811	1.3	121,678	1.5

Table 11: Alternative Population Projection Scenarios Comparative Summary, 2015-2067

	Growth Study			CRB Adjusted	
	Low Case	Medium Case	High Case	Low Case	High Case
Absolute Change (2015-2067)	37,908	63,775	89,642	—	—
Average Absolute Change (2015-2067)	729	1,226	1,724	—	—
Percent Change (2015-2067)	118%	199%	280%	—	—
Average Annual Growth Rate (2015-2067)	1.5%	2.1%	2.6%	—	—
Absolute Change (2015-2044)	22,084	35,159	48,235	22,500	41,400
Average Absolute Change (2015-2044)	762	1,212	1,663	776	1,428
Percent Change (2015-2044)	69%	110%	151%	70%	129%
Average Annual Growth Rate (2015-2044)	1.8%	2.6%	3.2%	1.9%	2.9%

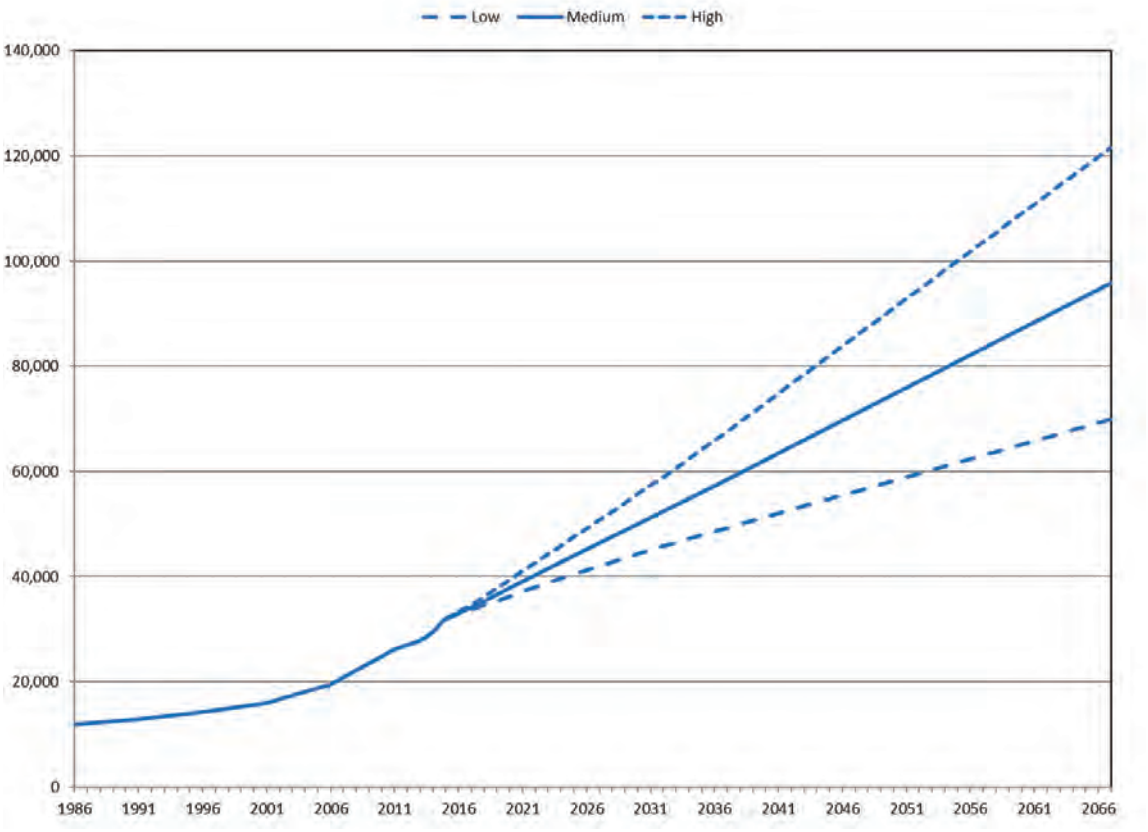
3.3 Projection Scenario Assumptions

Spruce Grove is one of 50 municipalities that together define Census Division (CD) No. 11 in Alberta. The City's share of CD No. 11's population has increased since 2001. In 2001, Spruce Grove's population of 15,983 represented 1.59% of CD No. 11's population. Its share then increased to 2.09% in 2011 and more recently to 2.29% in 2015. The City's absolute growth of 16,053 between 2001 and 2015 accounted for 4.03% of the CD No. 11's population growth over this 14-year period and for 4.42% of its growth over the 2007 to 2015 period.

The ATBF projections for CD No. 11 – which extend only to 2041 – are based on post-censal estimates of the population. The ATBF projections foresee CD No. 11's total population increasing to 2,143,850 by 2041 at an average annual absolute rate of 28,598. In order to extend that projection to 2067, Metro Economics assumed the 28,592 annual pace would continue through to the projection horizon thus taking CD No. 11's total population in that year to 2,887,385. This projection serves as the basis for the development of the "Medium Case" projection for Spruce Grove illustrated in Figure 10. To develop the "Medium Case" projection for Spruce Grove it was assumed the City would accommodate on average 4.35% of CD No. 11's projected growth where 4.35% reflects a share slightly below that achieved by the City between 2007 and 2015.

Metro Economics developed "High Case" and "Low Case" alternative projections for CD No. 11 assuming the City would achieve 4.35% of CD No. 11's growth each year using the ATBF's "High" and "Low Case" projections for CD No. 11 extended to 2067.

Figure 10: Spruce Grove Historical and Projected Population, 1986-2067



Source: Statistics Canada and Metro Economics

3.3.1 Low Case Scenario

In the "Low Case" Scenario, Spruce Grove:

- experiences an average annual rate of growth over the 52-year (2015 to 2067) period of 1.5% (see Table 11);
- experiences a total population increase of 37,908 for an overall increase of 118% over that span (see Table 11);
- experiences an average absolute change of 729 new residents per year (see Table 11); and
- doubles its population by 2059.

3.3.2 Medium Case Scenario

In the "Medium Case" Scenario, Spruce Grove:

- experiences an average annual rate of growth over the 52-year (2015 to 2067) period of 2.1% (see Table 11);
- experiences a total population increase of 63,775 for an overall increase of 199% over that span (see Table 11);
- experiences an average absolute change of 1,226 new residents per year (see Table 11); and
- doubles its population by 2042.

3.3.3 High Case Scenario

In the "High Case" Scenario, Spruce Grove:

- experiences an average annual rate of growth over the 52-year (2015 to 2067) period of 2.6% (see Table 11);
- experiences a total population increase of 89,642 for an overall increase of 280% over that span (see Table 11);
- experiences an average absolute change of 1,724 new residents per year (see Table 11);
- doubles its population by 2035; and
- triples its population by 2053.

3.4 Projection Scenario Recommendations

The "Low Case" is not recommended as it reflects a pace of growth well below that achieved over the last decade and a half, and barely matches the adjusted "Low" projection put forward by the CRB. Furthermore, it calls for the City's population to take more than four decades to double when it has taken only 15 years to double since 2001.

The "High Case" requires the City's population growth to match that achieved over the last 15 year period for a sustained period of 55 years. While such a high pace may be possible for some time, it may not be sustained through to 2067.

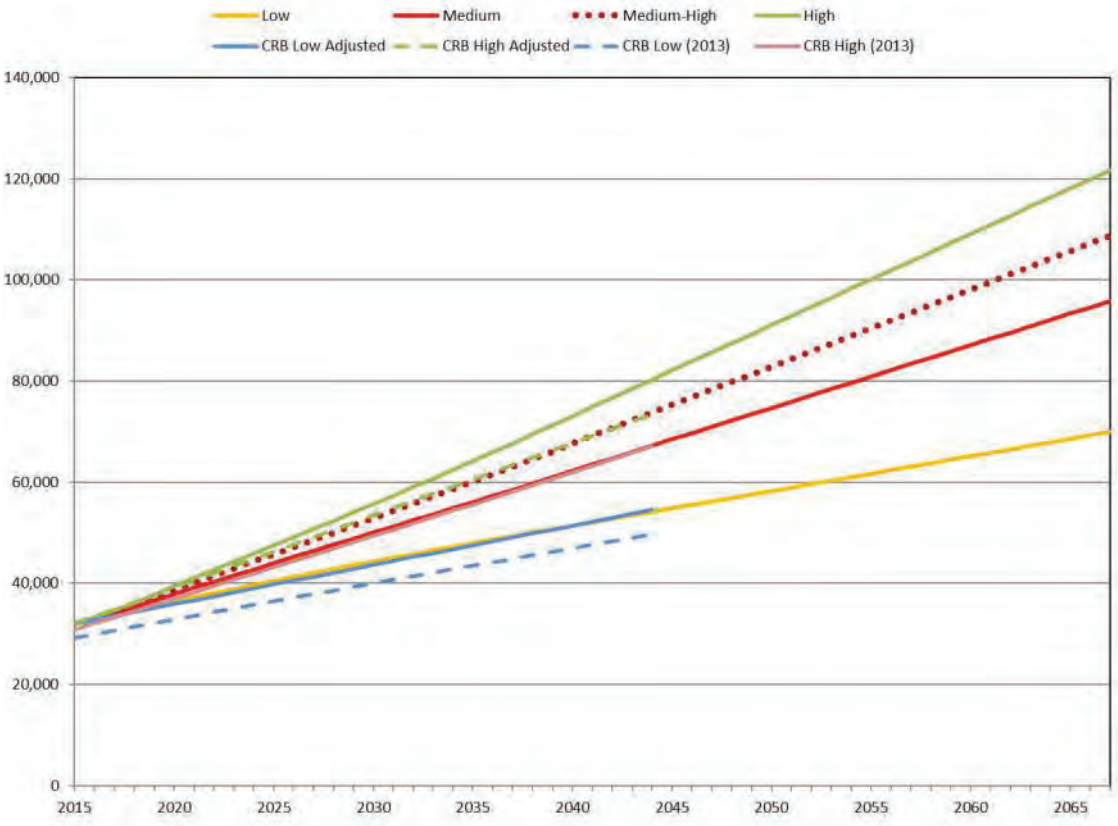
The "Medium Case" is a conservative growth scenario for Spruce Grove. The pace reflected in this scenario takes the population of Spruce Grove along a path that is slightly higher than midpoint between the CRB's adjusted "Low" and "High Case" alternative projections to 2044. However, the scenario is not reflective of the growth trends and development pressures experienced by the City of Spruce Grove now and in recent years. Despite the current downturn in the provincial economy, the City's 2016 municipal census population count of 33,640 has significantly outpaced the "Medium Case" Scenario's projected population of 33,074 by 55% or 566 new residents. Instead, to enable proper planning for more realistic and achievable growth, a "Medium-High Case" Scenario is recommended for the purpose of this study.

3.4.1 Medium-High Case Scenario

The "Medium-High Case" Scenario is derived from the midpoint between the "Medium Case" and "High Case". It generally matches the path of the "CRB High" Scenario that has been applied by the Capital Region Board in the recently approved Edmonton Metropolitan Region Growth Plan (EMRGP). The CRB used the "CRB High Adjusted" Scenario in the EMRGP to inform regional land requirements to 2044 and its metropolitan structure to 2044 including the conceptual boundaries of the Metropolitan Area policy tier. The "Medium-High Case" Scenario population projections are presented in Table 12, while it is visually compared with this study's three other scenarios and the original and adjusted CRB "High" and "Low" projection alternatives in Figure 11. More specifically in the "Medium-High Case" Scenario, Spruce Grove:

- experiences an average annual rate of growth over the 52-year (2015-2067) period of 2.4%;
- experiences a total population increase of 76,708 for an overall increase of 239% over that span;
- experiences an average absolute change of 1,475 new residents per year;
- doubles its population by 2038; and
- triples its population by 2059.

Figure 11: Comparison of Population Projection Scenarios



Source: Capital Region Board and Metro Economics

Table 12: Medium-High Case Population Projection Scenario, 2015-2067

Year	Medium-High Case (2015-2044)	
	Pop.	%
2015	32,036	—
2016	33,182	3.6
2017	34,380	3.6
2018	35,731	3.9
2019	37,177	4.0
2020	38,638	3.9
2021	40,057	3.7
2022	41,458	3.5
2023	42,877	3.4
2024	44,295	3.3
2025	45,723	3.2
2026	47,144	3.1
2027	48,565	3.0
2028	49,985	2.9
2029	51,411	2.9
2030	52,837	2.8
2031	54,273	2.7
2032	55,710	2.6
2033	57,156	2.6
2034	58,612	2.5
2035	60,078	2.5
2036	61,555	2.5
2037	63,046	2.4
2038	64,549	2.4
2039	66,069	2.4
2040	67,610	2.3
2041	69,166	2.3
2042	70,689	2.2
2043	72,211	2.2
2044	73,733	2.1

Year	Medium-High Case (2045-2067)	
	Pop.	%
2045	75,255	2.1
2046	76,778	2.0
2047	78,300	2.0
2048	79,822	1.9
2049	81,344	1.9
2050	82,866	1.9
2051	84,389	1.8
2052	85,911	1.8
2053	87,433	1.8
2054	88,955	1.7
2055	90,478	1.7
2056	92,000	1.7
2057	93,522	1.7
2058	95,044	1.6
2059	96,566	1.6
2060	98,089	1.6
2061	99,611	1.6
2062	101,133	1.5
2063	102,655	1.5
2064	104,178	1.5
2065	105,700	1.5
2066	107,222	1.4
2067	108,744	1.4

4.0 Status of City Lands

4.1 Land Supply (2014)

The City of Spruce Grove's current land base amounts to 3,166.4 hectares (ha). As summarized in Table 13 and illustrated in Map 3, 2,012.0 ha (63.5%) of its land base was absorbed as of the end of 2014. This includes lands consumed for:

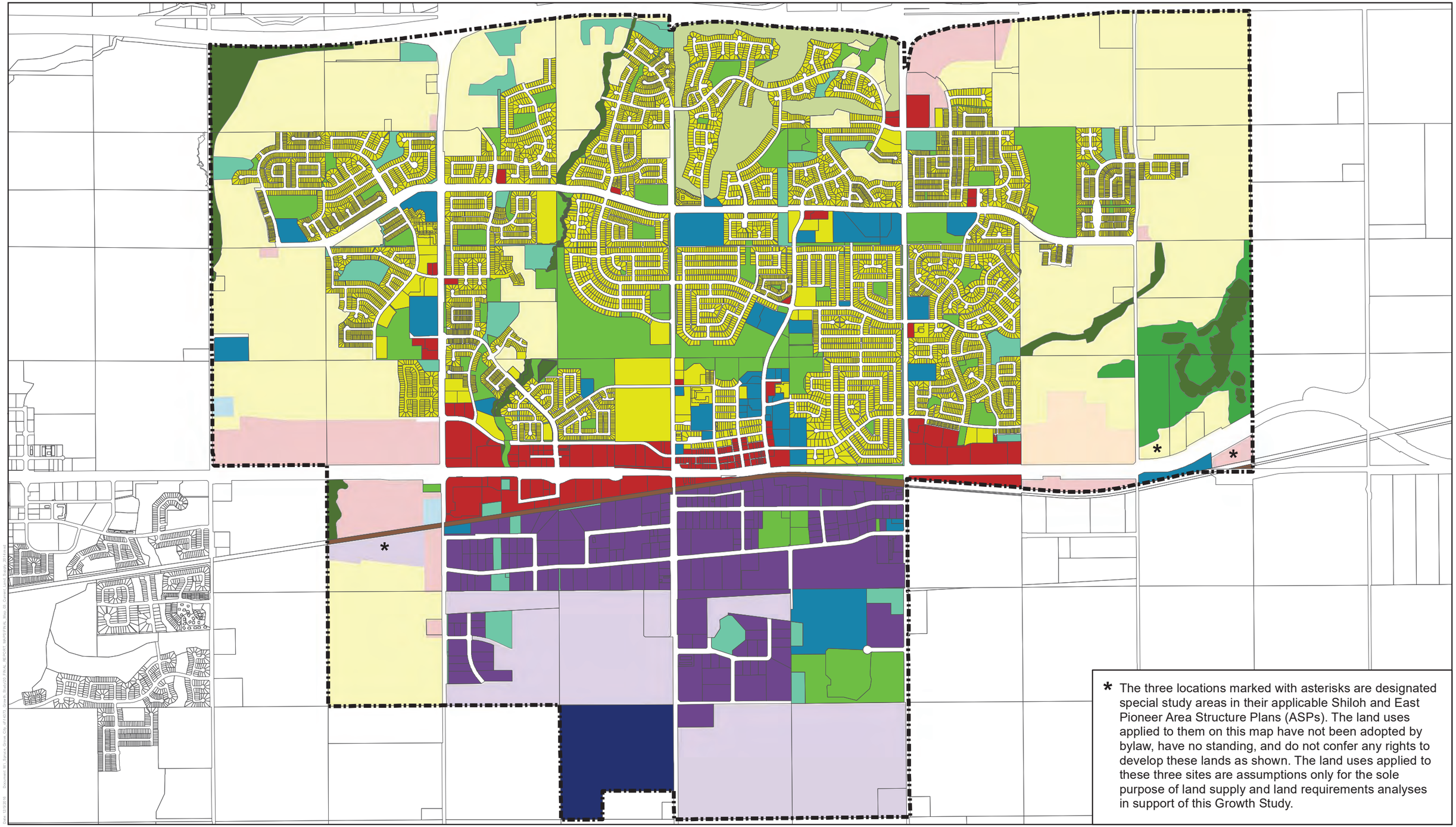
- the four core land uses (residential, commercial, industrial and public services),
- developable overhead land uses (parks and open space, public utilities and circulation) and
- other unique land uses (environmental reserve, golf course, the NAIT campus and railway).

The amount of gross developable land for the four core land uses within the current City limits that were available for future development at the end of 2014 totaled 1,148.6 ha, or 36.3% of the City's total land base. This breaks down to 758.9 ha for residential, 129.9 ha for commercial, 255.4 ha for industrial and 4.4 ha for public services.

Table 13: Land Supply Analysis, Absorbed and Available Lands, 2014

Land Use	Absorbed Land Supply[19]		Available Land Supply[20]			
	ha (net)	Pct	ha (gross)	Pct	ha (net)	Pct
Total Gross Area	**2,012.0**	**–**	**1,148.6**	**–**	**1,148.6**	**–**
Environmental Reserve	62.9	–	–	–	–	–
Golf Course	58.6	–	–	–	–	–
NAIT Campus	54.2	–	–	–	–	–
Natural Area	45.7	–	–	–	–	–
Railway	13.1	–	–	–	–	–
Total Developable Lands	**1,777.7**	**100.0%**	**1,148.6**	**100.0%**	**1,148.6**	**100.0%**
Residential	615.4	34.6%	758.9	66.1%	478.1	41.6%
Commercial	101.6	5.7%	129.9	11.3%	81.9	7.1%
Industrial	239.5	13.5%	255.4	22.2%	160.9	14.0%
Public Services	97.2	5.5%	4.4	0.4%	2.8	0.2%
Total Core Land Uses	**1,053.7**	**59.3%**	**1,148.6**	**100.0%**	**723.6**	**63.0%**
Parks and Open Space	210.8	11.9%	–	–	137.8	12.0%
Public Utilities	83.4	4.7%	–	–	57.4	5.0%
Circulation	429.9	24.2%	–	–	229.7	20.0%
Total Developable Overheads	**724.0**	**40.7%**	**–**	**–**	**425.0**	**37.0%**

[19] For the purpose of this study, **absorbed land supply** is defined as lands zoned under the land use bylaw (LUB) and subdivided for development.
[20] For the purpose of this study, **available land supply** is defined as lands not yet zoned and/or subdivided for development, and is based on LUB districting, approved area structure plan land use designations, and future land use identified in the municipal development plan, etc.



* The three locations marked with asterisks are designated special study areas in their applicable Shiloh and East Pioneer Area Structure Plans (ASPs). The land uses applied to them on this map have not been adopted by bylaw, have no standing, and do not confer any rights to develop these lands as shown. The land uses applied to these three sites are assumptions only for the sole purpose of land supply and land requirements analyses in support of this Growth Study.

ISL Engineering and Land Services

0 250 500 1,000 1,500 metres

- Residential
- Commercial
- Industrial
- Public Services
- Public Utilities
- Parks and Open Space
- Environmental Reserve
- Natural Area
- Golf Course
- NAIT Campus
- Railway
- Available Residential
- Available Mixed Use
- Available Commercial
- Available Industrial
- Available Public Services
- City Boundary
- Parcel

N

1:25,000

The City of SPRUCE GROVE

GROWTH STUDY • MAP 3
CURRENT LAND SUPPLY, 2014

It should be noted that the amount of land remaining for public services is understated at 4.4 ha. Future lands for public services are not often made available until the subdivision stage. As public service uses can be compatible with and located within all of the three other core land uses, the City's residential, commercial and industrial land supplies can be reasonably expected to provide additional public services land supply at the various subdivision stages over time for uses such as fire halls, community centres, schools and churches.

By subtracting an assumed 37%[21] of the gross available lands for developable overheads, the net amount of land available for residential, commercial, industrial and public services development within the current City limits totals 723.6 ha. This is the equivalent of 22.9% of the City's total land base.

4.2 Adjusted Land Supply (2015)

During the course of 2015, one road plan and 18 terminal subdivision plans were registered that depleted 63.9 ha of the City's available land supply. Thus, 5.6% of the City's 1,148.6 ha of gross developable land supply was consumed resulting in an adjusted gross developable land supply of 1,084.7 ha as of the end of 2015. The effects of this depletion by core land use are listed below.

- The City's gross residential land supply was reduced by 39.6 ha from 758.9 ha to 719.3 ha.
- The City's gross commercial land supply was unaffected by the plans registered in 2015.
- The City's gross industrial land supply was reduced by 21.6 ha from 255.4 ha to 233.6 ha.
- The City's gross public services land supply was reduced by 2.7 ha from 4.4 ha to 1.7 ha.

4.3 Estimated Years to Land Supply Depletion

Table 14 presents the estimated years to land supply depletion from the end of 2014 under three projection scenarios if the City of Spruce Grove was to decide to maintain its current boundaries. For the purpose of this estimation, the remaining public services land supply has been apportioned 75% to the residential land supply and 25% to the industrial land supply based on the current distribution of the City's absorbed public services land supply.

The estimated years to depletion in Table 14 is based on the estimated annual consumption of the remaining unabsorbed land within the City. In general, a land requirements model is used to determine the annual consumption of land by land use type for each scenario. Within the model, it is assumed that 100% of the annual land requirements by land use type occurs in the City before eventually being pushed outside the City's boundary.

[21] This 37% dedution assumes 12% for parks and open space (municipal and school reserves), 5% for public utilities and 20% for circulation (local and collector roads). The maximum amount a municipality could require for these deductions at the subdivision stage under the Municipal Government Act (MGA) is 40%, including the maximum deduction for municipal and school reserves of 10%. The remaining 2% is a reflection of the current state of parks and open space in Spruce Grove. It is assumed the City will continue to acquire an addition 2% through means other than dedication at the subdivision stage.

