Edmonton Energy and Technology Park

Area Structure Plan
December 2009

Office Consolidation January 2015

Urban Systems
Golder Associates
PAAE Ltd.
Gray Scott Group Inc.
ISL Engineering

Edmonton Energy and Technology Park Area Structure Plan

Office Consolidation Jan 2015

Prepared by:

Current Planning Branch

Sustainable Development

City of Edmonton

Bylaw 15093 was adopted by Council in June 2010. In January 2015, this document was consolidated by virtue of the incorporation of the following bylaws, which were amendments to the original Bylaw 15093

Bylaw 15093	Approved June 9, 2010 (To adopt the Horsehills Energy and Technology Park Area Structure Plan)
Bylaw 15642	Approved May 2, 2011 (To rename the ASP to Edmonton Energy and Technology Park ASP, identify a park site in the park area, delineate the City's Legal Entitlement to Municipal Reserve in Section 7.7 and update the Land Use Statistics Table)
Bylaw 16175	Approved January 23, 2013 (To amend the Edmonton Energy and Technology Park Area Structure Plan to amend the boundaries of the Plan and to incorporate administrative amendments that were approved as a part of Bylaw 16169 to rezone the subject lands)
Bylaw 16767	Approved September 23, 2014 (To allow for the development of a wider range of industrial production facilities in the Edmonton Energy and Technology Park ASP and to update contextual information.)

Editor's Note:

This is an office consolidation edition for the Edmonton Energy and Technology Park Area Structure Plan, as approved by City Council on June 9, 2010. For the sake of clarity a standardized format was utilized in this Plan. Private owner's names have been removed in accordance with the Freedom of Information and Protection of Privacy Act. All text changes are noted in the right margin and are italicized where applicable. Furthermore, all reasonable attempts were made to accurately reflect the original Bylaw.

This office consolidation is intended for convenience only. In case of uncertainty, the reader is advised to consult the original Bylaws, available at the Office of the City Clerk.

City of Edmonton

TABLE OF CONTENTS

Executive Summary		**4**
1.0	**Introduction**	**6**
1.1	Regional Context	6
1.2	Economic Growth Projections	8
1.3	Project Description	8
2.0	**Eco-Industrial**	**9**
3.0	**Site Conditions**	**12**
3.1	Site Context	12
3.2	Biological Environment	13
3.3	Physical Environment	14
3.4	Social Environment	17
3.5	Existing Infrastructure	20
4.0	**Public Involvement**	**23**
4.1	June 2008 Information Session	23
4.2	Key Stakeholder Meetings	24
4.3	October 2008 Public Meeting	25
4.4	October 2009 Public Meeting	27
5.0	**Policy context**	**28**
5.1	Capital Region Board	28
5.2	CR Integrated GrowthPlan	28
5.3	The Way Ahead and MDP	29
5.4	Sturgeon County MDP	32
5.5	City of Fort Saskatchewan MDP	32
5.6	The Way We Move	33
5.7	Alberta's Industrial Heartland	33
5.8	Industrial Land Strategy	34
5.9	Smart Choices	34
5.10	NSRV Area Redevelopment Plan	35
5.11	Zoning Bylaw	35
5.12	Risk Management Policy	35
5.13	Natural Areas Policies	37
5.14	Historic Resources	37
6.0	**Guiding Principles**	**379**
6.1	Sustainable Development	38
6.2	Industrial Ecology and Efficiency	38
6.3	Effective Transportation	39
6.4	Land Use Compatibility	39
6.5	Innovative Infrastructure	39
6.6	Environmental Protection	40
6.7	Effective Implementation	40
7.0	**Development Concept**	**41**
7.1	Land Use Precincts	41
7.2	Petrochemical Cluster Precinct	43
7.3	Logistics Precinct	45
7.4	Manufacturing Precinct	46
7.5	R & D Park Precinct	47

7.6	Natural Area Integration	49
7.7	Open Spaces and Parks	54
7.8	Risk Management Strategy	56
7.9	Existing Residential	57
8.0	**Transportation**	**58**
8.1	Regional Road Network	58
8.2	Arterial Road Network	59
8.3	Collector Road Network	61
8.4	Alternative Road Cross-sections	61
8.5	Pedestrian/Bicycle Network	64
8.6	LRT and Transit Network	67
8.7	Heavy Rail	69
8.8	Pipeline Systems	69
9.0	**Infrastructure and Servicing**	**71**
9.1	Water Servicing	71
9.2	Stormwater Servicing	74
9.3	Wastewater Servicing	77
9.4	Energy	80
9.5	Shallow Utilities	82
9.6	Communal Piping System	82
10.0	**Design Guidelines**	**83**
10.1	Sustainable Development	84
10.2	Industrial Efficiency and Ecology	85
10.3	Effective Transportation	86
10.4	Land Use Compatibility	88
10.5	Innovative Infrastructure	88
10.6	Environmental Protection	91
10.7	Effective Implementation	92
11.0	**Implementation**	**93**
11.1	General Staging	93
11.2	Technical Report Requirements	95
11.3	Planning / Engineering Studies	96
11.4	Public Consultation Requirements	98
11.5	Monitoring	98
	Statistics	**100**
12.0	**References**	**102**

TABLE OF FIGURES

Figure 1:	The Capital Region	8
Figure 2:	Edmonton Context	13
Figure 3:	Horsehills Area Topography	17
Figure 4:	Existing Zoning	20
Figure 5:	Existing Pipelines and Well Locations	21
Figure 6:	Existing Roadways	23
Figure 7:	Municipal Development Plan	31
Figure 8:	Development Concept	42
Figure 9:	Petrochemical Cluster Precinct	43
Figure 10:	Logistics Precinct	45
Figure 11:	Manufacturing Precinct	46
Figure 12:	Research and Development Precinct	47
Figure 13:	Ecological Features	53
Figure 14:	Open Spaces and Parks	55
Figure 15:	Road Network	62
Figure 16:	Pedestrian and Bicycle Network	65
Figure 17:	LRT and Rail Network	67
Figure 18:	Water Network	72
Figure 19:	Stormwater Management Network	75
Figure 20:	Wastewater Servicing Network	78
Figure 21:	Potential Power Substations	80
Figure 22:	Development Staging	93
Figure 23:	Technical Report Sub-Areas	98

LIST OF ABBREVIATIONS

ACRWC Alberta Capital Region Wastewater Commission
AIH Alberta's Industrial Heartland
AESO Alberta Electrical System Operator
ARP Area Redevelopment Plan
ASP Area Structure Plan
CFB Canadian Forces Base Edmonton
CN Canadian National Railway
CRNWSC Capital Region Northeast Water Service Commission
ERRR Edmonton Regional Ring Road
ILS Industrial Land Strategy
LRT Light Rapid Transit
MDP Municipal Development Plan
MGB Municipal Government Board
MIACC Major Industrial Accidents Council of Canada
NSRV North Saskatchewan River Valley
TMP Transportation Master Plan
TOD Transit Oriented Design
TUC Transportation and Utility Corridor
UPMP Urban Parks Master Plan

LIST OF APPENDICES

Appendix 1: June 18th Public Information Session

Appendix 2: October 1st Public Meeting

EXECUTIVE SUMMARY

(Bylaw 16767 Sept 23, 2014)

The Province of Alberta has experienced unprecedented levels of economic activity in the exploration and extraction of oil and gas reserves. The value-added production of petrochemical products from these energy resources is immense and offers the potential for significant sector growth in Alberta.

In this context, the City of Edmonton in early 2008 authorized the preparation of this document, the Edmonton Energy and Technology Park Area Structure Plan (ASP). This document is a statutory land use plan that provides a framework to encourage the development of these ancillary petrochemical industries in Northeast Edmonton, comprising approximately 4,800 ha (12,000 acres).

R*ecent changes in the global economic situation resulted in several industry participants re-evaluating individual corporate pace of growth and commitment to expansion. While short-term reduction in activity has taken place, the long-term expectations of growth within the industry and the Canadian economy remain in place. Together with the reasonable certainty of a significant economic upturn in the future, the opportunity to put in place an action plan for increased participation should be pursued. It is expected that in addition to growth in bitumen related industry, natural gas derivatives will greatly increase development and investment opportunities.*

(Bylaw 16767 Sept 23, 2014)

In addition to providing land designated for a specific type of industrial growth, the Edmonton Energy and Technology Park ASP intends to chart a course for the development of the ASP area into a world class eco-industrial precinct that combines economic opportunity, ecological integrity, and efficient use of land and resources through the application of Eco-Industrial Development. Eco-Industrial Development has been used as the basis for industrial projects worldwide and is gaining popularity in North America.

The land uses within the plan area have been developed to function as an integrated cluster of chemical based industries that work together to refine chemicals into market products. The primary land uses include a petrochemical cluster precinct that will use feedstocks from the area, a manufacturing precinct that will use the refined chemicals to create goods, a logistics precinct that packages and moves goods, and a research and development precinct that supports the technical needs and business functions of the cluster.

(Bylaw 16767 Sept 23, 2014)

This plan also provides an integrated natural areas system that protects and augments the ecological function of the existing natural landscape. This will be achieved through a series of active parks incorporated for employee use, together with a walking and cycling network to support recreational use and alternative transportation methods. Sustainable development practices are encouraged through the plan's design guidelines and permissive policies encouraging the development of alternative infrastructure solutions.

1.0 INTRODUCTION

1.1 Regional Context

Alberta Economic activity in the petrochemical sector is driven by the exploration and extraction of oil and gas reserves. Edmonton and surrounding area, known as the Capital Region (shown in Figure 1), acts as the service centre for oil and gas activity in northern Alberta. The Capital Region provides these industries supportive services such as logistics, manufacturing, and office functions.

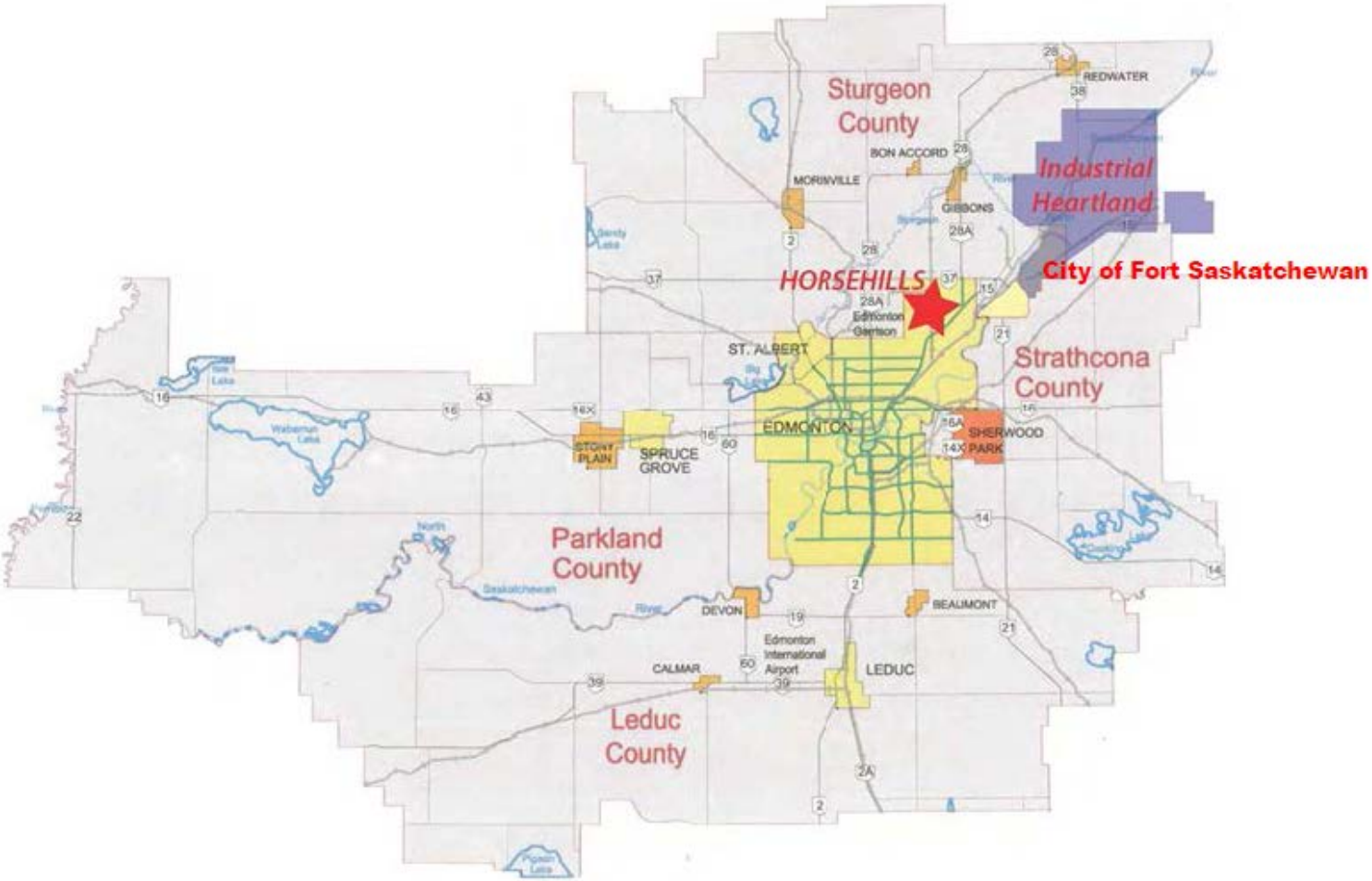
(Bylaw 16767 Sept 23, 2014)

This relationship between the oil and gas industry and the Capital Region has also been strengthened with the creation of Alberta's Industrial Heartland (AIH). AIH consists of over 580 square kilometres of land designated for heavy industrial uses that straddles portions of Edmonton, Strathcona County, Sturgeon County, Lamont County, and the City of Fort Saskatchewan. These municipalities have worked together to create complementary Area Structure Plans to designate AIH as the best suited area for heavy industrial development in the Capital Region. AIH provides heavy industry the benefits of co-location, including sharing common products and developing common supportive industries between multiple companies. The area currently houses over 30 chemical businesses representing more than $11 billion in investment, including internationally recognized companies like DOW Chemical, Shell, Imperial Oil. BP Amoco, Sherritt International, Praxair, and Petro-Canada. This agglomeration has made the AIH Canada's largest hydrocarbon processing region. The AIH has an association, the Alberta's Industrial Heartland Association (AIHA), that actively plans and promotes opportunities within the AIH. Future development in AIH will provide significant long term opportunities for supportive industrial development in the Capital Region. It is anticipated that this ancillary industrial growth could represent more than fifty years of future development potential.

Future development in AIH will provide significant long term opportunities for supportive industrial development in the Capital Region. It is anticipated that this ancillary industrial growth could represent more than fifty years of future development potential.

Northeast Edmonton is well suited to take advantage of these opportunities, because of its location both near the development within AIH and the existing municipal services provided by the City of Edmonton.

Figure 1: The Capital Region



1.2 Economic Growth Projections

(paragraph deleted Bylaw 16767 Sept 23, 2014)

Edmonton area has superior access to feedstocks, along with cost advantages and good access to skilled staff compared to other global city regions. This makes the Edmonton area a good location to develop chemical industries dependant on feedstocks. This opportunity will be most successful if factors including costs, infrastructure availability, shared services, convenient transportation of goods, availability of skilled workers, and availability of feedstocks are considered through the development planning process.

1.3 Project Description

It is in this context that the City of Edmonton authorized the preparation of the Edmonton Energy and Technology Park Area Structure Plan (ASP). This ASP will describe a specific industrial development opportunity for Northeast Edmonton. An ASP is a long term statutory land use planning document approved by City Council by Bylaw. It is intended to provide a framework of policy and regulation to direct development with that identified area.

(Bylaw 16767 Sept 23, 2014)

It is the intention of the Edmonton Energy and Technology Park ASP to chart a course for the development of the Northeast area into a world class eco-industrial precinct specializing in petro-chemical manufacturing industry. The Edmonton Energy and Technology Park ASP will create an ordered pattern of development that integrates industry, nature, and people in a way that creates a whole that is better than the sum of its parts.

2.0 ECO-INDUSTRIAL

The Edmonton Energy and Technology Park ASP will provide a vision for a new kind of industrial area for the City of Edmonton. The Plan allows for the economic opportunities identified in the Kline studies. Environmental considerations are also becoming increasingly important in public opinion, business functions, and corporate social responsibility. Edmonton Energy and Technology Park provides an opportunity to blend both economics and environment into the planning process.

Businesses know that maximizing efficiency is good for the bottom line. Development that maximizes utility and minimizes waste can also be good for the environment. This is the fundamental principle behind the development of a new industrial movement called Eco-Industrial Development. Eco-Industrial Development intends to maximize the efficiency of industrial production, individual businesses, and entire business park areas while considering ways in which these efficiencies can best achieve *"environmentally sustainable industry within an environmentally sustainable community"*.