Table 14: Years to Land Supply Depletion from 2014 by Scenario

Land Use	Medium Case			High Case			Recommended Medium-High Case		
	Year Depleted	Years to Depletion	Average ha/year	Year Depleted	Years to Depletion	Average ha/year	Year Depleted	Years to Depletion	Average ha/year
Residential (including 75% Public Services)	2041	26	29	2035	20	39	2038	23	34
Commercial	2045	30	4	2038	23	6	2041	26	5
Commercial (excluding unmotivated owners)	2029	14	4	2026	11	6	2027	12	5
Industrial (including 25% Public Services)	2038	21	11	2033	18	15	2035	20	13
Total Average ha/year	–	–	**44**	–	–	**60**	–	–	**52**

As presented in Table 14, it will take 23 years (2038) for the City's residential land supply to be depleted under the recommended "Medium-High Case" Scenario based on the available land supply estimates from Table 13. In terms of non-residential development, it will take 26 years (2041) and 20 years (2035) for the City's commercial and industrial land supplies respectively to be depleted under the "Medium-High Case" Scenario. When excluding the unmotivated commercial landowners, the commercial land supply drops to 12 years. Under the "High Case" Scenario, the estimated years of land supply depletion vary from 18 to 23 years depending on land use (11 years commercial excluding unmotivated landowners), while the estimation under the "Medium Case" Scenario varies from 21-30 years (14 years for commercial excluding unmotivated landowners).

4.4 Adjusted Estimated Years to Land Supply Depletion

As Tables 13 and 14 are based on the status of land supply as of the end of 2014, the estimated years to land supply depletion under the recommended "Medium-High Case" Scenario have been adjusted to the following to reflect the registration of the one road plan and 18 terminal subdivision plans over the course of 2015 as presented in Section 4.2.

- Depletion of the residential land supply within 22 years in 2037 (includes 75% public services)
- Depletion of the commercial land supply within 26 years in 2041 (no change from Table 14)
- Depletion of the industrial land supply within 18 years in 2033 (includes 25% public services)

4.5 Historical Land Absorption

An historical land absorption analysis enables an understanding of how land has been consumed through the plan registration process over a certain period of time. Extrapolation of the results allows the estimation of the earliest time in which all available lands could be absorbed under two key assumptions – that there will be flexibility of land use among the City's remaining available lands (unlike the situation in Section 4.2 above, which is based on current available land supply by land use), and that all owners of the available lands will participate in development. For the purpose of this Growth Study, Spruce Grove's historical land absorption analysis was undertaken by calculating the total area of all plans registered over the past 40 years in 10-year intervals.

As illustrated in Map 4 and presented in Table 15, the average amount of lands absorbed annually between 2005 and 2014 was 63.3 ha (or one quarter section per year), while the annual average between 1975 and 2014 was 34.8 ha (0.55 quarter sections per year). With a gross developable land supply of 1,148.6 ha (Table 13), it will take 18 years to absorb these lands through plan registration based on the assumption that the recent 10-year rate of 63.3 ha per year remains constant.

pre-1975
1975-1979
1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2009
2010-2014
Other Absorbed Lands
City Boundary
Parcel

ISL Engineering and Land Services

0 250 500 1,000 1,500 metres

N

1:25,000

The City of SPRUCE GROVE

GROWTH STUDY • MAP 4
HISTORICAL LAND ABSORPTION, 2014

Table 14 presented in Section 4.3 above estimates an average absorption of 52 ha per year, which is just above the midpoint of the 10-year and 40-year land absorption trends of 34.8 and 63.3 ha per year respectively. It will take 22 years to absorb the City's remaining land supply assuming an annual land consumption rate of 52 ha per year.

Table 15: Historical Land Absorption since 1975

Time Period	Area (ha)	Quarter Sections	Area (ha) per Year	Quarters per Year
1975-1984	353.5	5.57	35.4	0.56
1985-1994	165.7	2.61	16.6	0.26
1995-2004	237.6	3.74	23.8	0.37
2005-2014	633.5	9.98	63.3	1.00
1975-2014	**1,390.3**	**21.89**	**34.8**	**0.55**
2015	63.9	1.01	63.9	1.01

Further to the above observations, Table 15 also presents the amount of land absorbed through plan registration in 2015. The City witnessed the absorption of 63.9 ha or one quarter section of its gross available land supply in 2015, which is a continuation of the City's average absorption between 2005 and 2014 inclusive.

4.6 Residential Lands

As presented previously in Table 13, the City had a gross residential land supply of 758.9 ha (net 478.1 ha) at the end of 2014 to accommodate population growth. By the end of 2015, a further 39.6 gross ha (5.2%) has been depleted through the registration of subdivision plans. As noted in Section 4.4, these lands will be consumed within 22 years (in 2037) under the "Medium-High Case" Scenario and 75% of future public services land requirements are captured within the City's available residential land supply.

It is prudent that a future growth strategy be initiated in the short-term to maintain a 50-year residential land supply in the City. This is necessary before the supply is depleted to a level where there is a minimal number of residential developers remaining and/or where a significant amount of the remaining available residential lands are held by unmotivated landowners. This is not a desirable position for a high growth community such as Spruce Grove, as it gives these parties a disproportionately high level of control over the market. This in turn can compromise the affordability of the new residential housing market for the end user and negatively affect the community's ability to optimize its growth potential. The City therefore needs to provide a sufficient residential land supply to develop housing to accommodate the population growth projected in the "Medium-High Case" Scenario.

4.7 Commercial Lands

As of the end of 2014, the City's commercial land base available for subdivision totaled 129.9 gross ha (81.9 net ha) as noted in Table 13, which according to Table 14 will be depleted within 26 years (by 2041) under the "Medium-High Case" Scenario.

The City advises that the landowners of the available commercial lands on the west side of Spruce Grove, on either side of Highway 16A, have not brought their lands onto the market in recent history despite the availability of adjacent servicing. Businesses have desired developing in these locations but have been turned away resulting in missed commercial development opportunities for the City. Excluding these lands, the City's commercial land supply will be depleted within 12 years (by 2027) under the "Medium-High Case" Scenario.

It is also observed that the available commercial land supply on the south side of Highway 16A in the east portion of the City may have reduced marketability due to servicing constraints associated with shallow depths between the highway and the rail line, as well as limitations on highway access east of Pioneer Road (Range Road 271). Combined, the above-mentioned lands account for 63% (83.3 gross ha) of the City's current available commercial land supply.

It is prudent that a future growth strategy be initiated in the short-term to provide additional opportunities to accommodate commercial growth in the short and medium-terms to serve the City's growing population. This need will become more critical as the available commercial lands at the southeast corner of Highway 16 and Century Road and at the northwest corner of Highway 16A and Pioneer Road are depleted in the coming years, especially if there continues to be little or no movement on the available commercial land supply on the west side of the City.

4.8 Industrial Lands

As of the end of 2014, the City of Spruce Grove had 255.4 gross ha (160.9 net ha) of industrial land available for subdivision as noted in Table 13. By the end of 2015, a further 21.6 gross ha (8.5%) has been depleted through the registration of subdivision and road plans. As noted in Section 4.4, the remaining available industrial lands will be depleted within 18 years (in early 2033) under the "Medium-High Case" Scenario and 25% of future public services land requirements are captured within the City's available industrial land supply.

It is prudent that a future growth strategy be initiated in the short-term to maintain a 50-year industrial land supply in the City before its supply gets depleted to the level where there are only a minimal number of industrial developers remaining and/or where a significant amount of the remaining available industrial lands are held by unmotivated landowners. As is the case with the residential supply, this is not a desirable position for a high growth community like Spruce Grove. Such a scenario gives these parties a disproportionately high level of control over the market. This in turn can compromise the affordability of the industrial land sales and leasing markets for the end user and thereby affect the City's ability to capture its industrial growth potential and compromise its ability to maintain its current residential/non-residential assessment split. The City therefore needs to provide sufficient industrial land supply to accommodate employment growth proportional to the population growth projected in the "Medium-High Case" Scenario.

4.9 Public Services

Although Table 13 presents that Spruce Grove only had 4.4 gross ha (2.8 net ha) of available public services land supply at the end of 2014 (or 1.7 gross ha at the end of 2015), it is assumed that portions of the gross developable overheads will accommodate some of these uses (e.g., schools on municipal reserve sites). As mentioned previously, the amount of land remaining for public services in the City is understated as future lands for public services are not often made available until the subdivision stage. The remaining public services land requirements are anticipated to be interspersed throughout future growth areas at future subdivision approval stages as facilities such as churches, fire stations, libraries, civic buildings, etc. More specifically, it is assumed that 75% of the public services land requirements will be captured within residential growth areas while 25% will be captured within industrial growth areas.

5.0 Study Area Analysis

5.1 Topography

The topography of the study area[22] is illustrated in Map 5. Lands within the north portion of the study area slope from west to east. The highest point is 700 m above sea level (ASL) on lands immediately north of the Town of Stony Plain, while the lowest point is 655 m ASL in the extreme northeast corner of the study area.

Lands within the south portion of the study area generally slope from south to north, with the highest point being at 730 m ASL and drainage running north through Spruce Grove to Highway 16 to the lowest point of 665 m ASL in the northeast. Slopes are more gradual on lands east of Spruce Grove, where the highest elevation is 715 m ASL for much of the area.

5.2 Watercourses

Map 6 illustrates the watercourses that are present within the study area. Watercourse delineations are from the GeoGratis National Hydro Network published by Natural Resources Canada.

Atim Creek is the principle watercourse that meanders through the study area. It flows south to north through the east portion of the Town of Stony Plain and cuts through the extreme northwest corner of the City of Spruce Grove before crossing Highway 16. After crossing the highway, it flows in a northeasterly direction passing just north of Parkland Village before exiting the study area. Atim Creek eventually empties into Big Lake 3.0 km (1.9 mi) northeast of the northeast corner of the study area.

Dog Creek is a watercourse that travels south to north through the wet portion of Spruce Grove. It originates near the intersection of Highway 628 and Calahoo Road (Range Road 273) south of the City. After crossing Highway 16 A, it flows east and passes south of Parkland Village and empties into Atim Creek shortly after exiting the study area.

Morgan Creek is a third south to north flowing watercourse that bisects the west portion of the Acheson Industrial Area. It passes through the east portion of the Wagner Natural Area and empties into Atim Creek to the northeast of the study area.

In addition to these three creeks, there are also a number of other unnamed watercourses that flow through the study area. The majority of these are present within Stony Plain and the northwest and north portions of the study area within Parkland County. In the east, two watercourse empty into Dog Creek. One originates in the east portion of Spruce Grove and flows in a northeast direction while the other originates south of Highway 16A and flows north just east of the City's eastern boundary and through the northwest corner of the Wagner Natural Area.

5.3 Wetlands

Map 7 illustrates four types of wetlands within the study area according to AESRD's Alberta Merged Wetland Inventory (AMWI). The types include swamps, fens, marshes and open water.

The majority of marshes and swap areas in the study area are located north and east of Spruce Grove and to the north of Stony Plain. The most significant of these is the Wagner Natural Area located south of

[22] For the purpose of this analysis, that portion of the study area located outside the boundaries of Spruce Grove and Stony Plain is divided into two pieces:
North = all lands located north of the Stony Plain boundary and north of Highway 16;
South = all lands located south and east of the Spruce Grove boundary and south of Highway 16.

Highway 16 and east of Spruce Grove. Much of the identified marsh and swamp areas are located within the Town of Stony Plain corporate limits.

There are comparatively few wetland areas located in the southeast portion of the study area. The majority of the wetlands present are identified as marsh.

There are no fen areas identified in the study area, and areas of open water are confined to isolated pockets located north of Highway 16.

AMWI Disclaimer

Note that the AMWI was stitched together from multiple sources by AESRD. As such, the methodologies and levels of detail may vary from source to source. This may contribute to why:

- there are marshes identified at two locations that correspond to sewage lagoon facilities;
- there appears to be fewer wetlands within the southwest portion of the study area compared to the rest of the study area; and
- the wetland in the City's East Pioneer area is not identified whatsoever.

The wetlands from the AMWI should therefore only be considered a high level overview of potential wetlands within the study area. A desktop review of wetlands present within the study area is presented in Appendix A.

East Pioneer Wetland Complex and Fen

Although the AMWI did not identify any fen areas within the study area, the Wetland Desktop Review in Appendix A identified a wetland complex and fen in the East Pioneer area annexed to the City of Spruce Grove in 2007. In support of that annexation, the City commissioned an environmental review of a 102 ha (262 ac) study area that included this wetland complex and fen. The subject lands are outside of the Wagner Natural Area Recharge Zone and are instead located within an identified groundwater discharge area.

The City's environmental review reported that 83% of the subject lands had a water table ranging from "within 50 cm of the soil surface for part of the year" to being "at or above the soil surface for much or all of the year." It therefore concluded that only 17% "would be suitable for future housing developments" and recommended that the area be protected from further development.[23]

As a result of these findings, the majority of the subject lands was delineated as a combination of environmental reserve and natural area for protection within the City's current land supply (refer to Map 3). To date, the wetland complex and fen are not yet provincially protected. The City will be exploring opportunities in the future to assure protection of this natural area.

Wagner Natural Area and Recharge Zone

The Wagner Natural Area, as illustrated on Map 7, is a provincially owned and protected natural area in the northeast portion of the study area on the south side of Highway 16 between Highway 44/Township Road 531A to the east and Range Road 270 to the west. At 221 ha (546 ac) in size, the Wagner Natural Area features various habitats including "calcareous fens and marl ponds, willow swamps, drier coniferous and deciduous forests, creeks, and hay fields."[24] The Acheson Industrial Area Structure Plan (ASP) states:

> "the Wagner Natural Area comprises a rich and diverse array of fauna and flora. Its distinctiveness is due in part to the mineral springs that flow year round at a relatively constant temperature and creates a microclimate which favors plants and animals unique to the area. These springs are fed by

[23] Source: Environmental Review of Potential Annexation Area, May 27, 2005 (Timberline Forest Inventory Consultants).
[24] Source: Wagner Natural Area Society website, http://www.wagnerfen.ca/

ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

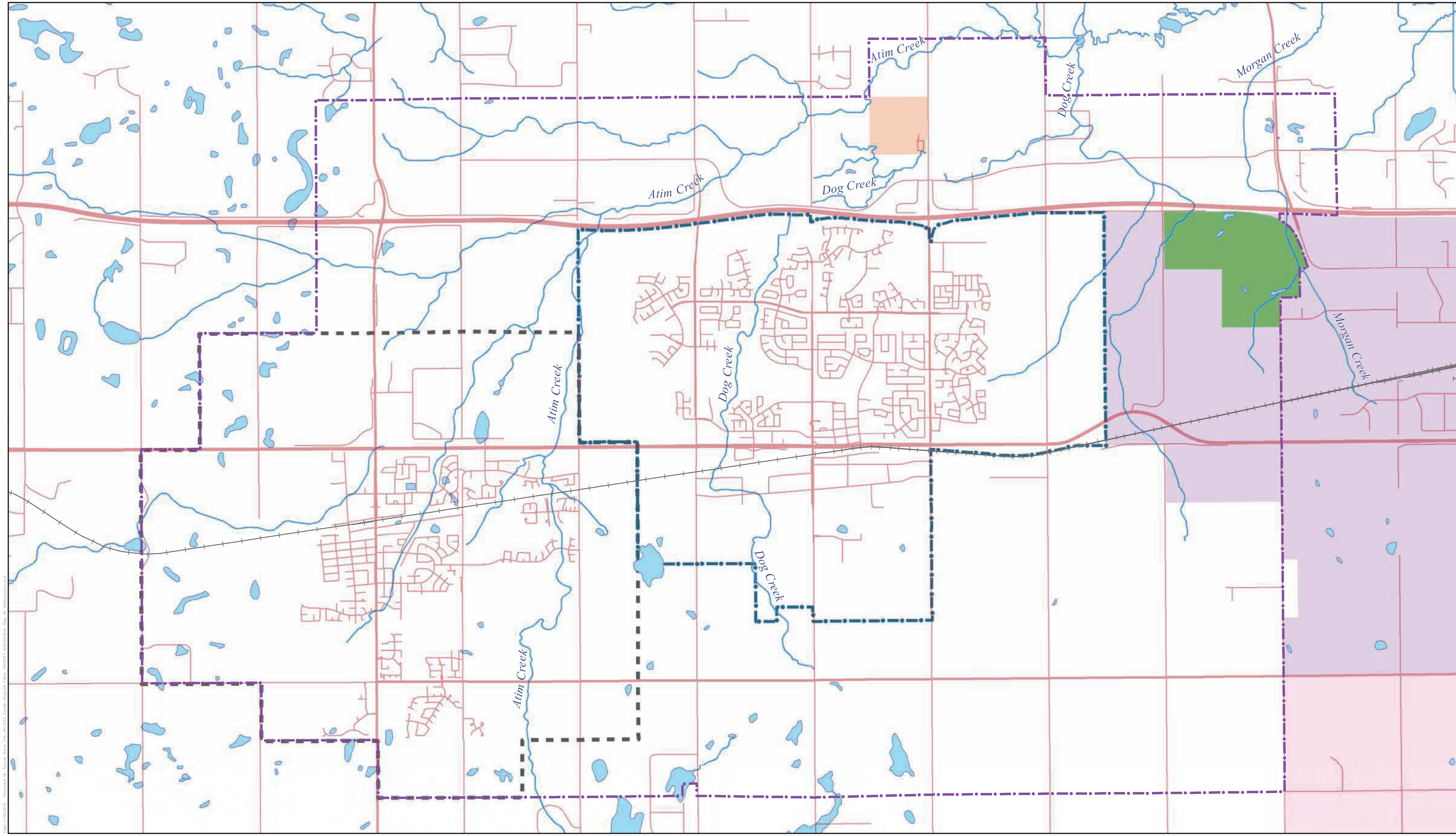
- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial Area Structure Plan
- Enoch Cree Nation
- Parkland Village
- Wagner Natural Area
- Rail Line
- Regional Road
- Other Road
- Watercourse
- Water Body
- 5 m Contour
- 1 m Contour

N

1:50,000

The City of SPRUCE GROVE

GROWTH STUDY • MAP 5
TOPOGRAPHY



Study Area
City of Spruce Grove
Town of Stony Plain
Acheson Industrial Area Structure Plan
Enoch Cree Nation
Parkland Village
Wagner Natural Area
Rail Line
Regional Road
Other Road
Watercourse
Water Body

ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

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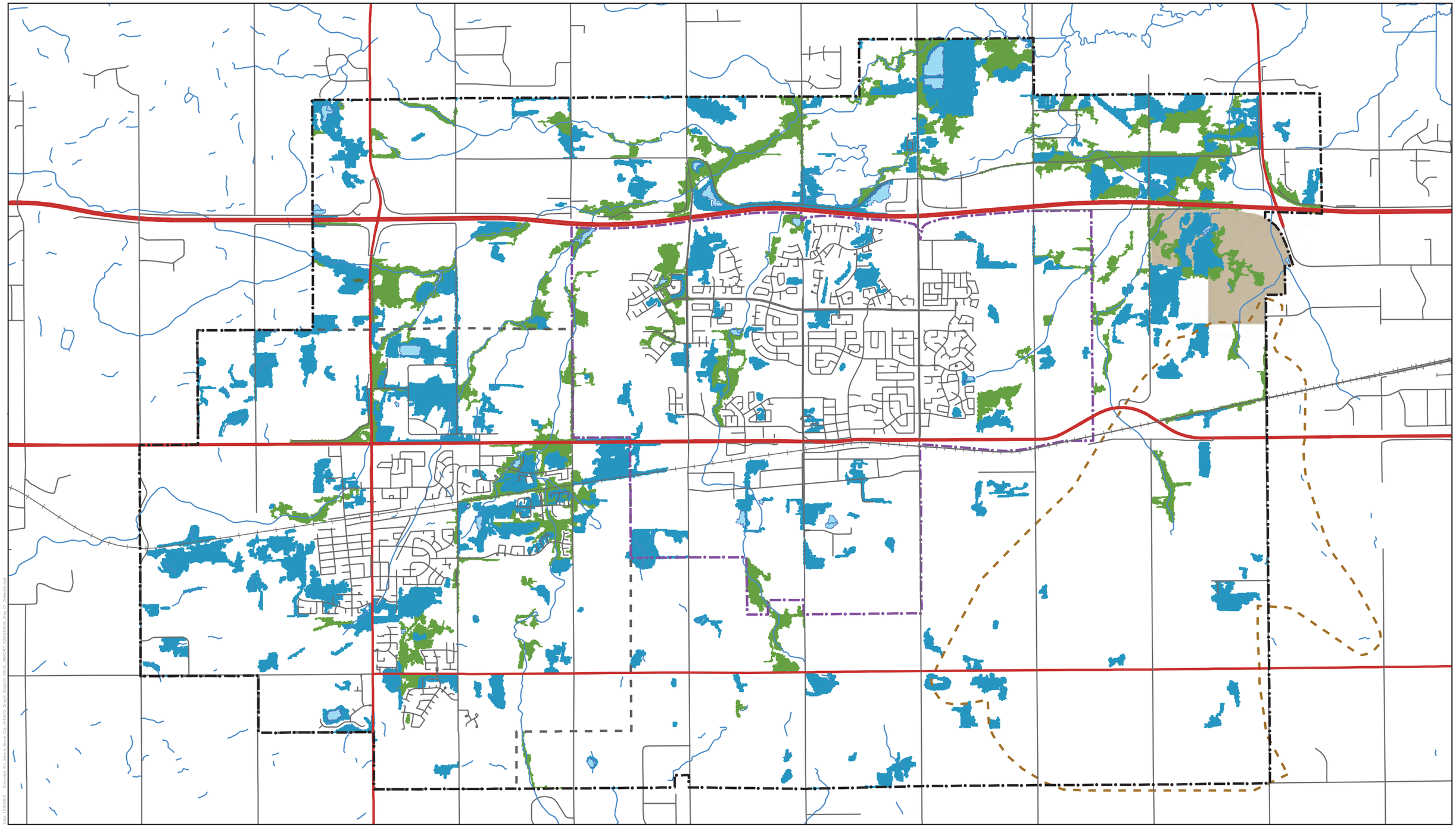
The City of Spruce Grove

GROWTH STUDY • MAP 6
WATERCOURSES



ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Wagner Natural Area (WNA)
- Swamp †
- Fen †
- Marsh †
- Open Water †
- WNA Recharge Zone (approximate)
- Watercourse

† Source: Alberta Merged Wetland Inventory (AMWI) published by Alberta Environment and Parks (AEP)

Disclaimer: Note that the AMWI was stitched together from multiple sources by AEP. As such, the methodologies and levels of detail may vary from source to source. The wetlands from the AMWI should therefore only be considered a high level overview of potential wetlands within the study area. Refer to Appendix A for a recent desktop overview of wetlands present within the study area.

N

1:50,000

The City of Spruce Grove

GROWTH STUDY • MAP 7
WETLANDS

the regional groundwater aquifer that is recharged by infiltration to the lands to the south of the Wagner Natural Area."[25]

A recharge zone for the Wagner Natural Area is illustrated on Map 7. It is located south of the Wagner Natural Area and the vast majority of it is privately owned. It includes much of the southeast portion of the study area.

The Acheson Industrial ASP indicates that installation of water and sewer servicing should be undertaken with care to not disrupt the ability for surface water and groundwater to recharge the Wagner Natural Area. Future development must not compromise the current surface water and groundwater conditions. The ASP outlines a number of policies to avoid damage to the recharge zone and to mitigate adverse impacts.

5.4 Soils

Map 8 illustrates the soil capability for agriculture from the Canadian Land Inventory (CLI) for the City of Spruce Grove, Town of Stony Plain and the balance of the study area. The types of soils present include Classes 1 through 6 and Class O. Table 16 provides definitions and descriptions of each soil class from Agriculture and Agri-Food Canada where available.