An Eco-Industrial project is intended to balance economic, environmental, and social interests in a way that maximizes the benefit for each of these factors. This balanced philosophy is referred to as the 'triple bottom line'.

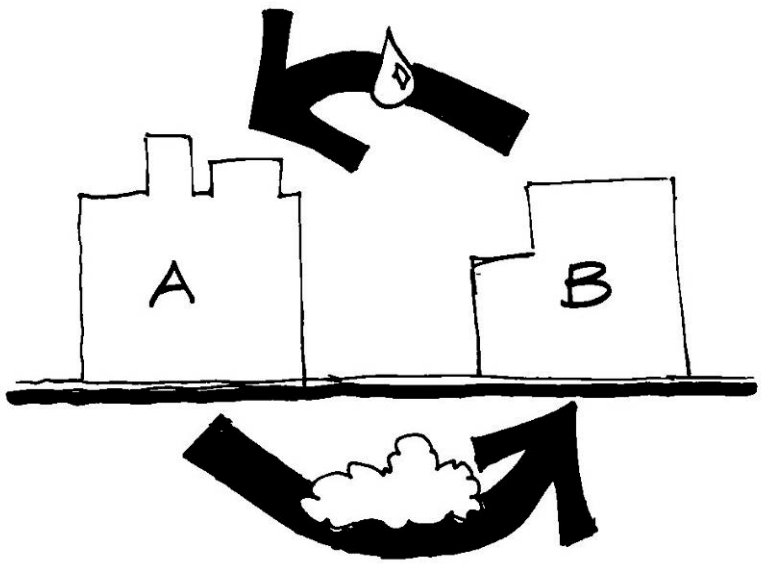
Eco-Industrial developments share the following characteristics:

- Businesses achieve improvements in productivity of human and natural resources
- Energy is used widely and generated locally
- Fewer non-biodegradable wastes are introduced into the environment
- Businesses connect to their communities and are compatible with mixed land uses
- Inter-company networks bring about new efficiencies and new market opportunities
- Sustainable land use and sustainable design of facilities are the norm

(Bylaw 16767 Sept 23, 2014)

- *There is the opportunity for businesses located in the park to share waste heat*

A myriad of practices are used to implement these eco-industrial characteristics. Eco-industrial developments may create networks of businesses to share common services like loading yards and parking facilities, or even share waste outputs that can be used as process inputs for another business.



Alternative infrastructure may be used to improve environmental performance while reducing costs. This may include developing alternative roadway standards that reduce impermeable surfaces and paving costs, creating naturalized stormwater management facilities that improve groundwater recharge and reduce pipe costs, using recycled wastewater from nearby treatment facilities, or storing rainwater to use instead of treated water for industrial process or for yard maintenance. Local service provision is also common in eco-industrial developments, whether that be an area-specific recycling facility, local wastewater treatment plant, or even a co-generation power facility. These are just some examples of the many ways eco-industrial development is implemented.

Eco-Industrial Development has been used as the basis for industrial projects around the world and is gaining popularity in North America. Canadian examples of the application of Eco-Industrial principles include the Maplewood Project in Vancouver, the Burnside Eco-Industrial Park in Halifax, the Innovista Eco-Industrial Park in Hinton, and Taiga Nova in Fort McMurray.

The balance between economic, environmental and social

interests, along with Eco-Industrial Development's proven success in a myriad of applications both locally and worldwide, makes it an ideal model to use as the basis of development in Edmonton Energy and Technology Park. The plan area does not have extensive existing infrastructure. That allows maximum opportunity to pursue eco-industrial development in the development of sites and major infrastructure.

Development policies and design requirements that respect eco-industrial principles will be incorporated throughout the plan to ensure that eco-industrial objectives become a cornerstone of development in Edmonton Energy and Technology Park.

3.0 SITE CONDITIONS

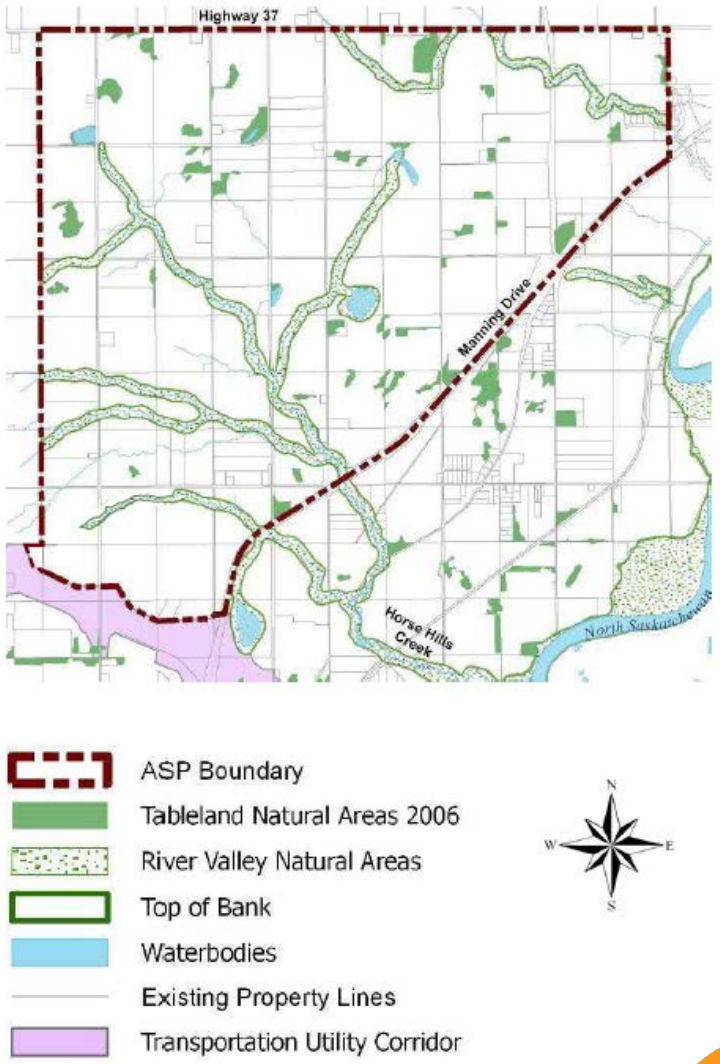
3.1 Site Context

(Bylaw 16767 Sept 23, 2014)

Edmonton Energy and Technology Park is located in northeast Edmonton. It accounts for most of the remaining undeveloped land within the City of Edmonton. The plan area is bounded by the Transportation / Utility Corridor (TUC) to the south, Manning Drive and the City Limits to the east, the City Limits to the north, and the eastern boundary of the Edmonton Canadian Forces Base (CFB) Edmonton to the west, as shown in Figure 2.

In order to understand the existing conditions and determine the best way to integrate them with planned development, the Edmonton Energy and Technology Park Area Ecological Network Analysis was prepared. The following sections provide a summary of the existing conditions. Supporting studies should be consulted for detailed information and mapping.

Figure 2: Edmonton Context (Bylaw 16175 Jan 23, 2013)



3.2 Biological Environment

Biological Environment

The Study Area lies entirely within the Central Parkland Subregion and is characterized by undulating terrain that is predominantly comprised of till plains and hummocky uplands. Most of the area has been cultivated or developed, leaving remnant patches of native parkland, characterized by a mosaic of aspen and grassland vegetation, or mixedwood forests of aspen and white spruce along the North Saskatchewan River system and tributaries.

The main natural feature of the study area is the Horsehills Creek, which is part of the North Saskatchewan River Valley (NSRV) system. Horsehills Creek was identified as one of the most modified ravines within the City of Edmonton by a study undertaken by Wood and Tomiyama in 2006. Horsehills Creek is *"an ephemeral stream that flows during the spring snow melt and then almost completely dries up from early to mid summer. As a result of this low summer flow, agricultural activity frequently reaches to the stream borders and even extends across the creek bed in the upper portions of the creek."* There are natural and man-made depressions along the stream course that contain water throughout the summer, and beaver activity is common.

Natural Communities

In addition to Horsehills Creek, there are several forest patches and wetlands. Many of these areas have been classified as areas of environmental significance by previous studies undertaken for the City of Edmonton, including the Inventory of Environmentally Sensitive and Significant Areas undertaken by Geowest in 1993. These natural areas provide valuable habitat and refuge for many plant and wildlife species and often act as connecting corridors for movement of species into the broader North Saskatchewan River Valley System.

Many of the species found in the Edmonton Energy and Technology Park are common to the City of Edmonton.

A few of the species that may potentially be found within the general area are protected as provincially and federally-listed species. These include the Peregrine Falcon, Harriot's sagewort, and the Northern leopard frog. However, it is unlikely that any of them would nest or den in the study area in great abundance due to the cultivated and developed nature of the area. Remaining likely habitat for these species include areas that will be protected, such as the North Saskatchewan river valley, other riparian corridors, and significant wetlands. Additional site specific assessments are also recommended to identify appropriate protection measures prior to development.

3.3 Physical Environment

Soils and Bedrock

Area soils generally consist of preglacial fluvial sediments overlying bedrock. The surficial deposits in the vicinity of the site range from less than 10 metres to 50+ metres. thick. Thicker deposits correspond to the Beverly Valley and the Horsehills Creek lows. Preglacial sands and gravels are also found in these lows.

The uppermost bedrock unit consists of the Edmonton Group Horseshoe Canyon Formation, which overlies the Bearpaw Formation and the Belly River Group. The topography of the bedrock regionally slopes towards one of the two predominant preglacial valleys (bedrock lows) in the area. Locally, the top of the bedrock structure generally slopes towards the Horsehills Creek and North Saskatchewan River. The bedrock surface varies from 590 to 650 metres above sea level.

Topography and Drainage

The area is generally flat with isolated low hills, depressions, shallow creek and drainage courses as shown in Figure 3. The majority of surface water and shallow groundwater flow easterly to the North Saskatchewan River from these creeks and drainage courses. Surface drainage consists of three main basins, all of which drain to the North Saskatchewan River.

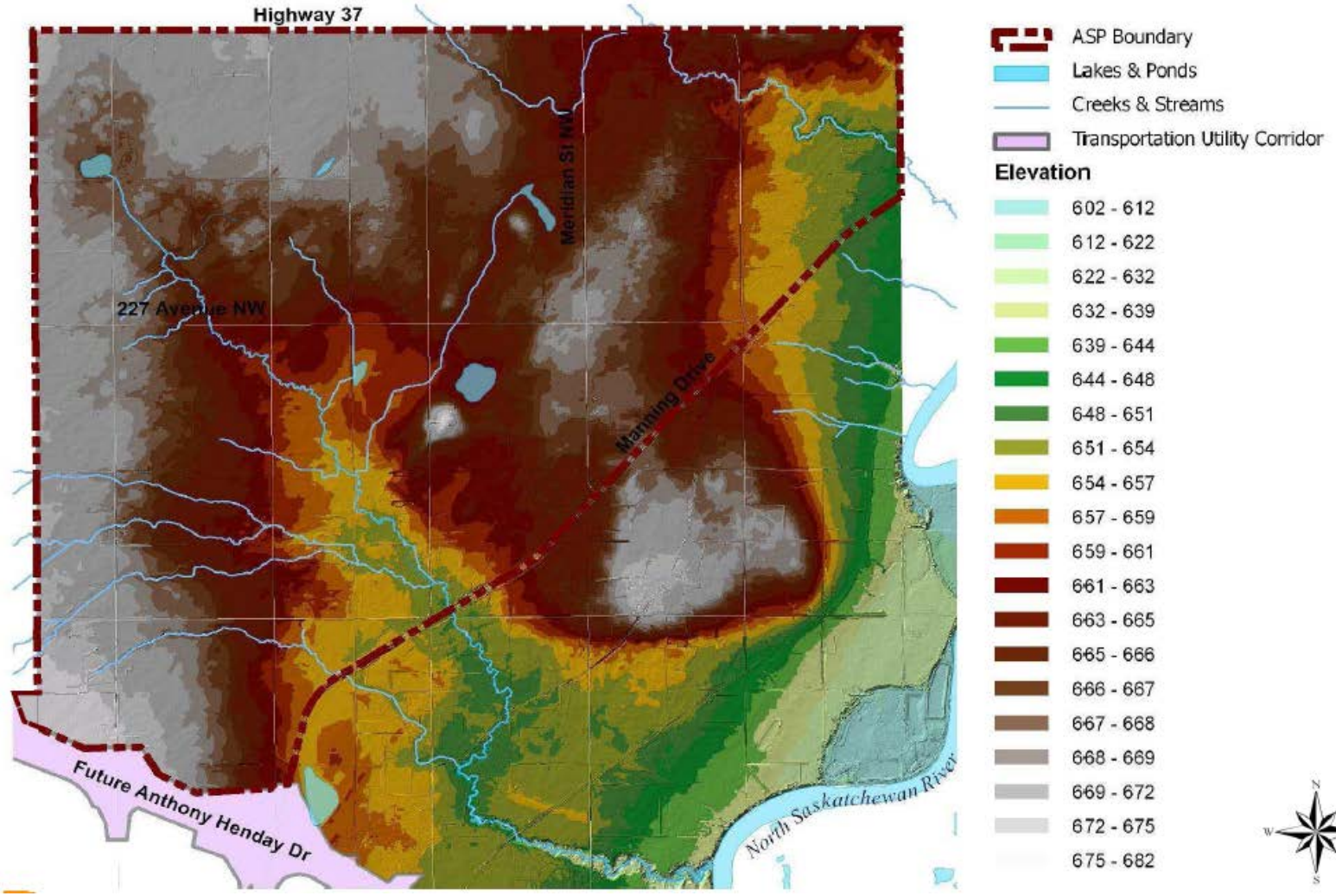
Deeper groundwater flows towards the various creeks and bedrock lows of the area. Flows vary depending on the aquifer type. Their flows vary from less that 5 l/min in

shallow sands to over 400 l/min in bedrock wells over 250 metres. Wells in this formation are likely saline in nature.

Potential Contamination

Several areas may have soil or groundwater concerns, including a federal prison, existing pipeline right-of-ways, historical salt water areas, natural gas and condensate release areas, rail lines, abandoned oil and gas wells, unidentified industrial/commercial properties, unidentified structures and an area of historical ground disturbance. Additional investigations are required to confirm the presence of contamination.

Figure 1: Horsehills Area Topography (Bylaw 16175 Jan 23, 2013)



3.4 Social Environment

Historical Land Use

The Horse Hills are so named because the location was the home of Fort Edmonton's horse guard (Blue 1924) and where as many as 800 horses were housed. The area was bisected by a portion of the Victoria Trail, an important overland route between Fort Edmonton, the Victoria Metis Settlement and areas to the East. The trail roughly follows Old Fort Road and is believed to predate the arrival of Europeans to the area, having been used as main east west travel route in pre-contact times.

Horse Hills played an important role in the maintenance and protection of Fort Edmonton. Review of historic resources did not identify any previously recorded pre-contact archaeological sites but did indicate there are 25 recorded historic structures. Areas surrounding watercourses also have the potential for archaeological resources.

Area names are largely based on this historical use. Residents typically refer to the area as Horse Hills, but the school south of Manning is called Horse Hill Elementary and Junior High School. *(sentence deleted Bylaw 16767 Sept 23, 2014)*

Land Use Context

Edmonton Energy and Technology Park is immediately south of the boundary of Sturgeon County. The Sturgeon County lands near the plan area are used largely as farmland. Sturgeon County has been committed by the Municipal Government Board to develop an Area Structure Plan for the area north of Edmonton Energy and Technology Park to determine future land uses. This project has not yet been initiated.

Strathcona County and the City of Fort Saskatchewan are located across from Edmonton Energy and Technology Park along the eastern boundary of the North Saskatchewan River. The closest lands to Edmonton Energy and Technology Park within Strathcona County are currently agricultural. Strathcona County's recently updated Municipal Development Plan has designated these lands for both continued agricultural uses and also

'transitional urban reserve' uses. The uses permitted within the transitional area are yet to be determined but are described as predominantly non-residential in the Strathcona County MDP The closest portion of the City of Fort Saskatchewan to Edmonton Energy and Technology Park is designated for a large park space as a part of the North Saskatchewan River Valley system and the Westpark neighbourhood further east.

Canadian Forces Base (CFB) Edmonton is located along the western boundary of the plan area. The base uses the land along the plan boundary for training purposes, including a gun range, a parachute drop zone, and a munitions storage area. CFB Edmonton also includes two large runways capable of allowing for the takeoff and landing of large, fixed wing aircraft as well as a heliport. Due to the presence of the runways, there is a zoning overlay related to the possible flight paths, Noise Exposure Forecast (NEF) contours, and a bird hazard zone that extend into Edmonton Energy and Technology Park. The flight path zoning overlay restricts building height, while the NEF contours identify areas where noise would preclude more sensitive land uses, like residential uses. The height restrictions are dependent on the distance an individual site is from various portions of the runway, which is identified on the restricted covenant placed on the land titles of affected properties. The related bird hazard zone restricts any activities that would increase the presence of birds within its boundaries, including the development of conventional stormwater management facilities.