Table 16: Land Capability Classes for Agriculture

Class	Definition	Description
1	No significant limitations	Soils in this class have no significant limitations in use for crops.
2	Moderate limitations; moderate conservation practices required	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices.
3	Moderately severe limitations; range of crops restricted or special conservation practices required	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices.
4	Severe limitations	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices.
5	Forage crops – improvement practices feasible	Soils in this class gave very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible.
6	Forage crops – improvement practices are not feasible	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible.
7	No capability for arable culture or permanent pasture	Soils in this class have no capacity for arable culture or permanent pasture.
8	Unclassified areas	Unclassified
O	Organic soils	Organic Soils (not placed in capability classes).
W	Water	

Source: ISO 19131 Canadian Land Inventory (CLI) – Data Product Specification and Overview Of Classification Methodology for Determining Land Capability For Agriculture

As illustrated in Map 8, the highest rated (Class 1) soil present is primarily located in the northeast and southeast portions of the study area, as well as much of the City of Spruce Grove proper. Class 1 soils are also present in the south and central areas of the Town of Stony Plain. Class 2 and 3 soils are present in much of the balance of the lands north of Highway 16 and south of Spruce Grove. Class O soils

[25] Source: Parkland County's Acheson Industrial Area Structure Plan.

predominate in the northeast corner of the study area and in two pockets in Stony Plain, where a strip of Class 6 soil is also present.

Table 17 presents a summary of the soil types within the study area by municipality, while observations arising out of the table are provided below.

Table 17: Land Capability Classes for Agriculture Breakdown

CLI Class	Spruce Grove		Stony Plain		Parkland County		Total	
	Ha	%	Ha	%	Ha	%	Ha	%
1	2,653.9	83.9	1,128.3	30.6	3,441.8	45.3	7,223.9	50.0
2	175.5	5.6	1,276.3	34.6	2,244.9	29.5	3,696.7	25.6
3	332.1	10.5	695.2	18.9	1,354.7	17.8	2,381.9	16.5
4	-	-	4.1	0.1	78.1	1.0	82.2	0.6
5	-	-	-	-	0.2	0.0	0.2	0.0
6	-	-	156.2	4.2	-	-	156.2	1.1
0	-	-	425.8	11.6	485.6	6.4	911.4	6.3
Total	**3,161.4**	**100.0**	**3,685.9**	**100.0**	**7,605.3**	**100.0**	**14,452.6**	**100.0**

The following are key observations from Map 8 and Table 17.

- Of the total study area, 50.0% is Class 1 and 25.6% is Class 2, while 24.4% lower class soils (Classes 3, 4, 5, 6 and O).
- Of the Class 1 soils in the study area, 48% or 3,442 ha are located within Parkland County while 37% or 2,654 ha are located within the City of Spruce Grove.
- Of the 3,532 ha of lower class soils in the study area, 54% or 1,919 ha are located in the Parkland County portion of the study area.

5.5 Municipal Servicing Considerations

Both the Capital Region Parkland Water Service Commission (CRPWSC) and the Alberta Capital Region Wastewater Commission (ACRWC) have existing regional lines that provide servicing to Spruce Grove, Stony Plain and portions of Parkland County within the study area. The locations of these existing regional lines within the study area are illustrated on Map 9. Upgrades to the regional infrastructure may be required to accommodate growth regardless of the location of development unless alternative connections to the regional system are made.

The regional water lines fill the Zone 1 and Zone 2 Reservoirs located within the City, and the Meridian and High Park Reservoirs located within the Town. There are no reservoirs in the County portion of the study area, but Parkland County is planning a reservoir immediately north of Highway 16A along the east edge of the study area. The City's water distribution system is supplied through two pressure zones that operate from the Zone 1 and 2 Reservoirs. In Stony Plain, the Town's water distribution system is supplied through the two existing reservoirs. In the rural portion of the study area, the only water distribution system is the Parkland Village trickle feed line supplied through the Spruce Grove water distribution system.

The City's wastewater collection system consists solely of gravity systems which discharge to the ACRWC Parkland Trunk traversing through the northwest corner of the City and the northeast portion of the study

Study Area
City of Spruce Grove
Town of Stony Plain
Rail Line

Regional Road
Other Road
Watercourse
Water Body

CLI Class 1
CLI Class 2
CLI Class 3
CLI Class 4

CLI Class 5
CLI Class 6
CLI Class O

ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

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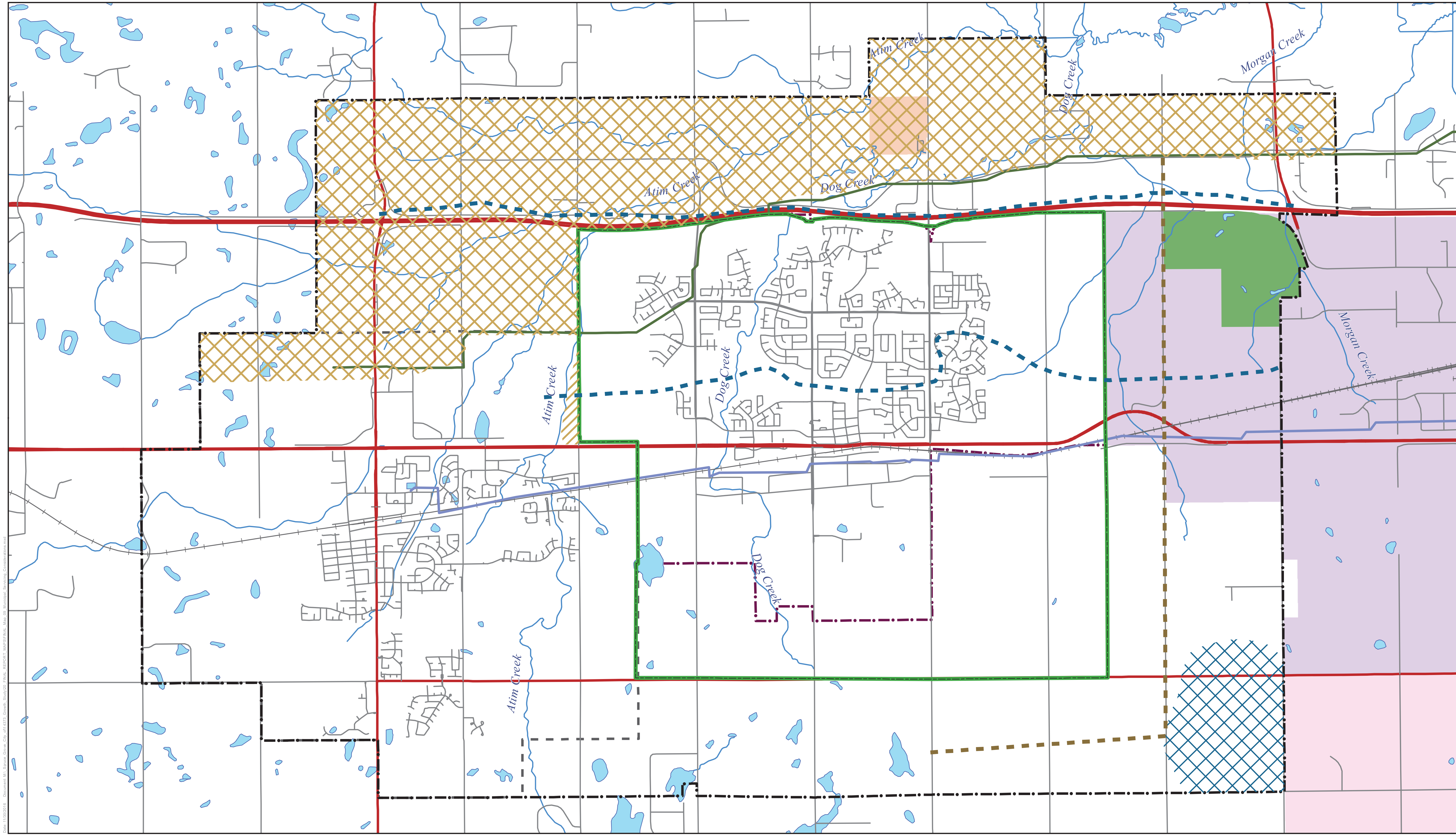
The City of SPRUCE GROVE

GROWTH STUDY • MAP 8
AGRICULTURAL SOILS



ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Rail Line
- Regional Road
- Other Road
- Watercourse
- Water Body
- CRPWSC (conceptual)
- ACRWC (conceptual)
- Water Pressure Zone Boundary
- Sanitary Master Plan Boundary
- Trunk to Service Beyond Sanitary Master Plan
- Sanitary Not Serviceable by Gravity
- Serviceable by Gravity to Spruce Grove System
- Potential Stormwater Service by Pumping

N

1:50,000

The City of Spruce Grove

GROWTH STUDY • MAP 9
MUNICIPAL SERVICING CONSIDERATIONS

area. In Stony Plain, the Town's wastewater collection system consists of gravity sewers connecting to the ACRWC Parkland Trunk. In the rural portion of the study area, Parkland County's wastewater collection system consists of a few gravity connections to the ACRWC Trunk plus a small pump station servicing Parkland Village to the ACRWC Trunk.

Existing streams and watercourses to accommodate stormwater discharge were also identified within the study area. These include:

- Atim Creek running south to north through Stony Plain, through the extreme northwest corner of Spruce Grove, and then running west to east through the north portion of the study area, eventually draining into Big Lake;
- Dog Creek running south to north through Spruce Grove, and then west to east through the north part of the study area, discharging into Atim Creek; and
- Two unnamed watercourses running south to north through the east part of the study area, discharging to Atim Creek.

A desktop analysis utilizing 1 m contours was undertaken to determine an approximate gravity utility servicing area for wastewater and stormwater purposes. Wastewater discharge to the existing City system was assumed when determining the serviceability of the lands, while adjacent watercourses were assumed for stormwater servicing discharge.

Wastewater servicing for the entire study area to the ACRWC Parkland Trunk is feasible, and the lands within the City and Town can be serviced by gravity. The lands north of the City and Town would need to be serviced by a pump station, although it may be possible to service the lands north of Highway 16 and south of the ACRWC Trunk by gravity. The lands within the eastern 2.4 km (1.5 mi) of the study area (south of Highway 16), and within the south edge of the study area (south of Highway 628 excluding Stony Plain) will require a new trunk as these areas were not planned for in the City's most recent Sanitary Master Plan.

While there is available grade to service the south area by gravity, it will be difficult to implement due to the variation in topography east to west. Sections of this trunk would need to be in excess of 10 m (33 ft) deep, and thus would be more costly to construct. It may be more cost effective to service some of the lands south of Highway 628 by pump station.

Stormwater servicing is possible for all of the lands in the study area. Most of the study area can be serviced by gravity to the various northward flowing creeks draining to Atim Creek and Big Lake. The far southeast part of the study area is lower than the surrounding lands and will be more difficult to service, and thus a stormwater pump station may be necessary. As the southeast part of the study area is part of the Wagner Natural Area's recharge zone, special considerations will be needed for stormwater servicing to promote groundwater infiltration. Also, some of the low areas adjacent to the creeks may have some stormwater drainage design challenges where the ground slopes are gradual. There is therefore little vertical relief available for a stormwater facility discharging by gravity to the watercourses. Outlet pipes from stormwater management facilities may need to be extended downstream at minimum slopes to a lower elevation point on the water course for discharge.

Water servicing to the entire study area is feasible via the Capital Region Parkland Water Services Commission system. The existing reservoirs (including newly expanded Zone 2 Reservoir) will be able to service the existing boundaries of the City and Town, and additional reservoirs may be needed to service the north, east and south parts of the study area. The existing pressure zones are suitable for servicing the lands south of Highway 16, while a new pressure zone would be needed to service new developments north of the highway.

5.6 Transportation Considerations

5.6.1 Regional Roads

As illustrated on Map 10, seven regional roadways as defined by the CRB's Integrated Regional Transportation Master Plan (IRTMP), including five highways and two municipal roads, are present within the study area.

Highway 16

Highway 16 (Yellowhead Highway) is the most significant of these roadways. It is classified as a Freeway in the IRTMP and serves as one of the two major commuter corridors between Stony Plain/Spruce Grove and employment areas in eastern Parkland County (Acheson), western Edmonton and beyond. As part of Canada's National Highway System, Highway 16 also serves as the primary highway connector from the Capital Region to northwest Alberta, northeast British Columbia, the Northwest Territories and Alaska. As a four-lane divided highway, it travels in an east-west direction through the northern portion of the study area, bypassing both Stony Plain and Spruce Grove.

Four interchanges are in service along Highway 16 within the study area. They are located at:

- Highway 779, providing access to Stony Plain in the west;
- Jennifer Heil Way (Range Road 274) providing access to west Spruce Grove,
- Century Road (Range Road 272), providing access to east Spruce Grove; and
- Highway 44, providing access to Acheson in the east.

Only one at-grade intersection remains along the highway within the study area. This intersection is at Atim Road (Range Road 270), which is 3.2 km (2.0 mi) east of Century Road and 1.6 km (1.0 mi) west of Highway 44.

Highway 16A

Highway 16A (Parkland Highway) is the original alignment of Highway 16. It is classified as an Expressway in the IRTMP as it enters the study area from the west and transitions to an Arterial from Glory Hills Road (Range Road 11) in western Stony Plain to Township Road 530 just east of the grade separation over the Canadian National main line. At this intersection, Highway 16A transitions back to an Expressway in the IRTMP through Acheson into the City of Edmonton. Varying as a four-lane and six-lane divided highway, it bisects the central portion of the study area in parallel to Highway 16, and serves as the other major commuter corridor between Stony Plain/Spruce Grove and Acheson/Edmonton. From west to east, Highway 16A travels through northern Stony Plain and the central portions of Spruce Grove and Acheson into the City of Edmonton where it continues as Stony Plain Road.

All intersections along Highway 16A are at-grade with the exception of one interchange at Highway 779 (48 Street) in Stony Plain. The spacing of at-grade intersections is generally 1.6 km (1.0 mi) in the study area west of Jennifer Heil Way/Campsite Road and east of Pioneer Road (Range Road 271). Between these two intersections within Spruce Grove, signalized four-legged at-grade intersections occur approximately every 0.8 km (0.5 mi) with additional restricted accesses permitted within smaller distances. Parkland County desires an interchange at Spruce Valley Road (Range Road 265), though it is not currently recognized as a future interchange location by Alberta Transportation (AT).

Highway 628

Highway 628 is the third east-west highway that bisects the study area. Paralleling Highway 16A, it originates at Highway 779 (48 Street) in Stony Plain and is paved for 7.7 km (4.8 mi) to Century Road (Range Road 272) south of Spruce Grove. East of this intersection, Highway 628 is a gravel road to Highway 60. East of the study area, Highway 628 provides access to the Enoch Cree Nation on the south

side of the highway, and transitions into Whitemud Drive as it enters the City of Edmonton. For its entire stretch within the study area, Highway 628 is classified as an Expressway in the IRTMP.

AT has completed a functional planning study update for Highway 628 from east of Highway 779 to Highway 60 in 2006. It identified a number of upgrades including future widening, realignment, access removal/consolidation and twinning to a four-lane divided standard. The realignment avoids a number of small developed parcels on the north side of the current highway alignment by bypassing these parcels to the north. The realignment will begin east of Campsite Road (Range Road 274) and end at Pioneer Road (Range Road 271). The future upgrades also involve tying into a planned interchange at Highway 60, while all intersections between Highway 779 and 60 are planned to be at-grade with 1.6 km (1.0 mi) spacing east of Golf Course Road (Range Road 280).

North-South Corridors

The following three major north-south corridors bisect the study area:

- Highway 779/48 Street (Meridian Road) through Stony Plain and the Fifth Meridian ASP;
- Range Road 274, which is known as Jennifer Heil Way/Campsite Road within Spruce Grove; and
- Range Road 272, which is known as Century Road within Spruce Grove.

Between Highway 628 and Highway 16, all of these corridors are classified as Arterials in the IRTMP. Highway 779 is classified as an Expressway south of Highway 628 and north of Highway 16.

Highway 44 is another north-south corridor within the study area. It extends north from Highway 16 in the northeast corner of the study area providing a connection north to Villeneuve, Sturgeon County and Westlock. It is also classified as an Expressway in the IRTMP.

Future Intersection Spacing

Table 18 presents the preliminary future intersection spacing for regional roadways within the study area according to the IRTMP.

Table 18: Preliminary Future Intersection Spacing of Regional Roadways

Major Roadway	Road Authority (as of 2016)	IRTMP Classification	IRTMP Minimum Access Spacing Guideline
Highway 16 throughout study area	AT	Freeway	1,600 to 3,200 m (grade separation)
Highway 16A west of Glory Hills Road	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 16A from Glory Hills Road to Jennifer Heil Way/Campsite Road	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 16A from Jennifer Heil Way/Campsite Road to Pioneer Road	City	Arterial	250 to 400 m (at-grade)
Highway 16A from Pioneer Road to Township Road 530	AT	Arterial	250 to 400 m (at-grade)
Highway 16A from Township Road 530 to Range Road 265	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 44 north of Highway 16	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 628 from Highway 779 to Golf Course Road	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 628 from Golf Course Road to Range Road 265	AT	Expressway	800 to 1,600 m (at-grade or grade separation)

Major Roadway	Road Authority (as of 2016)	IRTMP Classification	IRTMP Minimum Access Spacing Guideline
Highway 779 south of Highway 628	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Highway 779 from Highway 628 to Highway 16	AT	Arterial	250 to 400 m (at-grade)
Highway 779 north of Highway 16	AT	Expressway	800 to 1,600 m (at-grade or grade separation)
Jennifer Heil Way/Campsite Road (Range Road 274)	City/County	Arterial	250 to 400 m (at-grade)
Century Road (Range Road 272)	City/County	Arterial	250 to 400 m (at-grade)

It is recognized that the minimum access spacing guidelines differ between the IRTMP and AT. However, the IRTMP was approved as part of the CRGP by the Province and therefore has standing with AT.

City Boundary Roadways and Intersections

As illustrated on Map 10, three roadways running along the Spruce Grove's current boundaries afford access opportunities for future growth areas beyond the City limits. The first is coincidentally named Boundary Road (Range Road 275), which runs along Spruce Grove's west boundary for 1.6 km (1.0 mi) north of Highway 16A. The Town of Stony Plain is located on the west side of Boundary Road in this location.

The second and third boundary roadways are adjacent to Parkland County. The second is Century Road, which runs along the City's southeast boundary for nearly 2.4 km (1.5 mi) south of Highway 16A. The third is a short segment of Calahoo Road (Range Road 273) at the south end of the City that is 200 m (660 ft) in length.

The Shiloh ASP and the East Campsite Business Park ASP propose the construction of a fourth boundary roadway running east-west for about 1.2 km (0.75 mi) along the City's southwest boundary. Parkland County is located beyond this future boundary roadway to the south.

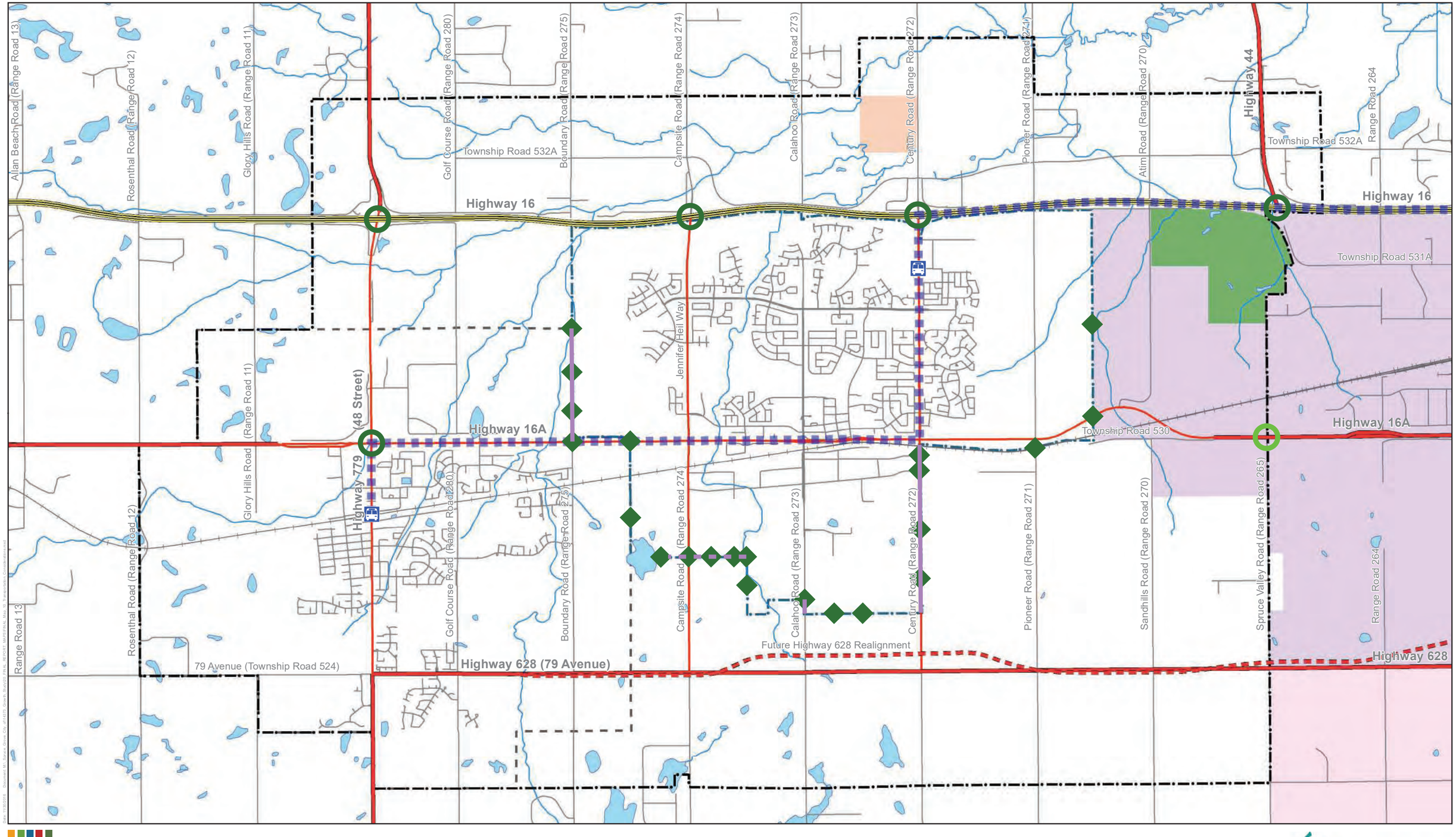
In addition, Spruce Grove's numerous ASPs identify 22 locations as illustrated on Map 10 as either future intersections with the existing boundary roadways, or as future transportation connections that could provide access to lands beyond the City's western, southern and eastern limits. Only two access points are available to Highway 16 along the City's northern limits – the existing interchanges at Jennifer Heil Way (Range Road 274) and Century Road (Range Road 272).

Overdimensional Corridors

Long Combination Vehicle Routes (LCVRs) and High Load Corridors (HLCs) are roadways designated by AT to accommodate overdimensional truck traffic. LCVRs accommodate truck traffic that is overdimensional in terms of length, while HLCs accommodate truck traffic that is overdimensional in terms of height. Highways 16, 16A and 44 are all designated as LCVRs by AT within the study area. There are no HLCs within the study area. However, the IRTMP identifies Highway 16 east of Highway 44, and Highway 44 north of Highway 16, as part of a potential future HLC from Nisku to the northern side of the Capital Region via Devon and Acheson.