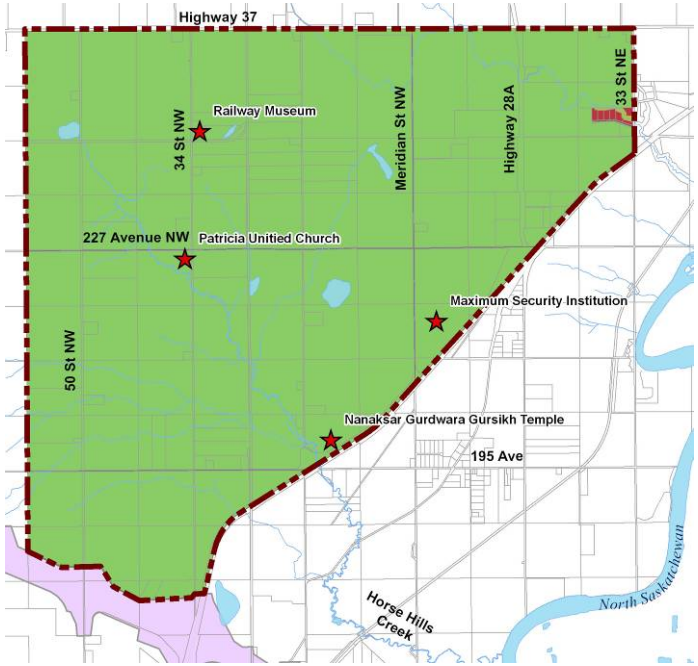
A mix of developed and developing lands within the City of Edmonton border the plan area south of the TUC. That area includes the developing low density residential neighbourhoods of Fraser to the southeast and Brintnell to the southwest. The Gorman area is also located along this boundary, and is located east of Manning Drive and north of 153 Avenue. It is currently designated for business uses, along with a location for a large commercial development and the Evergreen Cemetery and Memorial Gardens. It is anticipated that Gorman will be ultimately developed as a mixed area, containing business park, commercial, and residential uses centred on a future LRT station location. *In addition, to the southwest beyond the Manning Freeway are the undeveloped residential areas within the Horsehills ASP.*

(Bylaw 16767 Sept 23, 2014)

The plan area is currently zoned agricultural. However, there are several existing developments, which include a federal penitentiary, several religious assemblies, a railway museum, and an existing country residential development,

as identified in Figure 4.

Figure 4: Existing Zoning



ASP Boundary

Existing Zoning

- Agricultural Zone
- Metropolitan Recreation Zone
- Rural Residential Zone
- Waterbodies
- Existing Property Lines
- Existing Uses
- Transportation Utility Corridor

3.5 Existing Infrastructure

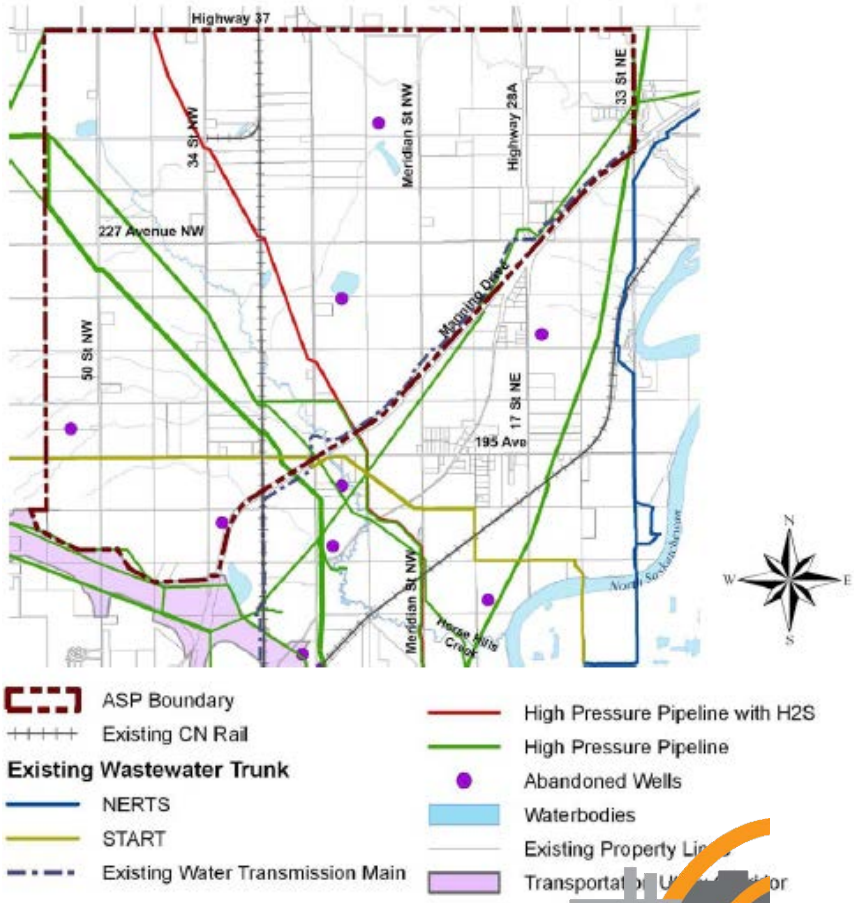
Existing Utilities and Pipeline Corridors

There are a number of major pipelines that run through this area, primarily carrying oil and gas related substances. There is a high pressure H2S line running from the northwest portion of the plan area towards the south central portion of the plan area. There are five additional high pressure gas lines running from the northeast and northwest, as well as four abandoned wellsites north of Manning Drive. These are identified in Figure 5.

The Capital Region Northeast Water Services Commission transmission line is located along Manning Drive. Two Alberta Capital Region Wastewater Commission Trunks, the Northeast Regional Trunk Sewer and the St. Albert Regional Trunk Sewer run through the plan area. The St. Albert Regional Trunk Sewer (START) generally runs along 195th Avenue NW while the Northeast Regional Trunk Sewer (NERTS) runs along 34th Street NW.

The Radke Report identifies the potential for a process waterline to extend somewhere within the ASP area from the Goldbar Water Treatment plan to AIH (Exhibit 8.1). The same report also identifies Manning Drive as a suggested pipeline corridor in future to support AIH businesses (Exhibit 10-3), as it would provide a convenient linkage to the TUC for extension of future pipelines around the City of Edmonton.

Figure 5: Existing Pipelines and Well Locations (Bylaw 16175 Jan 23, 2013)



Existing Roads

The existing road network in the area is arranged in a typical rural grid pattern (Figure 6). The north south roads are spaced at one mile increments, such as 50 Street NW, 34 Street NW, 17 Street NE, and 33 Street NE. Meridian Street is also a north south roadway. It is on the alignment of Zero Street and is the dividing line between the East and West quadrants in the City. The east west roads are spaced at two mile increments and include 195 Avenue, 227 Avenue NW, and 259 Avenue NW (also Highway 37). All of these local roadways are generally rural in nature with ditches, gravel or cold mix asphalt surfaces, a 20 metre right or way, and an 80 km/hr operating speed.