5.6.2 Transit

From a transit perspective, the IRTMP also identifies a conceptual Transit Priority Corridor/Regional Bus alignment within the study area. This route concept, which is subject to detailed planning in the future, originates in downtown Stony Plain and travels:



ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Rail Line
- Freeway
- Expressway
- Arterial
- Other Road
- Future Realigned Expressway
- Existing City Boundary Road
- Future City Boundary Road
- Transit Priority Corridor/Regional Bus †
- Regional Park and Ride †
- City Boundary Intersection
- Existing Interchange
- Planned/Proposed Interchange

† **Source:** Capital Region Integrated Regional Transportation Master Plan (actual alignments and locations are conceptual and subject to further engineering and technical review)

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The City of SPRUCE GROVE

GROWTH STUDY • MAP 10
TRANSPORTATION CONSIDERATIONS

- North along Highway 779/48 Street;
- Then east along Highway 16A to Spruce Grove;
- Then north along Century Road within Spruce Grove; and
- Then east along Highway 16 to Edmonton.

Regional Park and Ride facilities are conceptually identified in both Stony Plain (along Highway 779/48 Street) and Spruce Grove (along Century Road).

At present, Spruce Grove delivers a one-route municipal transit service during peak hours within the community. This service continues as an express commuter service to/from Edmonton starting/ending at the intersection of Century Road and Grove Drive in the northeast portion of the City. Every second bus in this express commuter service makes a stop in Acheson between Spruce Grove and Edmonton in each peak flow direction.

5.6.3 Rail

A Canadian National (CN) main line bisects the study area travelling east-west in an alignment generally south of and parallel to Highway 16A. It experiences a volume of approximately 35 trains per day. CN typically discourages the construction of new rail crossings. At an average of 35 trains per day, a grade separation warrant of an existing crossing is met at 5,700 vehicles per day on the crossing road.

5.6.4 Transportation Considerations

The following is a brief summary of specific additional transportation considerations for the study area.

- Highway 16 is a significant traffic corridor and currently forms the north boundary of Spruce Grove. Although interchange locations are well-established and not subject to change, the logistics of facilitating future growth across Highway 16 will require review with AT. AT may not be supportive of constructing any further interchanges in this area. Further, any future growth scenario that moves Spruce Grove's current limits north of Highway 16 may trigger the title and responsibility of Highway 16 being transferred from AT to the City of Spruce Grove. In turn, this could trigger financial responsibilities being assigned to the City for ongoing maintenance and upgrading of the highway and its interchanges.
- The expansion of Spruce Grove to the southeast will involve the crossing of Highway 16A and the CN main line, which currently serves as the city boundary at this location. There is an existing intersection and rail crossing at Pioneer Road (Range Road 271) that provides access to the southeast area from the City. It is assumed that this road would continue to provide access, presumably as a future arterial roadway. As mentioned above, a grade separation of Pioneer Road from the CN main line may be warranted once traffic volumes at the crossing exceed 5,700 vehicles per day.
- The implications of crossing Highway 628 will require examination to determine if it creates an impediment to southerly expansion of Spruce Grove. Initial review suggests that the crossing of Highway 628 would not be an issue as urban development is currently located on both sides of this roadway within the Town of Stony Plain. However, this does requires confirmation, especially as the IRTMP identifies Highway 628 as an Expressway rather than an Arterial. Also, like crossing Highway 16 to the north, any future growth scenario that moves Spruce Grove's current limits south of Highway 628 may trigger the title and responsibility of Highway 628 being transferred from AT to the City of Spruce Grove. In turn, this could trigger financial responsibilities being assigned to the City for ongoing maintenance and upgrading of the highway. This could include the costs to widen, realign, and twinning Highway 628 to a four-lane divided standard if not previously undertaken by AT.
- As the Town of Stony Plain does not yet hold city status, AT continues to have title and responsibility over the provincial highways running through its municipal boundaries. A potential amalgamation growth scenario involving the City and the Town may result in the title and responsibility for highways within Stony Plain being transferred from AT to the amalgamated city. Similarly, a specialized municipality growth scenario that results in Spruce Grove and Stony Plain becoming urban service areas may also

result in the title and responsibility for highways within Stony Plain being transferred from AT to the specialized city.

5.7 Land Use Considerations

5.7.1 Capital Region Growth Plan

The Capital Region Board (CRB) approved the Capital Region Growth Plan (CRGP) and two of its addenda in 2009, which were subsequently approved by the Province of Alberta in 2010. The CRGP delineates the conceptual boundaries of priority growth areas (PGAs) and cluster country residential areas (CCRAs) within the Capital Region where growth should be directed. The CRGP also applies density targets to PGAs and CCRAs.

As illustrated in Map 11, the City of Spruce Grove is located within PGA 'A', which has an assigned density target range of 25 to 30 dwelling units per net residential hectare (du/nrha). In addition to Spruce Grove and Stony Plain, PGA 'A' conceptually includes lands to the south and east of the current Spruce Grove city limits, and includes the Acheson area of Parkland County. No lands north of Highway 16 are located within the conceptual boundaries of PGA 'A'.

That portion of the study area located north of Highway 16 is contained within CCRA "I" of the CRGP, in which a density target of 2.0 dwelling units per gross residential hectare (du/grha) has been established. The purpose of the CCRAs is to promote serviced country residential development that emphasizes the preservation of environmental and open space features. Urban expansion is not consistent with the intent of CCRAs.

The CRB is currently updating the CRGP. The boundaries of PGAs and CCRAs are therefore under review and the successor PGA 'A' and CCRA "I" or equivalent policy areas may differ once the updated CRGP is approved.

5.7.2 Acheson Industrial Area

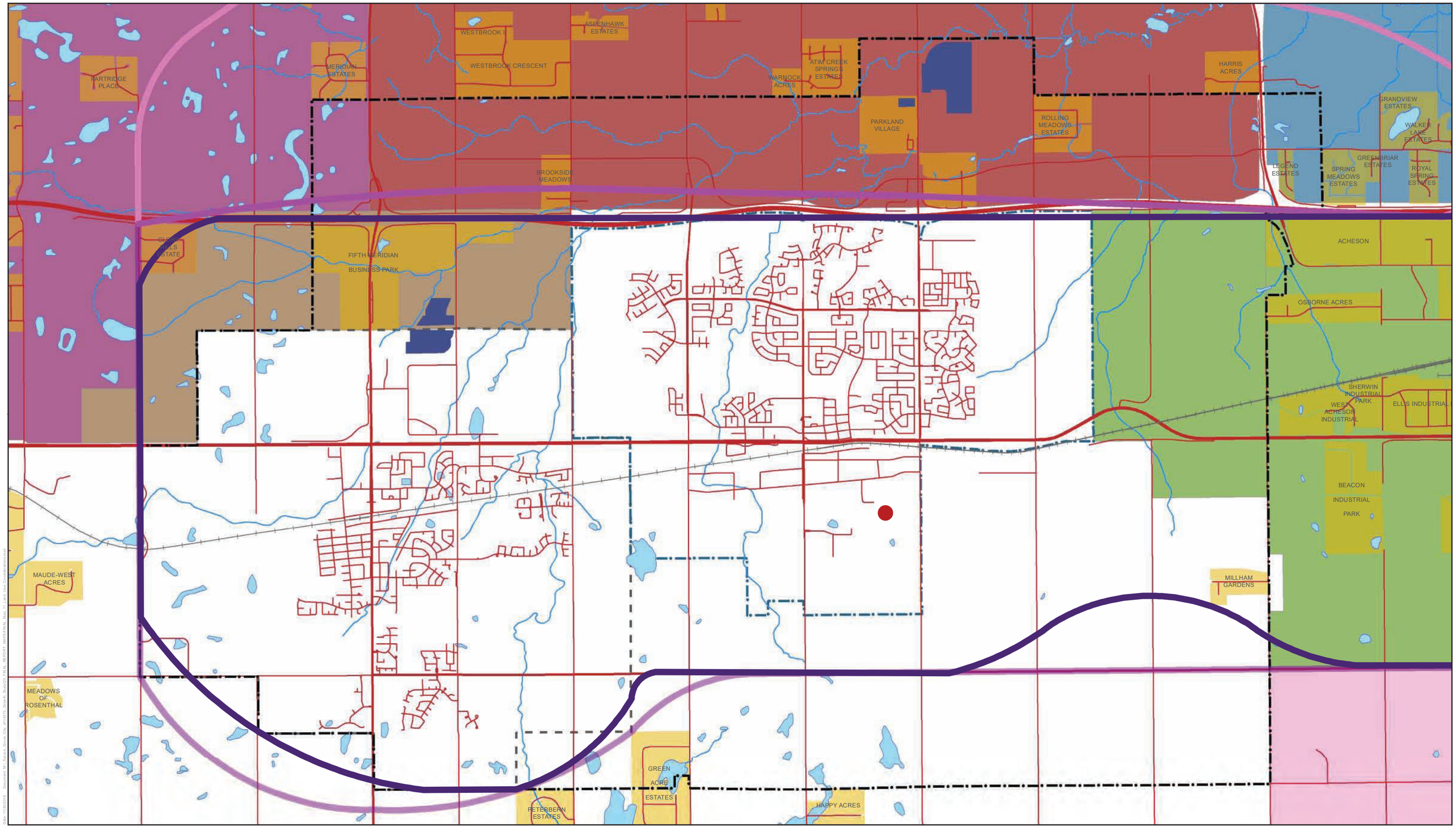
The core of the Acheson Industrial Area is located just beyond the study area to the east. The Acheson Industrial Area has been developing for a number of decades. It had its own business association form in 2004.

Although the core of the Acheson Industrial Area is outside the study area. Parkland County adopted a new Acheson Industrial ASP in December 2014. The ASP includes 3.5 sections of land in the east end of the study area, including the Wagner Natural Area. The majority of the subject land, located north of the CN Rail line and south/west of the Wagner Natural Area, is identified as "Agriculture Area A" in which the Parkland County will "undertake future joint planning initiatives with the City of Spruce Grove to explore future acceptable land uses".

The balance of the affected area located south of the CN Rail line is identified a "Business Industrial", in which serviced light industrial development is proposed on high visibility sites with higher quality building, landscaping and site design standards being employed.

5.7.3 Parkland County Area Structure Plans

In addition to the Acheson Industrial ASP mentioned above, the study area overlaps portions of four other ASPs adopted by Parkland County. The locations of all five ASPs are illustrated of Map 11.



ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Enoch Cree Nation
- Existing Development
- Lagoon Facility
- Priority Growth Area
- Cluster Country Residential Area
- Metropolitan Area
- Former Landfill
- Acheson Industrial ASP
- Atim Creek ASP
- Big Lake ASP
- Fifth Meridian ASP
- Glory Hills ASP

N

1:50,000

The City of Spruce Grove

GROWTH STUDY • MAP 11
LAND USE CONSIDERATIONS

Big Lake ASP

In the far northeast corner of the study area, the Big Lake ASP applies to the two quarter sections to the northeast of the intersection of Highways 16 and 44. The ASP, originally adopted 1991 but amended on a number of occasion, designates these two quarter sections for country residential development and recreational uses.

Atim Creek North ASP

The Atim Creek North ASP is in effect on the north side of Highway 16 between Highway 44 in the east and Highway 779 in the west. Adopted in 2002, it designates the first two quarter sections on the north side of Highway 16, west of Highway 44, for future highway commercial development. Opposite the City of Spruce Grove, the ASP designates a strip of ten quarter sections along the north side of Highway 16 as a fringe area of mutual intermunicipal interest to both Parkland County and the City. These lands are intended to remain under agricultural use.

Beyond the fringe area and future highway commercial land uses, all other lands within the study area portion of the ASP are designated for country residential development, other than the recognition of the existing of the Parkland Village manufactured home community and the 1:100 year floodplain area of Atim Creek.

Glory Hills ASP

The Glory Hills ASP applies to the two quarter sections in the far northwest corner of the study area north of Highway 16 and west of Highway 779. Adopted in 1979 and amended in 2002, the ASP designates its lands to accommodate country residential and recreational uses.

Fifth Meridian ASP

The Fifth Meridian ASP applies to lands in the northwest portion of the study area that are north of the Town of Stony Plain, south of Highway 16, and west of the City of Spruce Grove, including the two quarter sections west of Highway 779. Within the four easternmost quarter sections adjacent to Spruce Grove, the ASP designates lands for a mix of future estate residential, country residential and open space land uses. Elsewhere to the west, lands are designated for a mix of business industrial, public services, open space, and parks and recreation, while some lands to the west of Highway 779 are designated for future country residential.

5.7.4 Existing Development

As illustrated of Map 11, the largest concentrations of existing developments are located in the north end of the study area. This includes the Fifth Meridian Business Park on Highway 779 between the Town of Stony Plain to the south and Highway 16 to the north. It also includes the Parkland Village manufactured home community and several country residential subdivisions including Brookside Meadows, Rolling Meadows Estates, Legends Estates and an unnamed subdivision at the northeast corner of Highway 16 and Century Road (Range Road 272).

Larger existing development in the southerly portion of the study area is generally limited to include Green Acre Estates adjacent to the south boundary of the study area, and Millham Gardens located on the east boundary of the study area.

Other developments that will have implications for future urban development include existing and former sewage lagoon facilities adjacent to Parkland Village and at the north end of Stony Plain, as well as a former landfill in the southeast portion of Spruce Grove, at least 300 m (984 ft.) west of Century Road (Range Road 272). Legislated development setbacks limit the opportunities for residential development in proximity to these facilities.

The balance of the study area is predominantly under agricultural production with numerous farmsteads and small pockets of areas remaining in a natural state.

5.7.5 Ownership and Land Fragmentation

Map 12 illustrates the status of parcels by ownership type within the study area.

The vast majority of the lands in the study area are privately held. Crown Lands are limited to two quarter sections and a remnant portion of a quarter in the north portion of the study area, and the Wagner Natural Area in the northeast.

Municipally-owned lands are located sporadically throughout the study area, and generally consist of municipal reserve and environmental reserve parcels.

Map 12 also illustrates those parcels within the study areas that are fragmented due to past subdivision activity. Those parcels that are less than 4 ha (10 ac) in size, and those parcels between 4 ha (10 ac) and 10 ha (25 ac) are identified.

5.8 Energy Considerations

Map 13 illustrates the various energy considerations within the study area. The CRB's Regional Energy Corridors Master Plan (RECMP) was approved in February 2016 and establishes policies and criteria for accommodating regional pipeline and power transmission corridors within the Capital Region in a manner that is consistent and compatible with the principles and policies of the CRGP. The RECMP identifies the Trans Mountain pipeline as a Priority Pipeline Corridor.

One major pipeline corridor is located within the study area. The subject pipeline (Trans Mountain) conveys oil from Alberta's Industrial Heartland to the British Columbia coast. The pipeline enters the east end of the study area midway between Highways 16A and 628, traverses the south end of Spruce Grove, and then loops around the north end of Stony Plain before continuing to the west. It is identified as a regional pipeline corridor within the RECMP.

Two existing power transmission corridors that are identified within the RECMP are also present within the study area. Both generally travel east/west. The northern of the two traverses the northern portion of the study area, paralleling Highway 16. The southern traverses the southern portion of the study area along Highway 628 before zigzagging through east and northeast portions of Stony Plain. In addition, the RECMP identifies a conceptual future power corridor need that could impact the eastern portion of the study area once an alignment has been determined by the Alberta Electric System Operator.

A number of active and abandoned wells are present within the study area as well as a number of pipelines. The greatest concentration of wells and pipelines is within the southeast portion of the study area. This concentration includes about a dozen active wells that are either flowing, pumping or suspended. Beyond this cluster, there only appears to be two other active wells within the study area including one in the northeast corner of Stony Plain and one south of the City and north of Highway 628 between Century Road (Range Road 272) and Calahoo Road (Range Road 273).

A review of well data from Abadata indicates that there does not appear to be any sour gas wells within the study area. The Alberta Energy Regulator's directives indicate that setbacks from wells to sensitive land uses are 5 m from reclaimed wells and 100 m from wells that are active or not yet reclaimed. A review of pipeline data reveals there may be one sour gas pipeline southeast of the City on the quarter section line between Pioneer Road (Range Road 271) and Sandhills Road (Range Road 270). An inquiry has been placed with the operator, PennWest, to confirm its status as a sour gas pipeline and if there are any setback requirements from future development that extend beyond the pipeline's registered right-of-way.

Study Area
City of Spruce Grove
Town of Stony Plain

< 4 ha Parcels
4 to 10 ha Parcels
> 10 ha Parcels

Crown Land
County Land

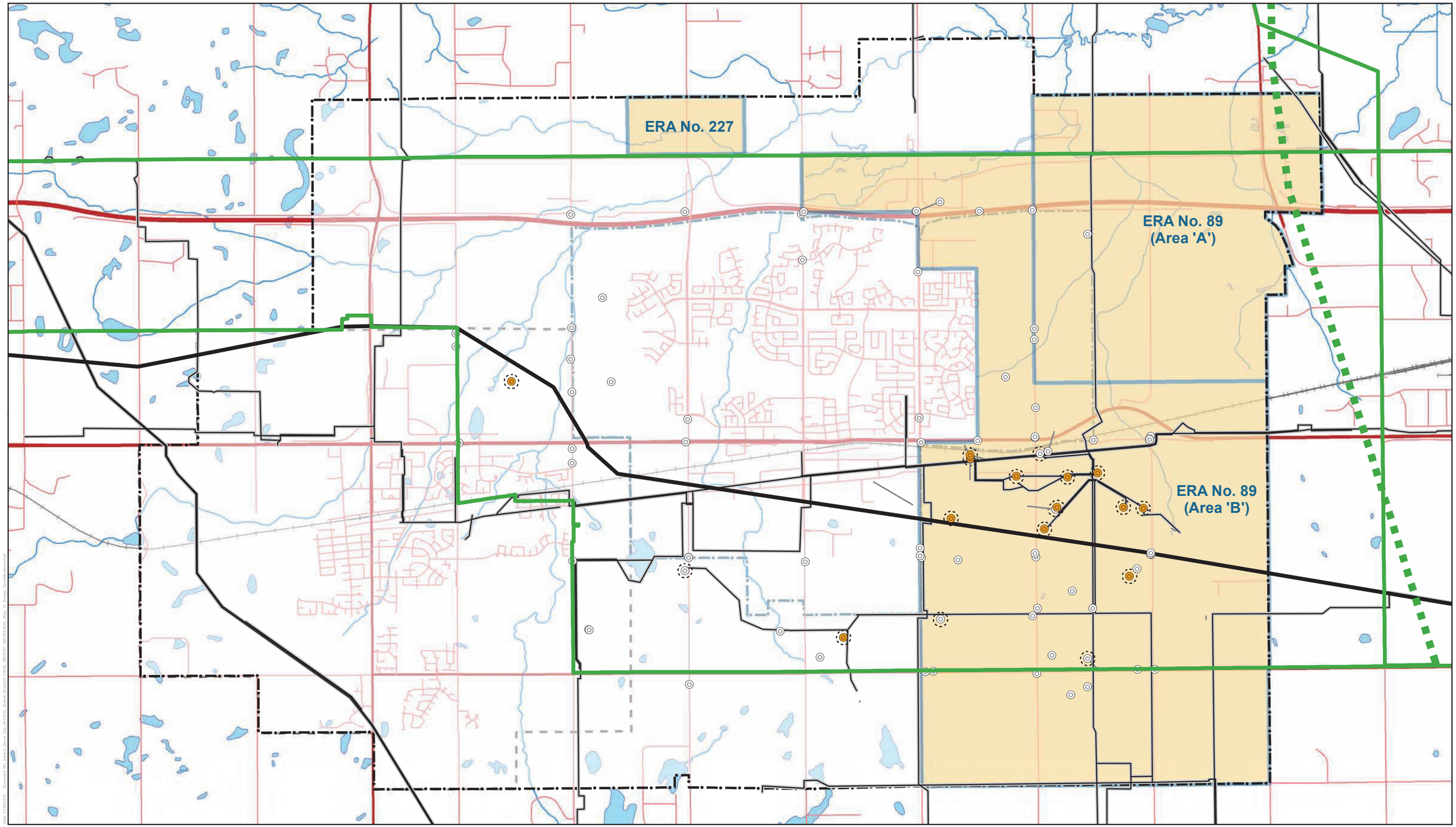
0 500 1,000 2,000 3,000 metres

1:50,000

ISL Engineering and Land Services

The City of Spruce Grove

GROWTH STUDY • MAP 12
OWNERSHIP AND FRAGMENTATION



ISL Engineering and Land Services

Study Area
City of Spruce Grove
Town of Stony Plain
Flowing, Pumping or Suspended Well
Abandoned Well
Directional Drill Line
Pipeline
Priority Pipeline Corridor
Assumed 15 m R/W
Exploration Restricted Area (ERA)
Existing Power Corridor
Planned Power Corridor (Conceptual)

0 500 1,000 2,000 3,000 metres

N

1:50,000

The City of SPRUCE GROVE

GROWTH STUDY • MAP 13
ENERGY CONSIDERATIONS

In addition to the above, the Government of Alberta has implemented seismic exploration restrictions in three locations within the study area. The first two locations fall within Exploration Restricted Area (ERA) No. 89. In Area 'A', both shot hole drilling and surface energy activity is not permitted. In Area 'B', shot hole drilling is not permitted, while surface energy activity is permitted. Both Areas 'A' and 'B' extended beyond the study area to the east. These restrictions were applied in 2001 for the purpose of protecting the Wagner Natural Area.

Northwest of Spruce Grove, four quarter sections fall within ERA No. 227, of which two extend beyond the study area boundary to the north. Applied in 2005, the intent of the restriction is to protect a flowing hole area and allow shot hole depths no deeper than 9 m.

6.0 Growth Assumptions

6.1 Residential Intensification Allowance

The City of Spruce Grove is one of the youngest urban municipalities in the Capital Region at 61 years since incorporation. Statistics Canada's 2011 National Household Survey reported that 55 or 0.6% of the City's 9,620 occupied private dwellings were constructed prior to 1961. As a result of the City's young history, Spruce Grove has relatively little housing stock and underutilized sites that have the potential to be redeveloped over time into residential land uses at higher than traditional densities. The only area within the City that has reasonable potential for residential redevelopment is its downtown core. There is limited potential for the redevelopment of the mature suburban residential areas surrounding the downtown core due to their subdivision design.

For the purpose of this Growth Study, it is assumed that 5% of the City's population growth will be accommodated through intensification activities such as infill and redevelopment. It should be noted however that redevelopment activities will displace existing lower intensity land uses. That is, a family renting an older house will be displaced elsewhere within the City in order for the landowner to redevelop the property with a semi-detached dwelling. Similarly, the businesses leasing space in an underutilized commercial building will be displaced elsewhere within the City in order for the landowner to redevelop the property with an apartment building.

6.2 Average Household Size

For the purpose of estimating the amount of lands required for future residential development, a combined average household size of 2.67 persons per occupied dwelling was assumed, which is down slightly from the City's average household size of 2.7 as recorded by the 2011 federal census. Average household size varies over time due to the demographic changes of a community. The assumption of 2.67 persons per occupied dwelling represents the average household size of the City in 2067 under the recommended Medium-High Case of the alternative population projection scenarios presented in Chapter 3.0.