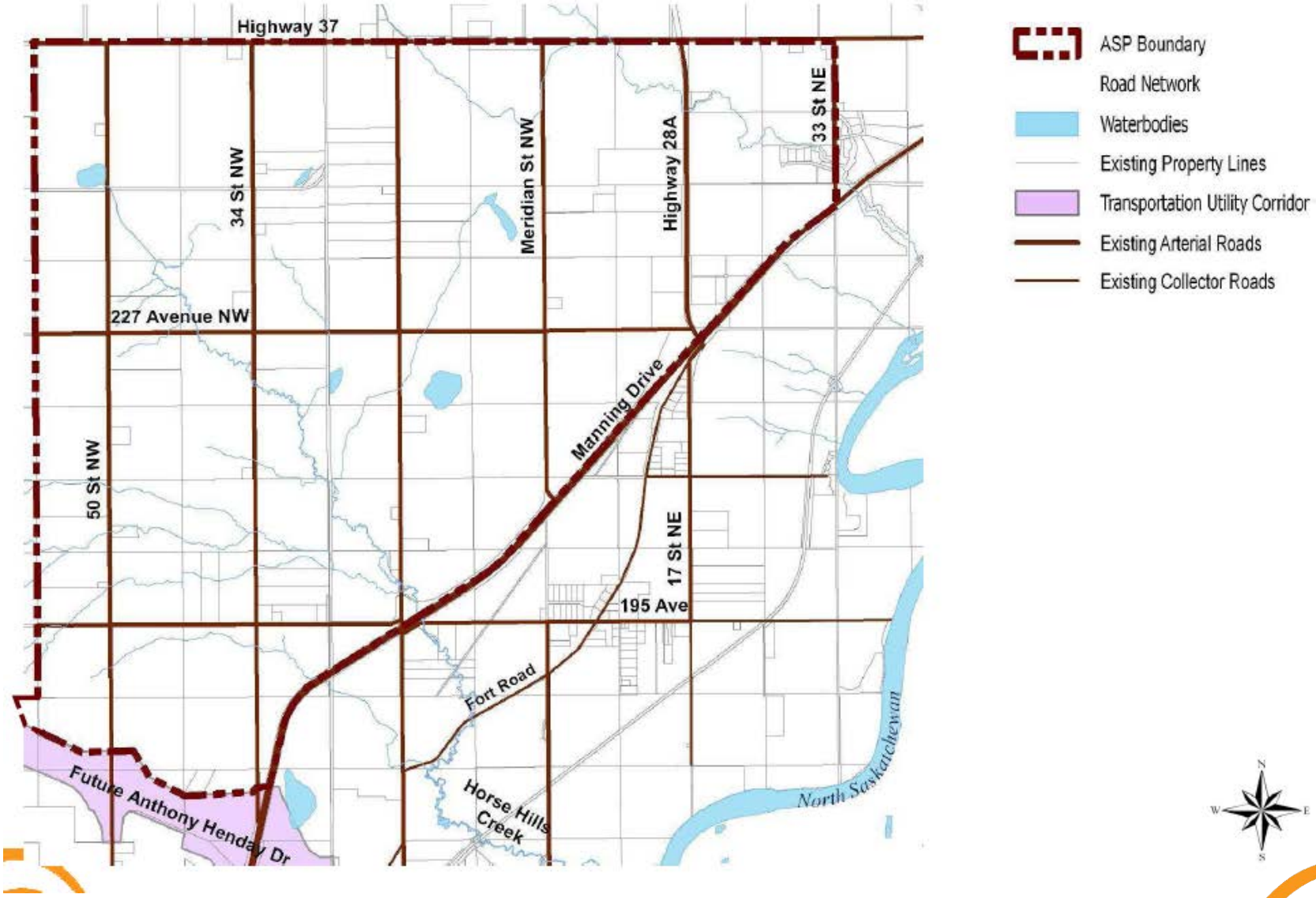
The area is also served by a number of rural high speed highways, including:

- Highway 37 which is an east west highway that forms the northern boundary of the plan area and is the north City limit.
- Highway 15, which is Manning Drive, and is a northeast southwest highway that forms the southeastern boundary of the plan area.
- Highway 28A which is a north south Highway that is aligned on 17th Street NE between Highway 37 and Highway 15.

Existing Rail

Canadian National (CN) Rail has a rail line running north-south through the plan area. This line, called the Coronado Subdivision, is a rail line running between Edmonton and northeastern Alberta including Fort McMurray. This railway connection provides an important method of goods shipment from the Edmonton area to regional and international markets.

Figure 6: Existing Roadways (Bylaw 16175 Jan 23, 2013)



4.0 PUBLIC INVOLVEMENT

Public involvement is important in the development of an ASP and is required by the Municipal Government Act. A public involvement plan was developed early in the planning process for the Edmonton Energy and Technology Park in order to ensure that public involvement was meaningfully incorporated throughout the project. The objectives of the public involvement process for this project were:

- To inform and engage landowners, residents, and other stakeholders of the planning process and conceptual plan for the area
- To identify key issues that the individuals, communities, and key stakeholders had regarding the plan
- To communicate to the public the proposed Area Structure Plan to date through a series of public events

The consultation process was comprised of two public involvement events and many key stakeholder meetings. The Area Structure Plan public involvement process has been reviewed and has been deemed complete.

4.1 June 2008 Information Session

An Information Session was held on June 18, 2008 in Patricia United Church, located at 3427 – 227 Avenue, from 4 – 8pm. The intent of the meeting was to make the public aware of the project, explain the planning process, and receive initial input from the public.

This Information Session was advertised on six portable signs throughout the study area and beyond. A combined information brochure and invitation was mailed to all landowners in the study area two weeks prior to the event.

The meeting was an open house format with information boards illustrating project details. Key project team members were available throughout the room to answer questions. A survey was also provided to allow the public to provide input on the information presented.

Over 194 people attended and 25 survey forms and comment sheets were submitted. The written input from these forms was compiled with other comments received after the Information Session. The most common responses included requests for more information, identifying that the area South of Manning Drive also needed to be planned, and that any development in the

area should be well coordinated. Additional details are included in Appendix 1.

4.2 Key Stakeholder Meetings

A number of stakeholders were specifically consulted during the preparation of the Edmonton Energy and Technology Park ASP. This stakeholder consultation was undertaken to gain base information about the plan area, to notify key stakeholders of the planning process, and to provide them an opportunity to express any preferences or concerns related to development in the area. All stakeholders were also invited to the information session and public meeting.

The project team undertook individual meetings with the neighbouring municipalities to the ASP area including representatives from Sturgeon County, Strathcona County, and the City of Fort Saskatchewan. The project team met with each municipality at the beginning of the planning process to notify them of the project and discuss any questions or concerns they had related to development in the northeast part of Edmonton. The team then met again with interested municipalities at the end of the process to provide them an opportunity to view the final concept and provide feedback on the chosen concept.

The project team met with the Land Use Committee of AIH to discuss this project and the broader industrial development planned for in the Capital Region. Other groups that the project team undertook individual meetings with regarding the project included representatives from Capital Health, Canadian Forces Base Edmonton, Canadian Pacific Rail, Canadian National Rail, ATCO Pipelines, TELUS, the Alberta Capital Region Wastewater Commission (ACRWC), and EPCOR Distribution.

The key stakeholder meetings identified a number of information pieces and issues related to the plan area. The following themes were identified:

4.2.1 Risk Management

Several groups identified risk management as a concern for this area, given that the plan introduces industrial development, which comes with a heightened risk for incidents that may affect surrounding lands. This has been addressed by identifying a risk management strategy in the ASP document and identifying future locations for emergency facilities.

4.2.2 Appropriate Separation Between Conflicting Land Uses

This area borders several different land uses that will remain after its development. Consideration for the interfaces between Edmonton Energy and Technology Park, CFB Edmonton, future development potential south of Manning Freeway, and the surrounding counties heavily influenced the development of the Edmonton Energy and Technology Park ASP.

4.2.3 Regional Context of Industrial Development

Industrial expansion in AIH will require supportive development to occur in the entire Capital Region. Discussions with key stakeholders included discussion about the different types of industrial opportunities in the region and how they will work together. This could include future transportation connections, utilities, shared pipeline projects, and other major infrastructure investments.

4.2.4 Maintaining Existing Land Uses

Existing land uses both on the boundaries of the plan, like CFB Edmonton, or within the plan require consideration as a part of the land use planning process, and were included in land use decisions as a part of the development of the Edmonton Energy and Technology Park ASP.

4.2.5 Non-Industrial Land Use

Some of the key stakeholders consulted requested that residential land uses also be incorporated into the ASP.

Council direction for this project identified industrial uses as the key land use for the plan area. Residential uses require separation from industrial uses, given that industrial production can increase noise, dust, smells, and other nuisance factors that are not desirable in residential areas. Residential development within the plan area would therefore require limiting industrial operations, which is intended to be the highest priority land use for the area. There would also be limitations on residential development in the western portion of the plan area due to its proximity to CFB Edmonton's military training area and the airfield noise contours.

Given the intent of this area to accommodate industrial demand and its existing limitations introduced by CFB Edmonton operations, residential development was not deemed to be consistent with the project's goals and was not accommodated within the plan area.

4.3 October 2008 Public Meeting

The second public event was held at the Nanaksar Gurdwara Gursikh Temple on October 1, 2008 from 4 – 8pm, with two formal presentations at 5pm and 7pm. The purposes of the public meeting were to provide the public an opportunity to review the final concept plan for the project and ask questions or provide comment to the project team.

The Public Meeting was advertised with a series of six portable signs throughout the study area and beyond. An invitation was sent on September 18, 2008 to property owners in the study area and to those who provided mail or email addresses at the June 2008 Information Session.

The meeting was also open house format with information boards. In addition to the information boards, two formal presentations followed by question and answer sessions were added to the October open house.