6.3 Residential Density

The City of Spruce Grove is contained within Priority Growth Area (PGA) 'A' in the October 2009 Addendum to the *Capital Region Growth Plan* (*CRGP*). The conceptual boundaries of this PGA also include the Town of Stony Plain and portions of Parkland County eastward to Edmonton generally between Highways 16 and 628 and inclusive of the Acheson Industrial Area. In this PGA, a density target range of 25-30 dwelling units per net residential hectare (du/nrha) is assigned. The 25 du/nrha at the bottom of the density target range represents a minimum planned density target that is applied to new greenfield residential growth within the PGA. The 30 du/nrha represents the maximum planned density target allowed to accommodate new greenfield residential growth within the PGA.[26]

Prior to the completion of this study, the CRB approved the *Edmonton Metropolitan Region Growth Plan* (*EMRGP*) in October 2016, which is anticipated to be endorsed by the Province of Alberta in late 2017 after which the EMRGP will come into force. Within the EMRGP, Spruce Grove is assigned a minimum greenfield residential density target of 35 du/nrha. The target applies to greenfield residential lands that are not already subject to an approved plan. All urban residential ASPs approved prior to the provincial endorsement of the EMRGP will be grandfathered at their currently planned densities, which are typically lower than 35 du/nrha.

[26] The Capital Region Growth Plan October 2009 Addendum defines density target as "a minimum to maximum density target assigned to PGAs" (page 71).

All of the City of Spruce Grove's available residential land supply is subject to an adopted ASP. Of the eleven residential ASPs in effect within the City, four have achieved full residential built-out while seven are in varying stages of residential build-out. According to the City, the average planned density among its residential ASPs is 28.3 du/nrha.

For the purpose of this Growth Study, the average residential density applying to the City's remaining available residential land supply is assumed to be 28.3 du/nrha. For potential expansion areas beyond the City limits that are not already subject to an approved urban residential ASP, an average residential density assumption of 35 du/nrha has been applied. This represents a 24% increase in density over the average residential density of 28.3 du/nrha applied to the City's remaining available residential land supply.

6.4 Net Developable Overheads

Net developable overheads are land uses required to support or service residential, commercial, industrial, and public services development, including parks and open space (inclusive of municipal reserve), public utilities (stormwater management facilities, lift stations, etc.) and circulation (local roads, collector roads, lanes and walkways). The Municipal Government Act (MGA) allows for the maximum dedication of developable lands for these overheads to be 40% – comprising 10% municipal reserve and 30% public utilities and circulation.

For the purpose of this Growth Study, it is assumed that 37% of the City's gross developable land requirements for future residential, commercial, industrial, and public services growth will accommodate the necessary net developable overheads. This 37% deduction assumes 12% for parks and open space, 5% for public utilities and 20% for circulation. While the 12% assumption for parks and open space is greater than the 10% maximum for municipal reserve (MR) dedication stipulated by the MGA, the remaining 2% is a reflection of the current state of parks and open space in Spruce Grove. As presented in Table 13 within Chapter 4.0, 11.9% is the proportion of the City's gross developable lands previously absorbed for parks and open space purposes. It is assumed the City will continue to acquire the additional 2% through means other than dedication at the subdivision stage.

Similarly, the assumption of 5% for public utilities is also informed by the City's current proportion of developable overheads presented in Table 13. Of Spruce Grove's absorbed land supply in Table 13, 4.7% of the gross developed lands are absorbed for public utility purposes.

Table 13 also indicated that 24.2% of the City's gross developed lands were dedicated to circulation. This 24.2% is overstated due to the significant right-of-way width dedicated for Highway 16A that bisects the City, as well as presence of rural grid roads adjacent to some of the City's remaining available lands. The assumption of 20% for circulation is more appropriate as this figure is an approximate average of the circulation estimates contained in residential ASPs adopted within the Capital Region.

6.5 Market Allowance

When determining land requirements to accommodate projected residential, commercial and industrial growth, ultimately there will be lands within future growth areas in which development will not occur within the horizon of a forecast period. In recognition of this, it is appropriate to apply a market allowance as an overhead that:

- recognizes that some land within future growth areas will not develop within the horizon of the Growth Study (e.g., landowners either will not develop or sell to developers, whether they own full quarter sections or smaller parcels); and
- encourages fair market competition among developers that are participating in development.

For the purpose of this Growth Study, a market allowance of 10% is applied to the gross residential, commercial and industrial land requirements. Although a 50-year horizon should facilitate one ownership

change for each parcel of land within the future growth areas, there is no guarantee a new buyer will be motivated to develop. Further, ownership changes in the near term of lands not expected to be developed until the later years of the Growth Study may result in some lands having multiple changes in ownership prior to development.

6.6 Quarter Section Size

A quarter section is 160 acres in size based on the dimensions of 0.5 miles by 0.5 miles. This area translates to 64.75 ha. Over time, municipalities acquire road allowance widening from quarter sections at the subdivision stage or through road plan registrations, which in turn reduces the developable area of the original quarter sections.

For the purpose of this Growth Study, the City has assumed an average quarter section size of 63.5 ha in recognition of titled area already lost to road widening.

7.0 Land Requirements

As presented in Table 19, the estimated total amount of gross developable lands required to meet City of Spruce Grove's 50-year growth needs to 2067 is 2,539.6 ha under the recommended Medium-High Case scenario, and based on the assumptions presented in Chapter 6.0. However, as presented in Table 13 in Chapter 4.0, the City only has an available gross developable land supply of 1,148.6 ha. Spruce Grove therefore needs at least another 1,390.9 ha of gross developable lands to accommodate its projected growth. This corresponds to at least 21.8 quarter sections of gross developable land. See Appendix B for a summary of the general approach used to generate the total gross developable land requirements presented in Table 19.

Table 19: Future Land Requirements

Land Use	Total Land Requirements (gross ha)	Remaining Lands in City (gross ha)	Lands Required Beyond City (gross ha)	Lands Required Beyond City (quarters)
Residential (including 75% Public Services)	1,656.9	762.2	894.7	14.0
Commercial	247.0	129.9	117.0	1.8
Industrial (including 25% Public Services)	635.7	256.5	379.2	5.9
Total Gross Developable	**2,539.6**	**1,148.6**	**1,390.9**	**21.8**
Gross Undevelopable Markup (10% assumed)	–	–	139.1	2.2
Total Gross	**–**	**–**	**1,530.0**	**24.0**

The 21.8 quarter sections of gross developable land presented above does not, however, include deductions for gross undevelopable overheads; that is portions of lands outside of Spruce Grove that are inevitably undevelopable. Examples of gross undevelopable overheads include, among other things:

- pipeline, power transmission line and utility right-of-ways;
- legislated setbacks from oil and gas wells;
- wetlands recommended for retention;
- recommended environmental reserve lands; and
- previously developed properties (e.g., country residential subdivisions).

To accommodate gross undevelopable overheads, a preliminary determination of expansion areas is undertaken based on the gross developable land requirements. Then, an investigation of the preliminary expansion areas is undertaken to determine the amount of gross undevelopable overheads within them. If there is insufficient gross developable lands within the preliminary expansion lands after deducting the gross developable overheads, additional lands are added to preliminary expansion areas. This iterative process is typically repeated until such time as the gross area of the expansion areas results in a minimum of gross developable lands that meets the requirements presented in Table 19.

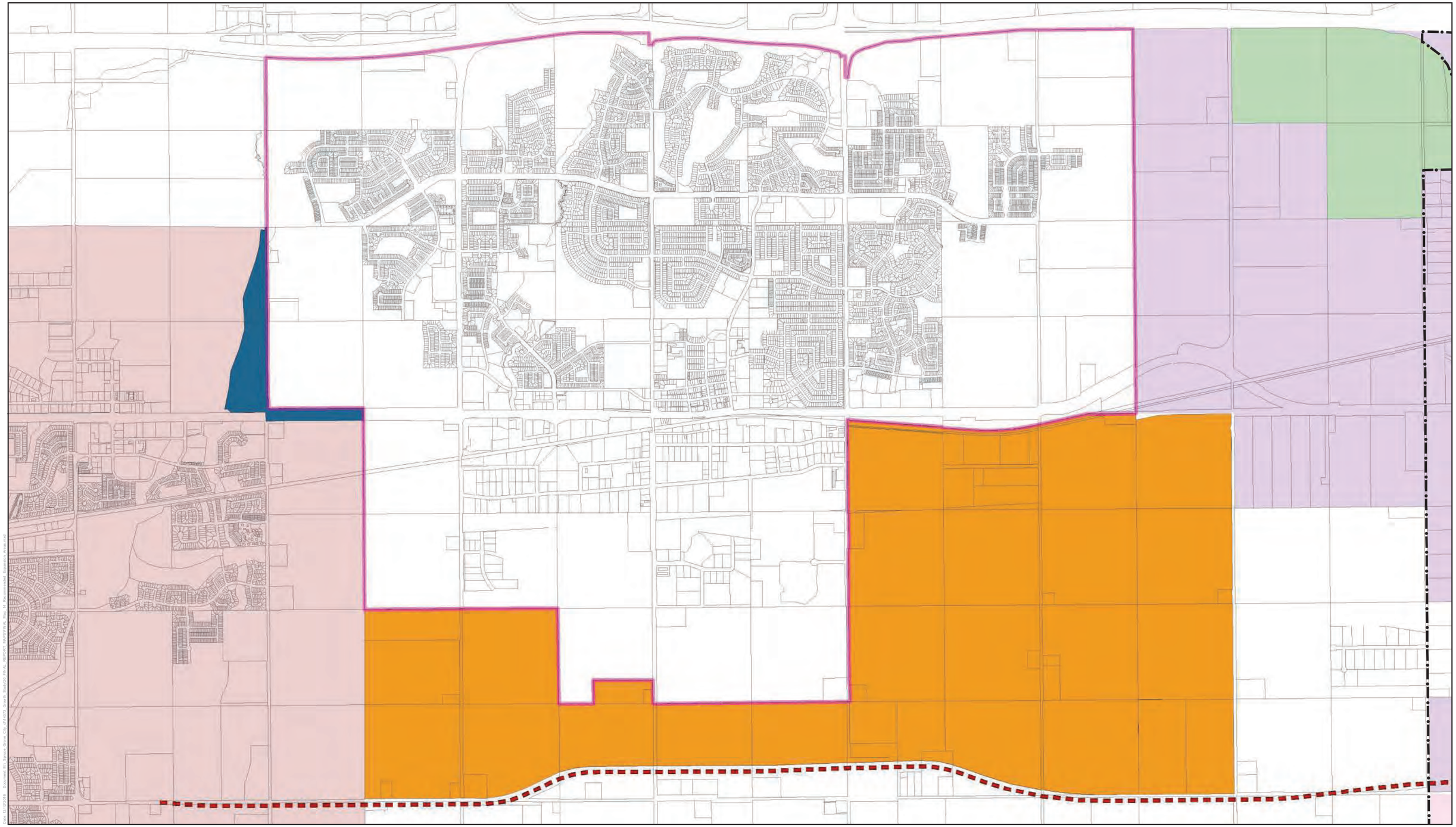
8.0 Recommended Expansion Areas

Based on the high growth of Spruce Grove and a quickly diminishing land supply to accommodate this growth, it is recommended that the City pursue a boundary adjustment in the short-term future in order to properly plan land uses and infrastructure investments in an orderly, comprehensive and sustainable manner. Utilizing a beyond boundary total gross developable land requirement of 1,390.9 ha (21.8 quarter sections) from Table 19, two expansion areas are recommended to accommodate the City of Spruce Grove's long-term residential, commercial, industrial and public services growth needs as illustrated in Map 14. The larger of the two is a south/southeast expansion area within Parkland County. The second is a small west expansion area within the Town of Stony Plain.

8.1 South/Southeast Expansion Area (Parkland County)

The recommended south/southeast expansion area comprises 1,384.9 ha of land within Parkland County (see Table 20). This expansion area is recommended based on the following criteria listed below.

1. It represents a logical extension of the City's existing urban footprint to the south and southeast on the south side of the CN main line where the City has already successfully planned and introduced urban development.
2. It allows for urban extension that facilitates increased alignment of future growth between Spruce Grove and Stony Plain to the west, which may result in some efficiencies in the coordination of intermunicipal infrastructure and service provision. The south side of the CN main line is where the majority of the neighbouring Town of Stony Plain has developed.
3. It facilitates the potential for long-term commercial development, particularly large format retail, highway corridor and transit-oriented mixed use opportunities, along the Highway 628 corridor, which will help contribute to maintaining the City's current assessment split of 82.5% residential to 17.5% non-residential.
4. It facilities contiguous southward expansion of the City's growing industrial park over the medium-term, which will be the most significant contributor to helping maintain the City's current assessment split of 82.5% residential to 17.5% non-residential, and possibly improving it further to a more favourable 80% to 20% split.
5. By keeping development of the City unified on the south side of Highway 16, it eliminates the need for the City to consider crossing Highway 16, thus avoiding the potential transfer of responsibility for the highway from Alberta Transportation to the City, and/or the responsibility for significant upgrades at both existing interchanges to accommodate growth on the north side of the highway.
6. It leverages future provincial investments in the planned upgrading of Highway 628 to the south, better spreading commuter traffic across three corridors to/from Edmonton to the east.
7. Urban expansion to the south and southeast can be more easily integrated into the City's existing and planned transportation network with four existing north-south crossings of the CN main line within a 4.8 km (3.0 mi) span compared to only two fixed crossings of Highway 16 at existing interchanges.
8. Urban expansion to the south and southeast allows for logical extensions of the City's existing water distribution system, either with or without system upgrades, and optimization of the existing regional water line running between Spruce Grove and Edmonton.
9. Urban expansion to the south and southeast allows for the continued extension of the City's existing wastewater collection system by gravity. Preliminary engineering indicates that the construction of forcemains and lift stations is not required to service these lands.
10. Subject to environmental review, urban expansion to the south and southeast allows for possible utilization of existing north-south watercourses to accommodate stormwater drainage.
11. The south expansion area corresponds to the conceptual south boundary of Priority Growth Area 'A' in the Capital Region Growth Plan.



Parcel
Study Area
City of Spruce Grove
Town of Stony Plain
Acheson Industrial ASP
Enoch Cree Nation
Wagner Natural Area
Future Realigned Highway 628
South/Southeast Expansion Area
West Expansion Area

ISL Engineering and Land Services

0 250 500 1,000 1,500 2,000 metres

1:30,000

The City of Spruce Grove

GROWTH STUDY • MAP 14
RECOMMENDED EXPANSION AREAS

12. The south expansion area allows for future urban development in a manner that will comply with the principles and policies of the Capital Region Growth Plan.

8.2 West Expansion Area (Stony Plain)

Within the Town of Stony Plain, there is a narrow strip of developable land north of Highway 16A that is situated between the Atim Creek ravine to the west and Boundary Road to the east. The development of this severed strip of land could be accommodated whether remaining within the jurisdiction of the Town of Stony Plain or having its municipal jurisdiction transferred to the City of Spruce Grove. However, development of these lands can be facilitated in a more cost-effective manner through the City than the Town.

If the subject lands were to remain within the Town, water service would either have to be extended across the Atim Creek ravine from the west or across Highway 16A from the south. As the strip of developable land is greater than 0.8 km (0.5 mi) in length, it is likely that the water main servicing the northern portion of the subject lands would require looping back into the Town's system by way of crossing the Atim Creek ravine a potential second time. It could be more economically feasible to tie water servicing for the subject lands into the City's future municipal water system that will eventually be extended to Boundary Road from the east.

From a wastewater perspective, a Town of Stony Plain wastewater trunk conveys flows by gravity from the east side of the community, south of Highway 16A, to the regional wastewater line running east-west 1.6 km (1.0 mi) north of Highway 16A. This wastewater trunk parallels Atim Creek on the west side of the ravine. For future development of the subject lands to tie into the Town's wastewater system, a wastewater sewer would have to cross under Atim Creek and a lift station would have to be constructed to empty flows into the Town's existing wastewater main. It would be more economically feasible for municipal wastewater servicing to be provided by the City of Spruce Grove where flows could be conveyed north on the east side of the Atim Creek ravine to the regional wastewater line within Spruce Grove, possibly within Boundary Road, which is planned to be upgraded and realigned by the City.

Boundary Road north of Highway 16A, which runs between the subject lands and the City of Spruce Grove's west boundary, is currently under the jurisdiction of the Town of Stony Plain. To the northeast, Spruce Grove has recently planned for Grove Drive – an east-west arterial road 1.6 km (1.0 mi) north of Highway 16A – to be upgraded and realigned in a southwest direction to eventually continue as Boundary Road south to Highway 16A. Access to the subject lands will be from Boundary Road unless the Town and the Province is willing to approve development of a road crossing over Atim Creek. Development approvals facilitated by the Town for the subject lands would require careful coordination of access approvals by both the Town, as the municipality with authority over Boundary Road, and the City, as the municipal jurisdiction adjacent to the east side of Boundary Road. Further, the City may seek offsite levies from the developers of the subject lands through some sort of intermunicipal agreement with the Town to pay their proportionate benefitting share of the City's upgrades to Grove Drive/Boundary Road.

To facilitate the most cost-effective development of the subject lands and to minimize intermunicipal dependencies for planning approvals and infrastructure investment cost recoveries, it is recommended that the City approach the Town about transferring the municipal jurisdiction of the subject lands. In particular, it is recommended that Lot 1, Plan 932 2978 in its entirety and all those portions of the E½-6-53-27-W4M located east of the eastern boundary of Sanitary Sewer Right-of-Way Plan 862 0338 be transferred from the Town of Stony Plain to the City of Spruce Grove.

The subject lands amount to 40.9 ha (see Table 20) including the Atim Creek ravine north of Highway 16A. This would coincide with an expectation that the City would take on the responsibility to maintain the ravine and any active and passive recreation facilities developed within or adjacent to the east side of the ravine. Responsibility for the recreation facilities is a reasonable expectation as future residential and commercial development on the developable portion of the subject lands would be the primary beneficiaries of these

investments. It would also be appropriate for the City to take on these responsibilities and costs as it would be collecting taxes from the adjacent developable portion of the subject lands being transferred.

The subject lands also includes transfer of the Highway 16A right-of-way, east of the west edge of the Boundary Road right-of-way, from the Town to the City for the City to facilitate acquisition of authority over the 0.8 km (0.5 mi) stretch of the road from Alberta Transportation. This in turn would allow the City to introduce increased access opportunities to benefit future commercial development already within its jurisdiction on the north side of Highway 16A.

8.3 Preliminary Land Use Breakdown

Preliminary land uses for the recommended expansion areas are illustrated in Map 15. Table 20 summarizes the gross area (1,425.9 ha or 22.5 quarter sections), the gross undevelopable deductions and then the preliminary land use breakdowns within the expansion areas, resulting in a gross developable area of 1,263.7 ha or 19.9 quarter sections.

The 1,384.9 ha (21.8 quarter sections) in the south/southeast expansion area is estimated to provide 1,248.9 ha of gross developable land to accommodate future residential, commercial, industrial and public services growth. The 40.9 ha (0.6 quarter sections) in the west expansion area is estimated to provide 14.8 ha of gross developable land to accommodate a modest amount of additional residential and commercial growth. Combined, these two expansion areas are estimated to provide 1,263.7 ha of gross developable land, which falls short of meeting the gross developable land requirements of 1,390.9 ha presented in Table 19 under the recommended Medium-High Case Scenario. The two recommended expansions areas therefore result in a deficiency of 127.2 ha (2.0 quarter sections) in relation to the land requirements presented in Table 19.

Table 20: Preliminary Land Use Breakdown of Recommended Expansion Areas

Land Use	Expansion Areas (ha)			Land Required (ha) per Table 19	Difference (ha)
	South/ Southeast (Parkland County)	West (Town of Stony Plain)	Total		
Gross Area of Expansion Lands	**1,384.9**	**40.9**	**1,425.9**	**—**	**—**
Environmental Reserve	27.4	14.2	41.5	—	—
Pipelines	55.4	0.3	55.7	—	—
Rail	10.7	0.0	10.7	—	—
Road Allowance	19.5	11.7	31.2	—	—
Well Setbacks	23.1	0.0	23.1	—	—
Total Gross Developable Lands	**1,248.9**	**14.8**	**1,263.7**	**1,390.9**	**-127.2**
Residential (including 75% Public Services)	758.5	9.0	767.5	894.7	-127.2
Commercial	111.2	5.8	117.0	117.0	0.0
Industrial (including 25% Public Services)	379.2	0.0	379.2	379.2	0.0

* The land use designations shown here are preliminary only. Ultimately, future land use designations will be formally assigned to lands within the proposed expansion areas through an update to the City's Municipal Development Plan after a boundary adjustment is approved. Future designations of these lands will be informed by things such as: input from the public, affected landowners and other stakeholders through a public consultation program; more detailed technical review of development potential; and land use and infrastructure planning principles and best practices.

ISL Engineering and Land Services

0 250 500 1,000 1,500 2,000 metres

- Parcel
- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial ASP
- Enoch Cree Nation
- Wagner Natural Area
- Future Realigned Highway 628
- Residential
- Commercial
- Industrial
- Environmental Reserve
- Pipeline/Well Setback
- Rail
- Road Allowance

N

1:30,000

The City of SPRUCE GROVE

GROWTH STUDY • MAP 15
PRELIMINARY LAND USES WITHIN EXPANSION AREAS

8.4 Northwest Expansion (Parkland County)

Recommended expansion areas have not been identified within Parkland County to the northwest of the City, between Highway 16 to the north and Stony Plain to the south, for the following reasons:

1. These lands have been previously identified by Parkland County to accommodate its own growth through its adoption of the Fifth Meridian ASP in 2001. The ASP designates the lands for a mix of estate residential, country residential, industrial business, public services, open space, and parks and recreation purposes.
2. These lands would require a major access link – an arterial road – to cross over Atim Creek to integrate it with the City of Spruce Grove. The City recently investigated the possibility of extending Grove Drive, an east/west arterial road, over Atim Creek at the previously planned location along the section line, but that along with other locations, was determined to be an unfeasible creek crossing location, partially due to the presence of the sewer right-of-way on the west side of the creek. As a result, the City recently amended its municipal development plan (MDP) to realign Grove Drive in a southwest direction to eventually continue as Boundary Road. Boundary Road is a north/south roadway that parallels Atim Creek and forms the west boundary between Spruce Grove and Stony Plain north of Highway 16A.
3. Similarly, these lands are isolated due to other access constraints including Highway 16 to the north and Highway 779 to the west. This isolation usually requires either more frequent major accesses or wider major accesses than typically required. For example, it may require arterial roads spaced closer than the typical 1600 m grid for arterial roads that are six lanes instead of four lanes. Transportation linkages to accommodate future growth in this area would therefore be better enabled through Stony Plain to the south.
4. These lands are not serviceable by gravity to the City's existing wastewater collection system or the ACRWC Parkland Trunk.
5. There is a proliferation of watercourses, wetlands and associated natural areas in the easternmost portion of this area, which limits the amount of gross developable lands available to accommodate future urban growth. The quarter section in the northeast portion of this area is also owned by the Government of Alberta and managed by the Alberta Conservation Association, making transfer of these lands to enable urban development unlikely.
6. These lands do not have the same efficiencies and benefits to Spruce Grove as previously presented above for the recommended south/southeast and west expansion areas described above.

8.5 North/Northeast Expansion (Parkland County)

Recommended expansion areas have not been identified within Parkland County to north and northeast across Highway 16 for the following reasons:

1. Aside from the strip of ten quarter sections on the immediate north side of Highway 16 that are identified as a fringe area of mutual intermunicipal interest between the City and County, the remainder of these lands are planned to accommodate future County growth in the form of country residential, manufactured home park, highway commercial and recreational land uses.
2. Expansion into lands on the north side of Highway 16 may trigger the potential transfer of responsibility for the highway from Alberta Transportation to Spruce Grove due to its status as an incorporated city, and/or the responsibility for significant upgrades at both existing interchanges to accommodate growth on the north side of the highway.
3. Urban expansion to the north and northeast possess limited integration into the City's existing and planned transportation network as there are only two fixed crossings of Highway 16 at existing interchanges between Highway 779 in the west and Highway 44 in the east.
4. Township Road 532A will become the major access into the area. Its capacity pinch points will be at Highway 44 to the east, Century Road (Range Road 272) in the central area and Jennifer Heil Way/Campsite Road (Range Road 274) to the west, as these are the only access points in and out of the area. Thus Township Road 532A and these intersections likely require significant upgrades. For

example, Township Road 532A may need to be six lanes wide in places and the intersections likely require dual turning lanes and special auxiliary lanes to Highway 16.

5. Urban expansion across Highway 16 would result in the establishment of a new water pressure zone for integration into the City's existing water distribution system.
6. The vast majority of the lands across Highway 16 are not serviceable by gravity. Urban expansion on these lands would require the construction of forcemains and lift stations.
7. Lands to the north, across Highway 16, are not currently located within the conceptual boundaries of a designated Priority Growth Area in the Capital Region Growth Plan. Rather, they are located in the conceptual boundaries of a Cluster Country Residential Area, which is not anticipated to accommodate future growth at urban densities.
8. Due to the absence of being within a Priority Growth Area, it cannot be assured that future urban development on these lands will comply with the principles and policies of the Capital Region Growth Plan.
9. Policy within the City's MDP prescribes that Highway 16 shall remain Spruce Grove's northern limit.
10. These lands do not have the same efficiencies and benefits to Spruce Grove as previously presented above for the recommended south/southeast and west expansion areas.

8.6 East Expansion (Parkland County)

Recommended expansion areas have not been identified within Parkland County to east of the City, between Highways 16 and 16A, for the following reasons:

1. The future growth potential of this area would likely be limited to a maximum of seven quarter sections due to the presence of:
   a. the Wagner Natural Area in the northeast;
   b. existing country residential development (Osborne Acres) and planned industrial development across Spruce Valley Road (Range Road 265) to the east; and
   c. existing and planned industrial development across the CN main line to the southeast.
2. Eastward expansion onto these lands could result in eventual urban development adjacent to the west, southwest and south of the Wagner Natural Area.
3. These lands are 2.4 km (1.5 mi) east of the existing Highway 16 interchange at Century Road (Range Road 272), while the Wagner Natural Area and Osborne Acres pose as barriers to the provision of a direction transportation connection to the existing Highway 16 interchange at Highway 44/Range Road 531A.
4. These lands have limited access opportunities to Highway 16A to the south, in part due to curves and the grade separated overpass of the CN main line, as well as the rail line itself.
5. These lands have no direct east/west connections to Highway 60 within the core of the Acheson Industrial Area to the east. One or more direct connections to Highway 60 could have conveyed traffic originating from development on these lands to Highways 16 and 16A. Regardless however, it is generally undesirable to mix industrial traffic with residential traffic originating from east Spruce Grove and these lands. While a north/south arterial would intercept some of this traffic, all traffic would be required to go south to Highway 16A, likely via Spruce Valley Road (Range Road 265).
6. Overall, integration of this area's transportation network with the surrounding provincial highway network – Highways 16, 16A and 60 to the north, south and east respectively – will be difficult and inefficient.
7. These lands do not have the same efficiencies and benefits to Spruce Grove as previously presented above for the recommended south/southeast and west expansion areas described above.

9.0 Development Staging

Tables 21 through 23 present the amounts of residential, commercial and industrial lands consumed by year under the recommended Medium-High Case Scenario. Public services land requirements are embedded within Tables 21 and 23 with 75% and 25% distributed to the residential and industrial land requirements respectively. The amount of land consumed is based on the scenario's growth rates presented in Table 12 in Chapter 3.0 and the assumptions presented in Chapter 6.0.

The consumption of lands in Tables 21 through 23 include the assumptions that:

- 100% of the City's future residential and industrial growth will be accommodated within its current limits for the first fifteen years (2016-2030); and
- 100% of the City's future commercial growth will be accommodated within its current limits for the first ten years (2016-2025).

These assumptions are applied as it is anticipated to take up to five years to complete the boundary adjustment application process through to an approval by the Province of Alberta, followed by another five years to complete the prerequisite land use planning approvals for the recommended expansion areas prior to approval and registration of the first subdivision within these areas (e.g., a municipal development plan update and preparation and approval of one or more area structure plans). Furthermore, the assumptions recognize that the City currently has 18-26 years of land supply for residential, commercial and industrial growth.

Starting in 2031, the assumption is that 78% and 75% of Spruce Grove's residential and industrial growth will be absorbed by the residential and industrial land supplies within the City's current limits respectively, with the balance being absorbed by land supplies within the recommended expansion areas.[27] This occurs until the residential and industrial land supplies within the City's current limits are fully subdivided, after which 100% of the growth occurs within the recommended expansion areas.

For future commercial growth, the consumption of land within the recommended expansion areas is assumed to start earlier in part to recognize that the unmotivated landowners on the west side of Spruce Grove may continue to hold onto their lands in the short-term future, necessitating the earlier consumption of lands within the expansion areas to accommodate projected demand. Starting in 2026, the assumption for commercial land consumption is that 75% of Spruce Grove's commercial growth will be absorbed by the land supply within the City's current limits, with the balance being absorbed by land supply within the recommended expansion areas. Five years later, starting in 2031, it is assumed commercial growth will be shared 50/50 between lands within and beyond the City's current limits. This occurs until the commercial land supply within the City's current limits are fully subdivided, after which 100% of the growth occurs within the recommended expansion areas.

To establish a foundation for the Financial Impact Assessment prepared by CORVUS Business Advisors, a staging plan was prepared to conceptually illustrate how the remaining available lands within the City and the lands within recommended expansion areas may be consumed over time. As illustrated in Map 16, the conceptual staging plan shows land consumed in five-year intervals based on the estimated amount of lands consumed by year by land use as illustrated in Tables 21 through 23. The first interval is seven years however to be inclusive of the two stub years.

[27] The assumed staging of total residential land requirements to the City between 2031 and 2039 inclusive is based on 75% of the population growth occurring within the City's current boundaries before factoring market allowance and the associated allocation of public services land requirements to occur within residential growth areas. After factoring market allowance and its public services allocation, this assumption increases to 78.4% from a staging perspective, hence the 78%/22% split for 2031 to 2039 in Table 21 rather than a 75%/25% split.

The key land use planning principle used to develop the staging plan was that development within each five-year interval would be contiguous with previously developed lands. This would enable the optimization of investment in supporting capital infrastructure and future operating and service delivery costs. It would also expand the municipal footprint in a responsible manner.

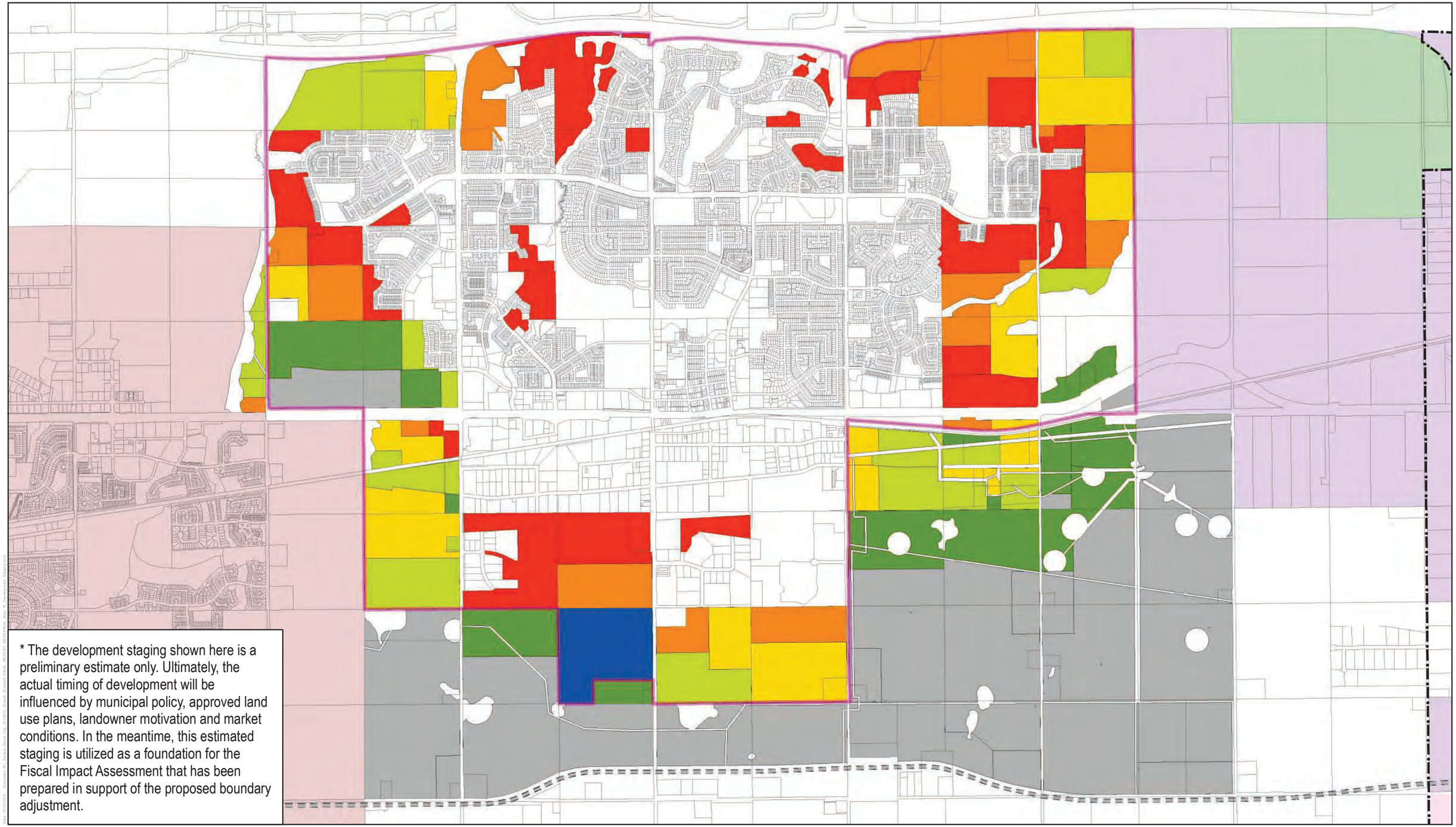
Other influences to the staging plan were:

- The short-term need for additional commercial lands proximate to Highway 16A;
- Proximity and access to existing major transportation infrastructure (Highway 16A) and future municipal transportation investments (extension and realignment of Grove Drive/Boundary Road); and
- Proximity to existing and future water and wastewater infrastructure.

It is important to note that the staging plan illustrated in Map 16 is a conceptual estimate generally based on the principle and influences mentioned above. Ultimately, municipal policy, approved land use plans and market forces will dictate the actual staging of development once a boundary adjustment occurs. In the meantime, the staging plan illustrated is realistic and sufficient for establishing the foundation for the Fiscal Impact Assessment.

Table 21: Estimated Annual Residential and 75% Public Services Land Consumption

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2016	27.9	100	0	762.2	27.9	734.3	767.5	0.0	767.5
2017	29.2	100	0	734.3	29.2	705.1	767.5	0.0	767.5
2018	32.9	100	0	705.1	32.9	672.2	767.5	0.0	767.5
2019	35.2	100	0	672.2	35.2	636.9	767.5	0.0	767.5
2020	35.6	100	0	636.9	35.6	601.4	767.5	0.0	767.5
2021	34.6	100	0	601.4	34.6	566.8	767.5	0.0	767.5
2022	34.1	100	0	566.8	34.1	532.7	767.5	0.0	767.5
2023	34.6	100	0	532.7	34.6	498.1	767.5	0.0	767.5
2024	34.5	100	0	498.1	34.5	463.6	767.5	0.0	767.5
2025	34.8	100	0	463.6	34.8	428.8	767.5	0.0	767.5
2026	34.6	100	0	428.8	34.6	394.2	767.5	0.0	767.5
2027	34.6	100	0	394.2	34.6	359.5	767.5	0.0	767.5
2028	34.6	100	0	359.5	34.6	325.0	767.5	0.0	767.5
2029	34.7	100	0	325.0	34.7	290.2	767.5	0.0	767.5
2030	34.7	100	0	290.2	34.7	255.5	767.5	0.0	767.5
2031	33.3	78	22	255.5	26.1	229.4	767.5	7.2	760.3
2032	33.3	78	22	229.4	26.1	203.3	760.3	7.2	753.1
2033	33.5	78	22	203.3	26.3	177.0	753.1	7.2	745.8
2034	33.8	78	22	177.0	26.5	150.5	745.8	7.3	738.5
2035	34.0	78	22	150.5	26.6	123.8	738.5	7.3	731.2
2037	34.6	78	22	97.0	27.1	69.9	723.8	7.5	716.3
2038	34.8	78	22	69.9	27.3	42.5	716.3	7.5	708.8



* The development staging shown here is a preliminary estimate only. Ultimately, the actual timing of development will be influenced by municipal policy, approved land use plans, landowner motivation and market conditions. In the meantime, this estimated staging is utilized as a foundation for the Fiscal Impact Assessment that has been prepared in support of the proposed boundary adjustment.

ISL Engineering and Land Services

0 250 500 1,000 1,500 2,000 metres

- Parcel
- Study Area
- City of Spruce Grove
- Town of Stony Plain
- Acheson Industrial ASP
- Enoch Cree Nation
- Wagner Natural Area
- Future Realigned Highway 628
- NAIT Campus
- 2016 to 2022
- 2023 to 2027
- 2028 to 2032
- 2033 to 2037
- 2038 to 2042
- Beyond 2042

N

1:30,000

The City of Spruce Grove

GROWTH STUDY • MAP 16
DEVELOPMENT STAGING

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2039	35.2	78	22	42.5	27.6	14.9	708.8	7.6	701.2
2040	33.2	45	55	14.9	14.9	0.0	701.2	18.3	682.9
2041	30.7	0	100	0.0	0.0	0.0	682.9	30.7	652.2
2042	30.0	0	100	0.0	0.0	0.0	652.2	30.0	622.2
2043	30.0	0	100	0.0	0.0	0.0	622.2	30.0	592.3
2044	30.0	0	100	0.0	0.0	0.0	592.3	30.0	562.3
2045	30.0	0	100	0.0	0.0	0.0	562.3	30.0	532.3
2046	30.0	0	100	0.0	0.0	0.0	532.3	30.0	502.3
2047	30.0	0	100	0.0	0.0	0.0	502.3	30.0	472.3
2048	30.0	0	100	0.0	0.0	0.0	472.3	30.0	442.4
2049	30.0	0	100	0.0	0.0	0.0	442.4	30.0	412.4
2050	30.0	0	100	0.0	0.0	0.0	412.4	30.0	382.4
2051	30.0	0	100	0.0	0.0	0.0	382.4	30.0	352.4
2052	30.0	0	100	0.0	0.0	0.0	352.4	30.0	322.4
2053	30.0	0	100	0.0	0.0	0.0	322.4	30.0	292.5
2054	30.0	0	100	0.0	0.0	0.0	292.5	30.0	262.5
2055	30.0	0	100	0.0	0.0	0.0	262.5	30.0	232.5
2056	30.0	0	100	0.0	0.0	0.0	232.5	30.0	202.5
2057	30.0	0	100	0.0	0.0	0.0	202.5	30.0	172.5
2058	30.0	0	100	0.0	0.0	0.0	172.5	30.0	142.6
2059	30.0	0	100	0.0	0.0	0.0	142.6	30.0	112.6
2060	30.0	0	100	0.0	0.0	0.0	112.6	30.0	82.6
2061	30.0	0	100	0.0	0.0	0.0	82.6	30.0	52.6
2062	30.0	0	100	0.0	0.0	0.0	52.6	30.0	22.6
2063	30.0	0	100	0.0	0.0	0.0	22.6	30.0	-7.3
2064	30.0	0	100	0.0	0.0	0.0	-7.3	30.0	-37.3
2065	30.0	0	100	0.0	0.0	0.0	-37.3	30.0	-67.3
2066	30.0	0	100	0.0	0.0	0.0	-67.3	30.0	-97.3
2067	30.0	0	100	0.0	0.0	0.0	-97.3	30.0	-127.3
Total	**1,656.9**	—	—	—	**762.2**	—	—	**894.7**	—

Table 22: Estimated Annual Commercial Land Consumption

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2016	4.2	100	0	129.9	4.2	125.8	117.0	0.0	117.0
2017	4.4	100	0	125.8	4.4	121.4	117.0	0.0	117.0
2018	4.9	100	0	121.4	4.9	116.5	117.0	0.0	117.0
2019	5.3	100	0	116.5	5.3	111.3	117.0	0.0	117.0
2020	5.3	100	0	111.3	5.3	106.0	117.0	0.0	117.0
2021	5.2	100	0	106.0	5.2	100.8	117.0	0.0	117.0
2022	5.1	100	0	100.8	5.1	95.7	117.0	0.0	117.0
2023	5.2	100	0	95.7	5.2	90.6	117.0	0.0	117.0
2024	5.1	100	0	90.6	5.1	85.4	117.0	0.0	117.0
2025	5.2	100	0	85.4	5.2	80.2	117.0	0.0	117.0
2026	5.2	75	25	80.2	3.9	76.4	117.0	1.3	115.8
2027	5.2	75	25	76.4	3.9	72.5	115.8	1.3	114.5
2028	5.2	75	25	72.5	3.9	68.6	114.5	1.3	113.2
2029	5.2	75	25	68.6	3.9	64.8	113.2	1.3	111.9
2030	5.2	75	25	64.8	3.9	60.9	111.9	1.3	110.6
2031	5.0	50	50	60.9	2.5	58.4	110.6	2.5	108.1
2032	5.0	50	50	58.4	2.5	55.9	108.1	2.5	105.6
2033	5.0	50	50	55.9	2.5	53.4	105.6	2.5	103.1
2034	5.0	50	50	53.4	2.5	50.9	103.1	2.5	100.6
2035	5.1	50	50	50.9	2.5	48.4	100.6	2.5	98.1
2036	5.1	50	50	48.4	2.6	45.8	98.1	2.6	95.5
2037	5.2	50	50	45.8	2.6	43.2	95.5	2.6	92.9
2038	5.2	50	50	43.2	2.6	40.6	92.9	2.6	90.3
2039	5.3	50	50	40.6	2.6	38.0	90.3	2.6	87.7
2040	5.0	50	50	38.0	2.5	35.5	87.7	2.5	85.2
2041	4.6	50	50	35.5	2.3	33.2	85.2	2.3	83.0
2042	4.5	50	50	33.2	2.2	31.0	83.0	2.2	80.7
2043	4.5	50	50	31.0	2.2	28.8	80.7	2.2	78.5
2044	4.5	50	50	28.8	2.2	26.5	78.5	2.2	76.3
2045	4.5	50	50	26.5	2.2	24.3	76.3	2.2	74.0
2046	4.5	50	50	24.3	2.2	22.1	74.0	2.2	71.8
2047	4.5	50	50	22.1	2.2	19.8	71.8	2.2	69.6
2048	4.5	50	50	19.8	2.2	17.6	69.6	2.2	67.3
2049	4.5	50	50	17.6	2.2	15.4	67.3	2.2	65.1
2050	4.5	50	50	15.4	2.2	13.1	65.1	2.2	62.8
2051	4.5	50	50	13.1	2.2	10.9	62.8	2.2	60.6
2052	4.5	50	50	10.9	2.2	8.7	60.6	2.2	58.4

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2053	4.5	50	50	8.7	2.2	6.4	58.4	2.2	56.1
2054	4.5	50	50	6.4	2.2	4.2	56.1	2.2	53.9
2055	4.5	50	50	4.2	2.2	2.0	53.9	2.2	51.7
2056	4.5	44	56	2.0	2.0	0.0	51.7	2.5	49.2
2057	4.5	0	100	0.0	0.0	0.0	49.2	4.5	44.7
2058	4.5	0	100	0.0	0.0	0.0	44.7	4.5	40.2
2059	4.5	0	100	0.0	0.0	0.0	40.2	4.5	35.8
2060	4.5	0	100	0.0	0.0	0.0	35.8	4.5	31.3
2061	4.5	0	100	0.0	0.0	0.0	31.3	4.5	26.8
2062	4.5	0	100	0.0	0.0	0.0	26.8	4.5	22.4
2063	4.5	0	100	0.0	0.0	0.0	22.4	4.5	17.9
2064	4.5	0	100	0.0	0.0	0.0	17.9	4.5	13.4
2065	4.5	0	100	0.0	0.0	0.0	13.4	4.5	8.9
2066	4.5	0	100	0.0	0.0	0.0	8.9	4.5	4.5
2067	4.5	0	100	0.0	0.0	0.0	4.5	4.5	0.0
Total	**247.0**	—	—	—	**129.9**	—	—	**117.0**	—

Table 23: Estimated Annual Industrial and 25% Public Services Land Consumption

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2016	10.7	100	0	256.5	10.7	245.8	379.2	0.0	379.2
2017	11.2	100	0	245.8	11.2	234.6	379.2	0.0	379.2
2018	12.6	100	0	234.6	12.6	222.0	379.2	0.0	379.2
2019	13.5	100	0	222.0	13.5	208.5	379.2	0.0	379.2
2020	13.6	100	0	208.5	13.6	194.8	379.2	0.0	379.2
2021	13.3	100	0	194.8	13.3	181.6	379.2	0.0	379.2
2022	13.1	100	0	181.6	13.1	168.5	379.2	0.0	379.2
2023	13.3	100	0	168.5	13.3	155.2	379.2	0.0	379.2
2024	13.3	100	0	155.2	13.3	141.9	379.2	0.0	379.2
2025	13.3	100	0	141.9	13.3	128.6	379.2	0.0	379.2
2026	13.3	100	0	128.6	13.3	115.3	379.2	0.0	379.2
2027	13.3	100	0	115.3	13.3	102.0	379.2	0.0	379.2
2028	13.3	100	0	102.0	13.3	88.8	379.2	0.0	379.2
2029	13.3	100	0	88.8	13.3	75.4	379.2	0.0	379.2
2030	13.3	100	0	75.4	13.3	62.1	379.2	0.0	379.2
2031	12.8	75	25	62.1	9.6	52.5	379.2	3.2	376.0
2032	12.8	75	25	52.5	9.6	42.9	376.0	3.2	372.8
2033	12.9	75	25	42.9	9.7	33.3	372.8	3.2	369.6
2034	13.0	75	25	33.3	9.7	23.6	369.6	3.2	366.3
2035	13.0	75	25	23.6	9.8	13.8	366.3	3.3	363.1
2036	13.1	75	25	13.8	9.9	3.9	363.1	3.3	359.8
2037	13.3	30	70	3.9	3.9	0.0	359.8	9.3	350.5
2038	13.4	0	100	0.0	0.0	0.0	350.5	13.4	337.1
2039	13.5	0	100	0.0	0.0	0.0	337.1	13.5	323.6
2040	12.8	0	100	0.0	0.0	0.0	323.6	12.8	310.8
2041	11.8	0	100	0.0	0.0	0.0	310.8	11.8	299.0
2042	11.5	0	100	0.0	0.0	0.0	299.0	11.5	287.5
2043	11.5	0	100	0.0	0.0	0.0	287.5	11.5	276.0
2044	11.5	0	100	0.0	0.0	0.0	276.0	11.5	264.5
2045	11.5	0	100	0.0	0.0	0.0	264.5	11.5	253.0
2046	11.5	0	100	0.0	0.0	0.0	253.0	11.5	241.5
2047	11.5	0	100	0.0	0.0	0.0	241.5	11.5	230.0
2048	11.5	0	100	0.0	0.0	0.0	230.0	11.5	218.5
2049	11.5	0	100	0.0	0.0	0.0	218.5	11.5	207.0
2050	11.5	0	100	0.0	0.0	0.0	207.0	11.5	195.5
2051	11.5	0	100	0.0	0.0	0.0	195.5	11.5	184.0
2052	11.5	0	100	0.0	0.0	0.0	184.0	11.5	172.5