Over 317 people attended the second public meeting, and 59 participant surveys were received by the project team. The comments were compiled, with written responses, by theme after the Public Meeting. Common themes were:

- Planning for the south side of Manning Drive needs to be dealt with.
- Residential areas should be included in the ASP.
- More detailed information is needed.
- Environmental and land use issues need addressing.
- Timelines are needed.
- Members of the Sikh Temple do not want industrial development around their site and would like opportunity for residential uses on their property.

Based on these comments, Edmonton Energy and Technology Park has identified risk management strategies related to existing non-industrial uses in order to mitigate the impacts of industrial development in their vicinity. General timelines for development are identified in the ASP, though development will ultimately be governed by market forces.

The City of Edmonton has developed custom zoning in order to provide additional detail and provide clear regulations for industry as they relate to built form, eco-industrial implementation, risk management, and environmental protection. Additional details are provided in Appendix 2.

(Bylaw 16767 Sept 23, 2014)

4.4 October 2009 Public Meeting

The third public event was also held at the Nanaksar Gurdwara Gursikh Temple on October 27th, 2009 from 4 – 8pm. The purposes of the public meeting were to provide the public an update on the planning process and display some minor changes to the alignment of the arterial network caused by movement of the future connections to intersections in Anthony Henday Drive.

An invitation was sent to property owners in the study area. The meeting was also advertised in the Edmonton Journal.

The meeting was also open house format with information boards. Staff were available to answer any questions attendees had and explain the project to those who had not attended previous meetings

Over 122 people attended the third public meeting, and 29 participant surveys were received by the project team. Of those 29 surveys, only 15 provided comments. The comments were compiled, with written responses, by theme after the Public Meeting. Common themes were:

- Concern about the use of prime agricultural land and/or sensitive natural areas for industrial growth.
- Concern about impacts of industrial growth, such as air pollution, vibration, and noise.
- More detailed information is needed on wind direction, potential connection to any development south of Manning, and marketing efforts.
- Preference for a formal presentation over a public open house format and requests for more frequent communication and updates for the community.
- Concern with the City of Edmonton's processes, including the frequency and style of public meetings, scheduling of Public Hearings, and lack of transparency
- Approval of the eco-industrial approach of the Area Structure Plan and the perceived environmental leadership shown by the City of Edmonton in using this approach.

5.0 POLICY CONTEXT

There are many existing plans and policies that relate to the Edmonton Energy and Technology Park or the areas immediately surrounding it. Each of the plans, studies, or municipal programs that relate to development in Edmonton Energy and Technology Park will be discussed below.

5.1 Capital Region Board

The Capital Region Board, established on April 15, 2008, is comprised of the 25 municipalities that make up the Capital Region. Their priorities are "to create a long-range plan for regional land use and infrastructure such as roads and transit; develop an electronic system to share geographic information; and develop a strategic plan for social and affordable housing"

In light of these priorities, the Capital Region Board is mandated with the review of planning bylaw applications that meeting defined referral criteria under the Transitional Regional Evaluation Framework (Ministerial Order L:005/08). The goal of this review is to *"ensure consistency with long-term regional interests, the Capital Region Board Regulation, and the "Working Together" report, while the Capital Region Growth Plan is under development"* (Ministerial Order L:005/08). An Area Structure Plan is referred to the Capital Region Board when it is within 0.5km of defined roadways, adjacent to a Transportation / Utility Corridor, within Strathcona County's rural service area and meets defined conditions, would result in more than 1000 residents, and/or will accommodate heavy industry. Given that the Edmonton Energy and Technology Park ASP meets several of these criteria, it will be referred to the Capital Region Board by the City of Edmonton prior to Third Reading of the Bylaw.

5.2 Capital Region Integrated Growth Management Plan – Final Report on Core Infrastructure

As a part of re-establishing regional planning in the Capital Region, a number of studies were undertaken to determine base conditions and to create parameters for the continued growth of shared services and systems. One of these studies is the Final Report on Core Infrastructure. This report studied the base conditions of key regional infrastructure, including highway systems, airports, rail links, transit, water, wastewater, power, and pipeline corridors. It used this base information to identify any gaps

in the existing system and create a strategy for accommodating long term regional growth for these services and utilities. The Final Report on Core Infrastructure identifies several infrastructure items that impact the Edmonton Energy and Technology Park plan area. This includes pipelines, the highway system, water, and power.

The report identifies that Manning Drive should be used as a pipeline corridor in the region connecting to corridors in the TUC, which could serve as a linkage for businesses in Edmonton Energy and Technology Park. It identifies roadway improvements impacting the plan area, which includes the ultimate full construction of the TUC and lane expansions on Manning Drive and Highway 28A. A new EPCOR water main is intended to be extended within Edmonton Energy and Technology Park to provide water looping and enhanced service for the main serving Gibbons and surrounding area. Related to power service, the long term plan includes the twinning of an existing 240 kV transmission line in the plan area. Additional detail on these infrastructure improvements are identified in the servicing sections of the Edmonton Energy and Technology Park ASP.

5.3 *City of Edmonton Strategic Plan – The Way Ahead and MDP* *(Bylaw 16175 Approved Jan 23, 2013)*

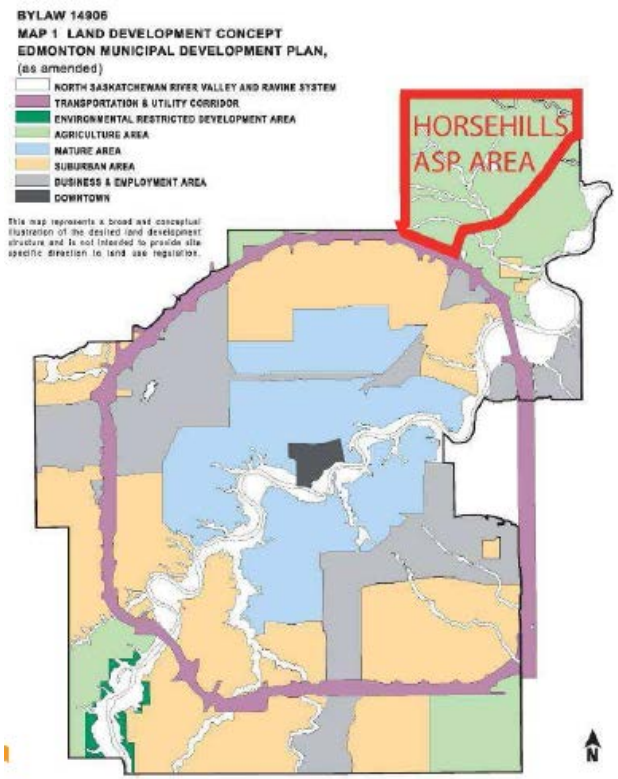
City Council's Strategic Plan – The Way Ahead has a ten year strategic goal to "Diversify Edmonton's Economy" which states that "Edmonton is recognized as an economic powerhouse, maximizing the diversity of its economic advantages, including its location as Port Alberta and as a portal to the north; as the urban centre of regional industrial development; as a knowledge and innovation centre for value-added and green technologies and products". This will be achieved through the three-year priority goal to "Work with both public and private sector partners, to improve the favourable business and investment climate for: Eco-industrial based economy; Logistics and Servicing for the needs of the North and Asia; Green technology development and commercialization; and entrepreneurs".

The plan area is designated as industrial/business in the MDP, The MDP states in Section 6 - Supporting Prosperity - that "Edmonton's industrial growth capacity is expanded in this plan by designating a new industrial area in the northeast and an industrial reserve area in the southeast. The northeast industrial area will accommodate economic growth from value added petrochemical processing and supporting products and services, manufacturing and research, and rail and road based logistic

operations.". In addition, it also states that "Edmonton will promote sustainability and innovation through adoption of eco-industrial standards and approaches to land and property development and business operations. This will focus on the creation of a chemical industry cluster employing business-to-business eco-industrial relationships."

The areas of the ASP adjacent to municipal boundaries are identified in the MDP as being a part of the Intermunicipal Fringe, meaning that the ASP area is close to neighbouring counties and municipalities. The MDP stipulates that the City will "work cooperatively with neighbouring municipalities to ensure effective use and development of the City's "fringe" lands." It further identifies that an ASP must be circulated to municipalities within 1.6km of its boundary. The MDP identifies many policies intended to encourage industrial development, including ensuring enough land available to support industrial growth. It also provides direction on issues of public safety and risk associated with heavy industrial uses. The existing MDP also supports sustainable development. The MDP encourages retaining natural areas, using sustainable design principles and ecological protection, and incorporating ecology into the planning of new areas. It places priority on using land effectively and states that long term environmental and fiscal sustainability should be incorporated into planning. The MDP promotes attractive and functional developments by identifying those urban design principles that should be promoted. It also encourages business clustering and intensifying land uses around major transit lines and employment areas.