Year	Total Land Req'd (ha)	Total Land to City (%)	Total Land to Annex. Area (%)	Opening City Lands Avail. (ha)	City Lands Consumed (ha)	Closing City Lands Avail. (ha)	Opening Annex. Lands Avail. (ha)	Annex. Lands Consumed (ha)	Closing Annex. Lands Avail. (ha)
2053	11.5	0	100	0.0	0.0	0.0	172.5	11.5	161.0
2054	11.5	0	100	0.0	0.0	0.0	161.0	11.5	149.5
2055	11.5	0	100	0.0	0.0	0.0	149.5	11.5	138.0
2056	11.5	0	100	0.0	0.0	0.0	138.0	11.5	126.5
2057	11.5	0	100	0.0	0.0	0.0	126.5	11.5	115.0
2058	11.5	0	100	0.0	0.0	0.0	115.0	11.5	103.5
2059	11.5	0	100	0.0	0.0	0.0	103.5	11.5	92.0
2060	11.5	0	100	0.0	0.0	0.0	92.0	11.5	80.5
2061	11.5	0	100	0.0	0.0	0.0	80.5	11.5	69.0
2062	11.5	0	100	0.0	0.0	0.0	69.0	11.5	57.5
2063	11.5	0	100	0.0	0.0	0.0	57.5	11.5	46.0
2064	11.5	0	100	0.0	0.0	0.0	46.0	11.5	34.5
2065	11.5	0	100	0.0	0.0	0.0	34.5	11.5	23.0
2066	11.5	0	100	0.0	0.0	0.0	23.0	11.5	11.5
2067	11.5	0	100	0.0	0.0	0.0	11.5	11.5	0.0
Total	**635.7**	—	—	—	**256.5**	—	—	**379.2**	—

10.0 Summary and Conclusions

1. In the last 50 years, the City of Spruce Grove's population has increased at an average annual rate of 8.4%, from 580 in 1966 to 33,640 in 2016.
2. At its 2016 population of 33,640, the City has nearly tripled its population over the past 33 years since recording a population of 11,307 in its 1983 municipal census.
3. More than 50% of the City's growth since 2001 has occurred in the past six years since 2010 and more than 75% has occurred in the past nine years since 2007.
4. Between 2006 and 2011, Spruce Grove was the fourth-fastest growing city and seventh-fastest growing municipality in Alberta, behind only Beaumont and Leduc within the Capital Region. Since 2011, Spruce Grove has recorded the third-highest growth rate in the Capital Region between 2011 and 2016 at 5.1%, behind Beaumont and Fort Saskatchewan at 5.9% and 5.2% respectively.
5. Previously smaller in population than Stony Plain, Spruce Grove's population surpassed Stony Plain's population in the early 1970s and now has twice the population of Stony Plain, while the 2016 federal census is anticipated to confirm that Spruce Grove's population has surpassed Parkland County's population.
6. Spruce Grove's historical population growth pattern over the past 50 years is reflective of, among other things, the City's: proximity to employment opportunities within the Acheson Industrial Area; proximity to a large population and employment base within the Capital Region that attracts global economic opportunities and advantages; high quality of life that makes Spruce Grove attractive to families; and low infrastructure costs that makes it attractive to developers.
7. Among other things, Spruce Grove's accelerated growth pattern over the past 10 years is reflective of the: increased development and employment opportunities within the Acheson Industrial Area; joint intermunicipal investments in social capital infrastructure; and efficient commuting corridors to Edmonton and other employment areas.
8. In 2013, the Capital Region Board (CRB) published two population growth scenarios for the City of Spruce Grove, which were subsequently adjusted in 2014. In the CRB Low Adjusted Scenario, the City was estimated to grow at an average annual growth rate of 1.9% to 54,500 in 2044 – a change of 70%. In the CRB High Adjusted Scenario, the City was estimated to grow at an average annual growth rate of 2.9% to 73,400 in 2044 – a change of 129%.
9. Independent of the CRB's population growth scenarios, the Growth Study presents four sets of alternative scenarios – Low, Medium, Medium-High and High Cases – which are based on Alberta Treasury Board and Finance (ATBF) Census Division (CD) Population Projections for Alberta. In these scenarios, Spruce Grove is anticipated to accommodate 4.35% of the projected population growth of CD No. 11, which includes the Capital Region. This assumption is less than the 4.42% share of growth Spruce Grove recorded between 2001 and 2015.
10. The Growth Study's Medium-High Case has been utilized for calculating future land requirements for the City. In this scenario, Spruce Grove experiences an average annual growth rate of 2.9% to 73,733 in 2044 – a change of 130%. This growth rate of 2.9% per annum is appropriate as it is in alignment with the 2.9% per annum growth rate of the CRB's High Adjusted Scenario.
11. To the 50-year horizon in the Growth Study, the Medium-High Case projects the City will experience an average annual growth rate of 2.4% to 108,744 in 2067 – a change of 239%. This average annual growth rate of 2.4% is conservative and appropriate as it is considerably below the 8.4% per annum growth rate Spruce Grove experienced in the previous 50 years, and less than half of the 5.6% per annum growth rate experienced in the last 10 years.
12. In the 10-year period between 2005 and 2014 inclusive, the total amount of lands consumed through the plan registration process in the City of Spruce Grove amounted to 633.5 ha.
13. With an average annual absorption of 63.3 ha of land over the past 10 years, and with 1,148.6 ha of lands available to accommodate future growth, it could take 18 years to absorb these lands through plan

registration (e.g., subdivision plans, road plans, etc.) if this annual absorption rate were to remain constant and if there was flexibility in land use over the City's available land supply.

14. As of the end of 2015, the City of Spruce Grove had 719 ha of gross residential land supply, 130 ha of gross commercial land supply and 234 ha of gross industrial land supply available to accommodate future growth. Under the recommended Medium-High Case Scenario, it is estimated that these land supplies will be fully absorbed within the next 18 to 26 years (between 2033 and 2041).
15. It is prudent that a future growth strategy be initiated in the short-term to maintain a 50-year supply of residential, commercial and industrial lands in the City before the supply is depleted to levels where there is a minimal number of developers remaining, or where a significant amount of the remaining available lands are held by unmotivated landowners. Over time, these parties will gain a disproportionately high level of control over the market, which is not a desirable position for a high growth municipality such as Spruce Grove. In the short-term, the affordability of the City's residential, commercial and industrial markets for the end user could be compromised and there could be a negative effect on the community's ability to optimize its growth potential.
16. Expansion areas in the amount of 22.5 quarter sections have been recommended to accommodate the City of Spruce Grove's future growth to 2067. The 22.5 quarter sections includes an allowance for market attractiveness and competition among developers and to recognize that some landowners within the recommended expansion areas may not participate in urban development by the end of 2067.
17. After deducting 2.6 quarter sections of adjacent undevelopable lands (e.g., environmental reserve, pipelines, rail, road allowances and well setbacks), the recommended expansion areas will provide approximately 19.9 quarter sections (or 1,264 ha) of gross developable lands to accommodate 91% of the 21.9 quarter sections (1,391 ha) of land required to accommodate the City's future residential, commercial, industrial and public services growth to 2067. Expansion areas for the remaining 9% of land requirements (127 ha or 2.0 quarter sections) have not been identified due to the proliferation of constraints in other growth directions.
18. The recommended expansion areas include a small west expansion area within the Town of Stony Plain comprising 0.6 quarter sections (41 ha) of land. Nearly 75% of this northeast expansion area is undevelopable mostly due to the Atim Creek ravine, while the balance is developable for residential and commercial purposes. If acquired, future development on the subject lands will be serviceable by gravity to Spruce Grove's wastewater collection system whereas the wastewater drainage would have to be pumped under Atim Creek in order to discharge into Stony Plain's system.
19. More substantially, the recommended expansion areas also include a south/southeast expansion area within Parkland County comprising 21.8 quarter sections (1,385 ha). The south/southeast expansion area accommodates the vast majority of the City's projected residential, commercial, industrial and public services growth. It represents a logical extension of the City's existing urban footprint on the south side of the CN main line where urban development has already been successfully planned and introduced. This area also facilitates increased alignment of future growth between Spruce Grove and Stony Plain to the west.
20. The south/southeast expansion area facilitates contiguous southward expansion of the City's growing industrial park and the potential for long-term commercial development, which will both help contribute to maintaining the City's current assessment split of 82.5% residential to 17.5% non-residential.
21. The south/southeast expansion area avoids crossing Highway 16 north of the City and the potential consequences associated with a city crossing a highway with fixed crossings and access points.
22. The south/southeast expansion area leverages planned future provincial investments in the upgrading of Highway 628 to the south, better spreading commuter traffic across three commuter corridors to/from Edmonton to the east, while also not crossing Highway 628 and therefore avoiding the potential consequences associated with a city crossing a provincial highway.
23. Urban expansion to the south and southeast can be more easily integrated into the City's existing and planned transportation network and allows for logical extensions of the City's existing water distribution, wastewater collection and stormwater drainage systems.

24. Lands to the northwest of the City of Spruce Grove, between the Town of Stony Plain and Highway 16, are not recommended for future expansion as these lands:
    a. have been identified by Parkland County to accommodate its own growth;
    b. have poor access opportunities due to Atim Creek to the east, Highway 16 to the north and Highway 779 to the west;
    c. are not serviceable by gravity to the City's existing wastewater collection system or the Alberta Capital Region Wastewater Commission's Parkland Trunk; and
    d. are encumbered by a proliferation of watercourses, wetlands and associated natural areas, and include Crown land held for conservation purposes.
25. Lands to the north and northeast of the City of Spruce Grove, across Highway 16, are not recommended for future expansion at this time as these lands:
    a. have been largely identified by Parkland County to accommodate its own growth;
    b. would require crossing Highway 16 and addressing the potential consequences associated with a city crossing a highway;
    c. possess limited integration into the City's existing and planned transportation network as there are only two fixed crossings of Highway 16 at existing interchanges;
    d. would require the establishment of a new water pressure zone for integration into the City's existing water distribution system;
    e. are largely not serviceable by gravity and would require the construction of forcemains and lift stations;
    f. are not previously identified within the Capital Region Growth Plan to accommodate future growth at urban densities; and
    g. are contrary to City policy that states Highway 16 shall remain Spruce Grove's northern limit.
26. Lands to the east of the City of Spruce Grove, between Highways 16 and 16A, are not recommended for future expansion as these lands:
    a. have finite potential to accommodate urban expansion due to the presence of a provincially protected natural area and existing and planned land uses within the Acheson Industrial Area Structure Plan;
    b. could result in eventual urban development adjacent to the Wagner Natural Area to the west, southwest and south; and
    c. have very limited access connection opportunities to efficiently convey traffic to Highways 16, 60 and 16A due numerous barriers such as the Wagner Natural Area, Osborne Acres, existing development patterns in Acheson, the Canadian National (CN) main line, and Highway 16A's curves and grade separated overpass of the CN main line.
27. It is prudent that the City of Spruce Grove proceed with a boundary adjustment in the short-term to obtain sufficient residential, commercial, industrial and public services land supplies to accommodate long-term growth over the next 50 years. This will enable proper planning of land uses and infrastructure investments in an orderly, comprehensive and sustainable manner.
28. Overall, a 50-year annexation is reasonable and appropriate as Spruce Grove is one of the fastest growing communities in Alberta. Access to numerous efficient transportation corridors and proximity to employment within the City itself, the Acheson Industrial Area, and Edmonton and nearby areas within the Capital Region will continue to spur growth for the City.

Appendix A

Wetland Desktop Review for the Spruce Grove Growth Study

ISL Engineering and Land Services

Inspiring sustainable thinking

City of Spruce Grove

Final Report

Wetland Desktop Review for the Spruce Grove Growth Study

December 2016

ISL Engineering and Land Services

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

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MAPS

1.0 Introduction

The City of Spruce Grove and surrounding area currently has a mix of residential, commercial, industrial and agricultural land uses, railway and utility rights-of-way, and wetlands. ISL Engineering and Land Services' Environmental Services team completed a Wetland Desktop Review of wetlands located within Priority Areas of the Study Area to supplement to the Spruce Grove Growth Study. The objectives of the Wetland Desktop Review are to:

- identify and delineate wetlands from historical aerial photographs pursuant to the Wetland Identification and Delineation Directive (Government of Alberta 2015a);
- identify applicable wetland-specific regulatory requirements;
- inform the City of Spruce Grove of wetland assets potentially impacted by future urban expansion, and
- provide environmental planning recommendations for the Project related to conservation, Environmental Reserve, as well as future land use concepts.

1.1 Executive Summary

The Wetland Desktop Review has identified 445 wetlands within the Priority Areas of the Study Area. Most reasonably permanent, large, and/or complex wetlands are anticipated to be Crown claimed. These wetlands are generally recommended for conservation within a plan area due to the potential landscape hydrologic impact and habitat potential, however, less permanent wetlands also perform important wetland functions especially related to stormwater retention.

Most anticipated wetland disturbances associated with development (including stormwater management facilities) will require *Water Act* approval and compensation, while work associated with stormwater management facilities will also require Environmental Protection and Enhancement Act (EPEA) approval. All wetland work and associated regulations require field assessments and reporting conducted by a Wetland Science Practitioner (WSP) pursuant to the Wetland Policy prior to development.

Additional regulatory considerations not included in the scope of this Report but may be applicable to development activities in the Study Area includes the *Migratory Birds Convention Act, Species at Risk Act, Fisheries Act*, *Historical Resource Act,* and *Wildlife Act*.

2.0 Desktop Review

2.1 Wetland Classification in Alberta

Wetlands are areas where the soil is inundated with water at an ephemeral to permanent time scale, such that the soils become reduced (i.e., hydric) and hydrophytic vegetation is dominant. Based on hydrologic, ecological, and soil (e.g., biogeochemical) properties, wetlands can be further grouped and classified. The methodology used to classify wetlands for the Project was based on the Alberta Wetland Classification System (AWCS) (Alberta Environment and Sustainable Resource Development [ESRD] 2015).

Within the AWCS there are five wetland classes divided into forms based on vegetation. Wetland forms are further subdivided into types based on biological, hydrologic, or biogeochemial attributes. Stewart and Kantrud (1971) Classes are comparable to the Water Permanency Type. It should be noted that to determine the full wetland Class, Form, and Type according to the AWCS, field assessment is required. Consequently, this report only reports on wetland Class.

The following provides definitions of each wetland Class (from ESRD 2015). For more information on wetland Classification see the AWCS (ESRD 2015).

Marshes are mineral wetlands with water levels near, at or above the ground surface for variable periods during the year, and which supports graminoid vegetation in the deepest portion of the wetland in the majority of years.

Shallow open water wetlands are mineral wetlands with water levels near, at or above the ground surface of variable periods of the year, which is less than two metres deep at mid-summer and that contains an open water zone in the deepest wetland zone covering greater than 25% of the total area in the majority of years. The open water zone is an expanse of open, mostly unshaded water in marshes and shallow open waters that typically supports submersed, or floating vegetation and is less than two metres deep at mid-summer.

Swamps are mineral wetlands with water levels near, at or above the ground surface for variable periods during the year; and contains either more than 25% tree and/or shrub cover of a variety of species.

Bogs are peatlands fed by ombrogenous waters originating from precipitation with low concentrations of dissolved minerals.

Fens are minerogenous peatlands with surface or subsurface water flow that range from moderately-acidic or basic.

Table 2.1 provides details on the AWCS. The Study Area is expected to contain all five wetland Classes.

Table 2.1: Alberta Wetland Classification System

Class	Form	Type		
		Salinity	Water Permanence[1]	Acidity - Alkalinity
Bog [B]	Wooded coniferous [WC], Shrubby [S], Graminoid [G]	Freshwater [f]	--	Acidic [a]
Fen [F]	Wooded coniferous [WC], Shrubby [S], Graminoid [G]	Freshwater [f]	--	Poor [p]
		Freshwater [f]	--	Moderate-rich [mr]
		Freshwater [f] to slightly brackish [sb]	--	Extreme-rich [er]
Marsh [M]	Graminoid [G]	Freshwater [f] to slightly brackish [sb]	Temporary [II]	--
		Freshwater [f] to moderately brackish [mb]	Seasonal [III]	--
		Freshwater [f] to brackish [b]	Semi-permanent [IV]	--
Shallow Open Water [SOW]	Submersed and/or floating aquatic vegetation [A], bare [B]	Freshwater [f] to moderately brackish [mb]	Seasonal [III]	--
		Freshwater [f] to sub-saline [ss]	Semi-permanent [IV]	--
		Slightly brackish [sb] to sub-saline [ss]	Permanent [V]	--
		Saline [s]	Intermittent [VI]	--
Swamp [S]	Wooded coniferous [Wc] [2], Wooded mixedwood [Wm] [2], Wooded deciduous [Wd] [2], Shrubby [S]	Freshwater [f] to slightly brackish [sb]	Temporary [II]	--
		Freshwater [f] to slightly brackish [sb]	Seasonal [III]	--
		Moderately brackish [mb] to sub-saline [ss]	Seasonal [III]	--

Source: ESRD 2015.
Notes:
1. Roman numerals equivalent to wetland Classes by Stewart and Kantrud (1971).
2. Swamp types are not applicable to wooded swamps due to lack of available information.

2.2 Regulatory Framework

Provincial regulations that are applicable to wetlands in the Study Area are described below.

2.2.1 Provincial

Environmental Protection and Enhancement Act (EPEA)

The EPEA is administered either through Alberta Environment and Parks (AEP) for projects such as land development, or through the Alberta Energy Regulator for oil and gas related activities. The *Act* supports the protection, enhancement and wise use of the environment within a development framework. The EPEA manages air, land, and water. The EPEA and its accompanying regulations set out in detail the activities that require approvals and the requirements for obtaining them. An approval may be required for activities related to stormwater management, waste management, substance release, potable water, pesticides, designated materials, and water wells, as well as for conservation and reclamation.

Public Lands Act

The *Public Lands Act* requires a surface disposition be issued for the use of all public lands in Alberta. The *Act* is responsible for administering lands owned by the Crown. Under Section 3 of the *Act*, public lands include the bed and shore of all permanent and naturally occurring waterbodies, including wetlands, unless the title has been previously granted to a private landowner. The Water Boundary Group for AEP makes a determination of Crown claimed waterbodies under the *Public Lands Act*. All watercourses are assumed to be claimed by the Crown, however, all reasonably permanent wetlands must be submitted to the Water Boundary group for determination of Crown ownership. Currently, the review process for determination of Crown ownership can be from nine months to a year.

Water Act

The *Water Act* manages Alberta's water resources. Through AEP the *Act* governs activities affecting waterbodies in Alberta, including construction, water diversions and infilling of wetlands. *Water Act* approval is required to alter flow of level of water; change the location of water; change the direction of water flow, cause the siltation of water; cause erosion of bed or shore of any waterbody; or any effect on the aquatic environment. With respect to this Wetland Desktop Review, details pertaining to Restricted Activity Periods and fisheries has been omitted.

Within the *Water Act* a number of activities fall under the guidance of Code of Practice (COP) Notifications. *A Code of Practice for Watercourse Crossings* is required for all vehicle and equipment crossings (AEP 2000). Notification must be submitted to AEP at least 14 days prior to construction. For activities within wetlands that do not fall under the guidance of a COP, a *Water Act* approval is required, which may take up to one year to obtain if the Water Boundary Group reviews the Project for Crown ownership (see above). Any *Water Act* approval related to activities within a wetland is also regulated by the Alberta Wetland Policy.

Alberta Wetland Policy

A Wetland Policy for the White Area of Alberta (i.e., the Study Area) was released on June 1, 2015. The Policy does not affect the regulatory process (i.e., wetlands are still regulated under the *Water Act* and *Public Lands Act*), however, it does affect the field assessment methodology and seasonal timing requirements for wetland field assessments.

The goal of the Policy is to conserve, restore, protect and manage Alberta's wetlands through several objectives (Government of Alberta 2013), such as:

- wetlands of the highest value to be protected long-term;
- wetlands, including their benefits and services, are to be conserved and restored in areas where loss has been high;
- wetlands are to be managed by avoiding, minimizing and replacing lost wetland value; and
- wetland management will be considered at a regional context.

Under the authority of the *Water Act*, wetlands must be classified using the AWCS and assigned an ecological wetland value using the Alberta Wetland Rapid Evaluation Tool (AB-WRET). The AB-WRET-Estimate (AB-WRET-E) is provided as a planning tool to estimate the potential value of wetlands, while the AB-WRET-Actual (AB-WRET-A) is the field assessment. The AB-WRET-A must be performed by a WSP to ensure that wetland replacement, when required, considers both specific wetland function and loss of area.

Water Act regulated activities (i.e., those that do not have a COP Notification or exemption) require compensation for wetland loss under the Wetland Policy for all wetlands, except for ephemeral wetlands (i.e., Class I [Stewart and Kantrud 1971]). Ephemeral wetlands have borderline hydric soils and typically lack hydrophytic vegetation. They do not require compensation for *Water Act* regulated activities (i.e., no AB-WRET-A assessment), are regulated under the *Water Act*, and may require a *Water Act* approval, depending on the proposed activity.

When fully implemented, the new Policy will shift compensation payments away from non-profit conservation agencies such as Ducks Unlimited Canada (DUC) and redirect funds back to local areas where actual wetland losses may occur or have historically occurred. Any compensation for wetland disturbance (or loss) will be directed toward agencies at the rural municipality level to assist with its sustainability planning and restoration efforts. The redirection of local compensation funds will be administered by AEP or a municipality and all wetland values will be assessed using the AB-WRET-Actual. This will allow rural municipalities to account for their own respective past, current and future wetland losses and better inform their sustainable development plans. Funds from wetland losses derived from development activities or historic loss in the rural municipality can be integrated into local stewardship and restoration efforts.

Activities identified under a COP of the *Water Act* (e.g., *Code of Practice for Watercourse Crossings*), require a notification but do not require compensation or *Water Act* approval.

3.0 Methodology

3.1 Study Area and Priority Areas

As illustrated in Map A1, the Study Area includes several locations where wetland delineation was prioritized (i.e., Priority Areas). During the course of the wetland delineation exercise, three outcomes from other tasks in the Project resulted in narrowing the delineation of wetlands to Priority Areas within the Study Area. First, the growth strategy options of amalgamation were eliminated in favour of a boundary adjustment strategy, resulting in focus on investigating only undeveloped portions of Stony Plain adjacent to Spruce Grove. Second, future land requirements derived from the population projections did not necessitate investigation of the entirety of Study Area. Third, the analysis of the Study Area from a variety of perspectives concluded that the far northwest and northeast extremities of the Study Area was not necessary, particularly due to municipal servicing constraints, distance from Spruce Grove, and access constraints.

3.2 Wetland Aerial Interpretation

A desktop review was conducted using available information from the Alberta Merged Wetland Inventory (AMWI) (AEP 2013) and recent aerial photography (approximately 2013).

Mandated practice is to use multiple years of historical ortho-rectified aerial photographs and their related precipitation values pursuant to the Wetland Identification and Delineation Directive (Government of Alberta 2015a). However, for this Wetland Desktop Review, only a single year of photography was available and used for wetland delineation and in the estimation of wetland Class.

Wetlands were identified through aerial photograph interpretation using key indicators such as geomorphology and surficial hydrology, as well as vegetation type and cover. For this Wetland Desktop Review, wetlands were classified into wetland Class and assessed for potential to be Crown claimed (i.e., reasonably permanent) and/or for potential Environmental Reserve. Delineated wetland features attempt to identify the transition zone as accurately as feasible.

Additional Classifications are provided below.

Riparian Wetlands

Riparian areas adjacent to streams, creeks and rivers can have the hydrology to support development of hydric soils, and establishment of hydrophytic vegetation. Consequently, these can be considered wetlands as described by the AWCS (ESRD 2015). In this report, any wetland adjacent to or associated with a stream, creek, or water drainage was considered a Riparian wetland, which are typically Marsh Classes.

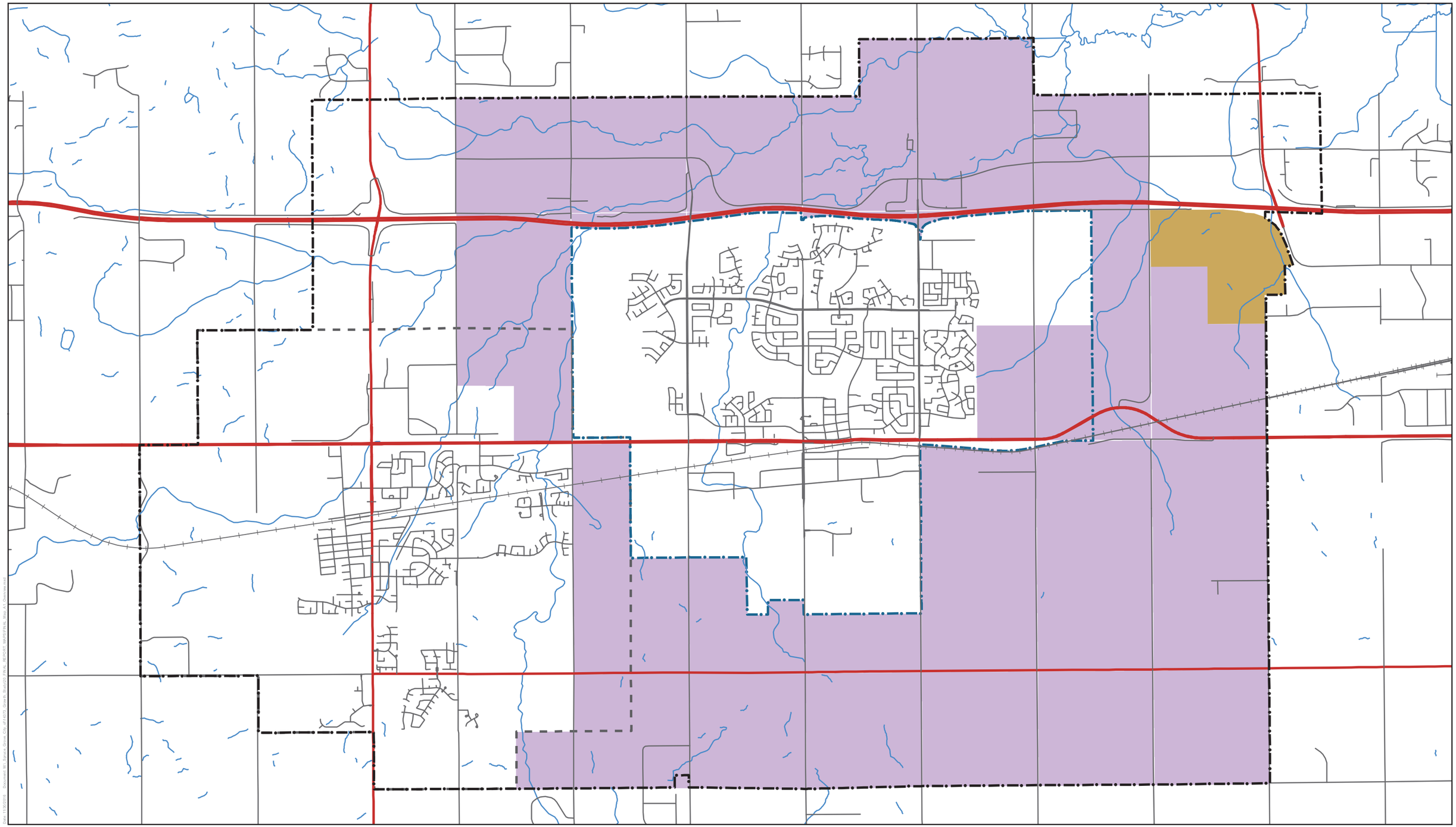
Wetland Complex

Wetlands that contain more than one wetland Class (see Table 2.1) were considered Wetland Complexes for the purposes of this report. The heterogeneous nature of these complexes and generally large sizes make them particularly valuable for habitat and water quality landscape functions.

Artificial Features

Artificial wetland-like features were also delineated during imagery interpretation. These features likely contain surface water and may contain wetland vegetation and hydric soils. However, these features have been anthropogenically created. Dugouts are common artificial features on the cultivated landscape, which

are intended for agricultural use. Artificial wetlands may occur as isolated basins and cutoff from other sources of surficial water (e.g., wetlands, watercourses or drainages), or may occur within the boundaries of natural wetlands as these locations are known sources of water (i.e., to keep the dugout holding water). Artificial features that are associated with natural features were broadly categorized as Artificial for the purposes of this report.



ISL Engineering and Land Services

0 500 1,000 2,000 3,000 metres

- City of Spruce Grove
- Town of Stony Plain
- Wagner Natural Area
- Rail Line
- Regional Road
- Other Road
- Watercourse
- Study Area
- Priority Area

N

1:50,000

The City of Spruce Grove

GROWTH STUDY • MAP A1
STUDY AND PRIORITY AREA OVERVIEW

Date: 11/30/2016 Document M:_Spruce_Grove_City_of\4373_Growth_Study\03_ENG_REPORT_MAP\ENG_Map_A1_Overview.mxd

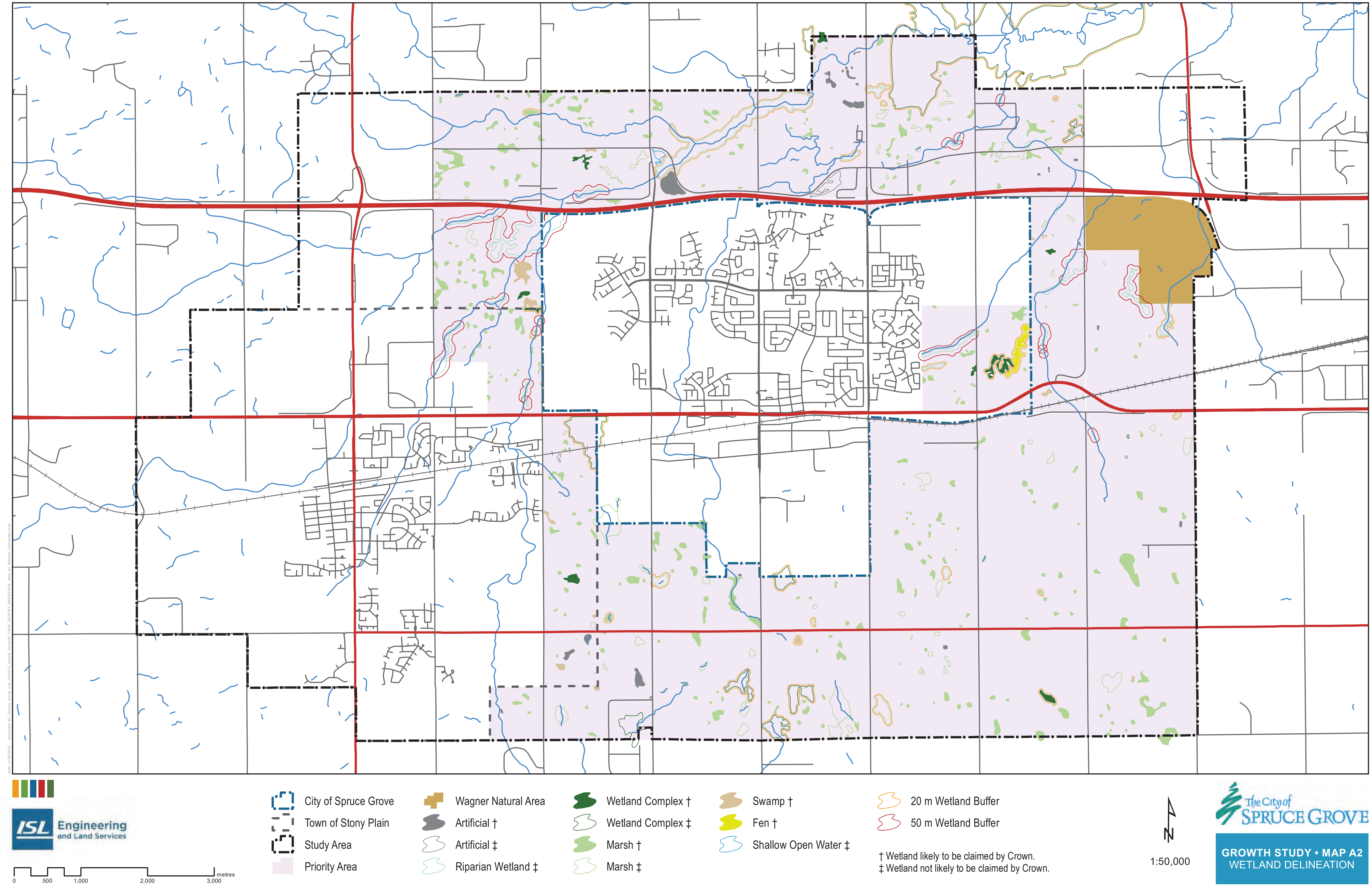
4.0 Results of Aerial Imagery Interpretation

In the Priority Areas, 445 wetland features were identified, delineated, and Classed using the recent aerial imagery (Map A2). Wetlands include: 358 Marshes, one Shallow Open Water wetland, one Fen and 15 Swamps. Twenty-six likely Artificial features were also identified in the Priority Areas. Of the 445 wetland features, 100 may be claimed by the Crown within the Priority Areas (i.e., are likely to be deemed reasonably permanent). Table 4.1 summarizes the results of the desktop aerial interpretation within the Priority Areas. Map A2 illustrates the wetland features delineated within the Priority Areas.

Table 4.1: Desktop Wetland Assessment Results[1]

Wetland Class[1]	Number Likely to be Crown Claimed[2]	Number of Features	Number of Wetlands with Suggested 20 m Environmental Reserve Buffer/Setback[4]	Number of Wetlands with Suggested 50 m Environmental Reserve Buffer/Setback[4]
Artificial[3]	3	26	0	0
Riparian Wetland	23	23	4	17
Wetland Complex	12	21	14	0
Marsh [M]	61	358	11	2
Swamp [S]	0	15	2	0
Fen [F]	0	1	1	0
Shallow Open Water [SOW]	1	1	0	0
Total:	100	445	32	19

Notes:
1. This table is an estimate of wetland numbers and types. Fieldwork by a WSP is required for confirmation.
2. This is an estimate of Crown claimability. Riparian wetlands and watercourses are likely already Crown claimed.
3. Artificial wetlands associated with natural wetlands are not Crown claimable unless they are natural features. Artificial wetlands listed as Crown claimable are features which must be field assessed. If after field studies these wetlands are determined to be man-made they will not be Crown claimable, however they may still require *Water Act* approval for activities within them.
4. See Section 5 for details on wetland setbacks.


City of Spruce Grove
Town of Stony Plain
Study Area
Priority Area
Wagner Natural Area
Artificial †
Artificial ‡
Riparian Wetland ‡
Wetland Complex †
Wetland Complex ‡
Marsh †
Marsh ‡
Swamp †
Fen †
Shallow Open Water ‡
20 m Wetland Buffer
50 m Wetland Buffer
† Wetland likely to be claimed by Crown.
‡ Wetland not likely to be claimed by Crown.
0
500
1,000
2,000
3,000
metres
N
1:50,000
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GROWTH STUDY • MAP A2
WETLAND DELINEATION

5.0 Discussion and Recommendations

5.1 Regulatory Requirements

Most anticipated wetland disturbances associated with development (including stormwater management facilities) will require *Water Act* approval and compensation, while work associated with stormwater management facilities will also require EPEA approval. All wetland work and associated regulations require field assessments and reporting conducted by a WSP pursuant to the Wetland Policy prior to development.

Additional regulatory considerations not included in the scope of this Report but may be applicable to development activities in the Study Area includes the *Migratory Birds Convention Act, Species at Risk Act, Fisheries Act*, *Historical Resource Act,* and *Wildlife Act.*

5.2 Aerial Imagery Interpretation Limitations

Aerial imagery interpretation is an effective way to identify features that are likely wetlands during project planning stages. However, the inconspicuous physical characteristics of some wetlands may have potentially hindered their identification during interpretation due to their small size or often temporary and seasonal occurrence on agricultural land. Additionally, Swamp wetlands are particularly difficult to differentiate from wet forest during imagery interpretation. Due to the limitations of imagery interpretation, the wetland location, size, and Class should be used as a guideline for planning purposes only. All work impacting wetland area and function require field assessments and reporting conducted by a WSP pursuant to the Wetland Policy prior to development.

5.3 Wetland Conservation and Protection

Generally, ISL recommends retention of reasonably permanent, large, and/or complex wetlands due to the potential landscape hydrologic impact. Typically, these basins have limited anthropogenic disturbance resulting in native plant communities, high potential for rare species, and stable wildlife habitat for waterfowl, shorebirds, amphibians, and invertebrate species. Additionally, these basins typically hold more water than other wetlands and may be significant to catchment hydrology. To infill them during development would not only displace this water, but also likely impact the overland flow dynamics, which could lead to flooding and/or spring melt and stormwater management issues.

It should also be noted that less permanent wetlands also provide important wetland functions such as stormwater retention, sediment and nutrient retention, as well as wildlife habitat, however, they occur as smaller features on the landscape within the Study Area and the impact of their disturbance is anticipated to be less since the majority of them have been historically disturbed by cultivation. ISL recommends that during development, conservation of these wetlands be considered on a site-specific basis.

With respect to stormwater management facilities, ISL recommends that these facilities be associated with naturally occurring wetlands and mimic natural wetlands to allow for creation of wetland-like habitat.

5.3.1 Setbacks and Environmental Reserve

Wetland setbacks are important to consider for development planning. Setbacks provide a buffer of vegetation and help to filter water and other inputs, provide habitat for wildlife, and help protect the wetland from disturbance. For wetlands there is no official setback either provincially or in Parkland County. The Parkland County Environmental Conservation Master Plan (ECMP) suggests that additional environmental assessments are required to support proposed developments within 100 m of wetlands, lakes and

environmentally sensitive areas associated with lakes (Parkland County 2014). The ECMP also states that development should maintain or restore natural drainage patterns (Parkland County 2014).

The Alberta government recommends 20 m for glacial till or 50 m for coarse textured sands and gravels adjacent to Class III (Stewart and Kantrud 1971) and above wetlands as well as lakes, rivers, streams, seeps and springs (Government of Alberta 2012). Class II wetlands (Stewart and Kantrud 1971) have a recommended 10 m setback (Government of Alberta 2012).

Wetland delineations for this Wetland Desktop Review did not include a development setback. Wetland features (including Riparian wetlands) that were identified as potentially high functioning based on interpretation of surficial hydrology, vegetation cover, and surrounding land use, were assigned a setback distance based on the above Government of Alberta (2012) recommendations.

ISL recommends that most wetlands associated with watercourses (i.e., Riparian wetlands) be claimed as Environmental Reserve and have a 50 m setback applied. A 20 m setback is recommended for some wetlands and riparian areas that have low disturbance and/or high potential for habitat. Table 4.1 and Map A2 summarizes the number of wetlands of each Class (identified by aerial interpretation) and the suggested buffers.

6.0 References

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Appendix B

Land Requirements Approach

Appendix B Land Requirements Approach

B.1 Preliminary Residential Land Requirements

The approach to calculate the residential land requirements presented in Table 19 of the Growth Study involved the following:

1. Of the total estimated population change between 2015 and 2067, 95% of the population was assumed to be accommodated on unabsorbed residential lands. The remaining 5% (see Growth Study Section 6.1) was assumed to be accommodated through residential intensification.
2. An estimate of the dwelling requirements for this 95% of the calculated population change was determined using the 2067 average household size assumption of 2.67 persons per occupied dwelling (see Growth Study Section 6.2).
3. Net residential land requirements were then calculated based on the split residential density assumptions of 28.3 du/nrha for the remaining unabsorbed residential land supply within the City and 35 du/nrha for residential land beyond the City (see Growth Study Section 6.3).
4. Net residential land requirements were then extrapolated upward to accommodate associated net developable overheads (i.e., parks and open space, public utilities and circulation). The net developed overheads were assumed to be 37% of gross residential land requirements (see Growth Study Section 6.4). Therefore, net residential land requirements represent 63% of gross residential land requirements.
5. An additional 10% was applied to the gross residential land requirements to accommodate the recommended market allowance.

As a result of the above methodology the land requirements model generated a gross residential land requirement of 1,360 ha, consisting of 857 ha of net residential land requirements and 503 ha of net developable overheads. After accounting for an additional 136 ha for the residential market allowance, the land requirements model generated a **preliminary** total gross land requirement of 1,496 ha. This figure provides the necessary flexibility to accommodate the City's estimated demand for residential land under the recommended Medium-High Case Scenario. This requirement **does not**, however, factor any land requirements for public services, which are often located within residential areas. See Section B.3 below for the **final** total gross residential land requirement.

B.2 Public Services Land Requirements

Table 13 of the Growth Study provides a summary of the net absorbed lands within the City of Spruce Grove. The land supply analysis identified an inventory of 97.2 ha of net absorbed lands for public services compared to 615.4 ha of net absorbed lands for residential purposes within the City. This results in a 15.8% ratio of net public services lands to net residential lands, or 15.8 ha of net public services lands for every 100 ha of net residential lands. The Growth Study assumes this ratio carries forward through to 2067 as there is generally a direct relationship between population (residential land need) and public services to support the population (public services land need). The approach to calculate the public services land requirements presented in Table 19 of the Growth Study therefore involved the following:

1. The current 15.8% ratio of net public services lands to net residential lands was applied to the 857 ha of net residential land requirements identified in Section B.1 above.
2. Net public services land requirements were then extrapolated upward to accommodate associated net developable overheads (i.e., parks and open space, public utilities and circulation). The net developed overheads were assumed to be 37% of gross residential land requirements (see Section 6.4). Therefore, net public services land requirements represent 63% of gross public services land requirements.

As a result of the above methodology the land requirements model generated a gross public service land requirement of 215 ha, consisting of 135 ha of net public services land and 80 ha of net developable overheads under the recommended Medium-High Case Scenario. It was then assumed that 75% of the

gross public services land requirements (161 ha) would be located within future residential areas while 25% (54 ha) would be located within industrial areas.

B.3 Final Residential Land Requirements

Based on the public services allocation assumptions presented in Section B.2 above, the final total gross land area required to provide the necessary flexibility to accommodate the City's estimated demand for residential plus 75% of the estimated requirement for associated public services under the recommended Medium-High Case Scenario is 1,657 ha.

B.4 Commercial Land Requirements

The land supply analysis within Table 13 of the Growth Study identified an inventory of 101.6 ha of net absorbed commercial lands compared to 615.4 ha of net absorbed residential lands within the City. This results in a 16.5% ratio of net commercial lands to net residential lands, or 16.5 ha of net commercial lands for every 100 ha of net residential lands. The Growth Study assumes this ratio carries forward through to 2067 as there is generally a direct relationship between population (residential land need) and commercial services to support the population (commercial land need). The approach to calculate the commercial land requirements presented in Table 19 of the Growth Study therefore involved the following:

1. The current 16.5% ratio of net commercial lands to net residential lands was applied to the 857 ha of net residential land requirements identified in Section B.1 above.
2. Net commercial land requirements were then extrapolated upward to accommodate associated net developable overheads (i.e., parks and open space, public utilities and circulation). The net developed overheads were assumed to be 37% of gross residential land requirements (see Section 6.4). Therefore, net commercial land requirements represent 63% of gross commercial land requirements.
3. An additional 10% was applied to the gross commercial land requirements to accommodate the recommended market allowance.

As a result of the above methodology the land requirements model generated a gross commercial requirement of 225 ha, consisting of 142 ha of net commercial land and 83 ha of net developable overheads. After adding 22 ha to accommodate the commercial market allowance, the land requirements model generated a total gross commercial land requirement of 247 ha to provide the necessary flexibility to accommodate the City's estimated demand for commercial land under the recommended Medium-High Case Scenario.

B.5 Industrial Land Requirements

The land supply analysis within Table 13 of the Growth Study identified an inventory of 239.5 ha of net absorbed industrial lands compared to 615.4 ha of net absorbed residential lands within the City. This results in a 38.9% ratio of net industrial lands to net residential lands, or 38.9 ha of net industrial lands for every 100 ha of net residential lands. The Growth Study assumes this relationship carries forward through to 2067 in accordance with its guiding growth principles to align with the City' Strategic Plan, to maintain a stable economic base, and provide a sustainable mix of land uses for residents to work and invest in their community. The assumption of this relationship may also afford the City the opportunity to maintain the City's 2016 municipal assessment split of 82.5% residential to 17.5% non-residential. The approach to calculate the industrial land requirements presented in Table 19 of the Growth Study therefore involved the following:

1. The current 38.9% ratio of net industrial lands to net residential lands was applied to the 857 ha of net residential land requirements identified in Section B.1 above.
2. Net industrial land requirements were then extrapolated upward to accommodate associated net developable overheads (i.e., parks and open space, public utilities and circulation). The net developed

overheads were assumed to be 37% of gross industrial land requirements (see Section 6.4). Therefore, net industrial land requirements represent 63% of gross industrial land requirements.

3. An additional 10% was applied to the gross industrial land requirements to accommodate the recommended market allowance.

As a result of the above methodology the land requirements model generated a gross industrial requirement of 529 ha, consisting of 333 ha of net industrial land and 196 ha of net developable overheads. After adding 53 ha to accommodate the industrial market allowance, the land requirements model generated a **preliminary** total gross industrial land requirement of 582 ha to provide the flexibility to accommodate the City's estimated demand for industrial land under the recommended Medium-High Case Scenario. This requirement is **before** factoring the remaining land requirements for public services, which is assumed to be located within industrial areas. Based on the public services allocation assumption of 25% presented in Section B.2 above, the **final** total gross industrial land requirement under the recommended Medium-High Case Scenario is 636 ha.