Figure 7: Land Development Concept Municipal Development Plan Bylaw 15100 (Bylaw 16175 Jan 23, 2013)



The areas of

the ASP adjacent to municipal boundaries are identified in the MDP as being a part of the Intermunicipal Fringe, meaning that the ASP area is close to neighbouring counties and municipalities. The MDP stipulates that the City will *"work cooperatively with neighbouring municipalities to ensure effective use and development of the City's "fringe" lands (Sec. 1.1.9)."* It further identifies that an ASP must be circulated to municipalities within 1.6km of its boundary. The Edmonton Energy and Technology Park ASP will therefore need to be circulated to Sturgeon County for comment. (MDP - Schedule A) The MDP identifies many policies intended to encourage industrial development, including ensuring enough land available to support industrial growth (Sec. 1.1.5). It also provides direction on issues of public safety and risk associated with heavy industrial uses (Sec. 1.1.6). The existing MDP also supports sustainable development. The MDP encourages retaining natural areas, using sustainable design principles and ecological protection, and incorporating ecology into the planning of new areas (Sec. 1.1.3a & 2.4.6). It places priority on using land effectively (Sec. 1.1.12) and states that long term environmental and fiscal sustainability should be incorporated into planning (Sec. 1.1.13). The MDP promotes attractive and functional developments by identifying those urban design principles that should be promoted (Sec.1.1.3). It also encourages business clustering (Sec. 1.1.7) and intensifying land uses around major transit lines and employment areas (Sec. 1.3.4). An amendment to the existing MDP would be needed for the Edmonton Energy and Technology Park ASP under the existing MDP, given that the plan area is currently designated Agricultural. However, the MDP will soon be superceded by the new MDP entitled 'The Way We Grow'. The plan area is intended to be designated as industrial/business under the new MDP, The proposed MDP states in Section 5 - Supporting Prosperity - that "Edmonton's industrial growth capacity is expanded in this plan by designating a new industrial area in the northeast and an industrial reserve area in the southeast. The northeast industrial area will accommodate economic growth from value added petrochemical processing and supporting products and services, manufacturing and research, and rail and road based logistic operations.". In addition, it also states that "Edmonton will promote sustainability and innovation through adoption of eco-industrial standards and approaches to land and property development and business operations. This will focus on the creation of a chemical industry cluster employing business-to-business eco-industrial relationships.

5.4 Sturgeon County MDP

The Edmonton Energy and Technology Park ASP boundary is directly south of Sturgeon County. This portion of Sturgeon County is identified in the Sturgeon County MDP as the "South Sturgeon Study Area". This area was identified by the Municipal Government Board (MGB) as an area that required a statutory plan in an Order issued in 1998, but to date no such plan has been undertaken. The area adjacent to Edmonton Energy and Technology Park in Sturgeon County is designated "Intermunicipal Fringe" and "Environmental Protection" adjacent to the riverbank in the Sturgeon County MDP.

The area designated as intermunicipal fringe is governed largely by the agricultural policies in the MDP. This stipulates large parcel sizes (in excess of 80 acres) aside from parcels created for the purpose of separating homesteads from farmland (Sec. 2.3-2.7). It is also identified that development proposals within this area will be referred to the City of Edmonton for comment (Sec. 15.5.v).

The environmental protection section is intended to protect environmentally significant areas such as flood prone areas, riverbanks, shores, and wildlife corridors. It provides development criteria and parameters including requirements for assessments and studies prior to the development of non-agricultural land uses such as multi-lot subdivisions (Sec 11.0).

5.5 City of Fort Saskatchewan MDP

The Fort Saskatchewan MDP designates the lands adjacent to the Edmonton Energy and Technology Park ASP, separated from the plan by the North Saskatchewan River, as Parks, Recreation and Open Space in association with the North Saskatchewan River. The routing of the TransCanada Trail is anticipated to be along the eastern boundary of the North Saskatchewan River within the designated park area, which will connect into Edmonton's river valley trails system.

In relation to intermunicipal cooperation, Fort Saskatchewan's MDP identifies that they will work together with neighbouring municipalities to establish planning frameworks and land use patterns that benefit both municipalities, maintain open lines of communication, and seek partnerships in service provision. (Section 13.0).

5.6 The Way We Move

(Bylaw 16767 Sept 23, 2014)

The Transportation Master Plan (TMP) entitled 'The Way We Move' was approved in September 2009. It is intended to guide the development of transportation systems in Edmonton and accommodate system requirements. The TMP identifies potential regional roadway networks that may be developed within the plan area, but ultimate alignments have not been determined. Manning Drive is identified as a 'highway connector roadway' linking Edmonton's inner road system to regional communities and the northeast of the province.

LRT extension is possible from the existing terminus at Clareview into the northeast area in future, but no implementation strategy for a northern extension of the LRT is identified in the text.

5.7 Alberta's Industrial Heartland

(Bylaw 16767 Sept 23, 2014)

AIH is a large industrial/chemical area northeast of the City of Fort Saskatchewan intended to facilitate a heavy industrial 'precinct'. AIH is approximately 580 square kilometres including the Edmonton Energy and Technology Park, and is located in five municipalities; City of Edmonton, Lamont County, Sturgeon County, Strathcona County, and the City of Fort Saskatchewan. Its particular focus is the chemical industry, as it is well placed to provide processing facilities to support the oil and gas exploration in Alberta.

There is high connectivity between the Heartland and the Edmonton Energy and Technology Park ASP. The CN Coronado Subdivision rail line runs from the Edmonton Energy and Technology Park ASP area into the Heartland region. In addition, Highway 15/Manning Freeway is also a direct connection through Fort Saskatchewan and the AIH. *The development of the Anthony Henday Drive will also provide highway connections between the Northeast ASP and the Heartland via the Yellowhead Highway and Highway 21.*

(Bylaw 16767 Sept 23, 2014)

Land use in AIH is governed through complementary ASPs adopted by each of the member municipalities. The land uses contained within the Heartland area are primarily heavy industrial. A buffer, approximately 1.6 km in width, is intended to accommodate agricultural, commercial, and light to medium industrial uses and surrounds the heavy industrial uses to provide appropriate separation from adjacent development. It also contains provisions for an environmental protection area that abuts the North Saskatchewan River valley.

5.8 Industrial Land Strategy

The Industrial Land Strategy (ILS), approved by Council in 2002, was developed with a goal to "increase the prosperity of the City and its citizens by accommodating the growth and development of Edmonton's existing industrial businesses and attracting new ones. (p.3)" It identifies the make-up of existing industrial areas of the city and the types of businesses best suited to the different areas of existing or planned industrial development in Edmonton.

The northeast area is shown as having a very low share of the overall demand for industrial land in Edmonton, at only 7% of the overall market for the City of Edmonton. The ILS anticipates that this demand will come from growth in the Food and Beverage Industry, with some activity in Plastics, Chemicals, and Refined Petroleum Products. However, this considers only the available industrial land within this sector of the city, much of which is adjacent to residential uses and/or requires redevelopment, which poses significant market barriers when compared to available greenfield sites.

(sentence deleted Bylaw 16767 Sept 23, 2014)

5.9 Smart Choices

Smart Choices is a City of Edmonton program that provides recommendations on best practices in planning to improve development in the City of Edmonton. While these recommendations primarily relate to residential development and the redevelopment of commercial and industrial developments along major roadways, there are policies that can be translated to other land use types.

Smart Choices recommends that areas including a major transit centre, such as an LRT station, consider Transit Oriented Design (TOD). This encourages denser development adjacent to the transit centre to take advantage of the associated transit system. While this theory primarily supports residential development, it could be applied to development of an employment area.

Smart Choices also improves walkability for new developments. While this was primarily benefiting residential areas, walkability should also be considered in the context of an employment area. This could include considerations for the design of streetscape, setbacks of buildings, provision of convenience commercial opportunities, or other factors that would facilitate the ability to reduce vehicle trips.

5.10 North Saskatchewan River Valley Area Redevelopment Plan

The North Saskatchewan River Valley Area Redevelopment Plan (NSRVARP) applies to several streams and tributaries flowing into the North Saskatchewan River, as well as the river itself, which is to the southeast of the boundary of the Edmonton Energy and Technology Park ASP area. The intention of the NSRVARP is to identify the river valley area as a metropolitan park and environmental protection area.

Beyond the basic park and environmental protection intent of the plan, the NSRVARP also identifies methods the City of Edmonton may use to acquire privately owned portions of the river valley and ravine system (Sec. 3.2.7), and identifies regulations around the introduction of new transportation crossings to the river valley system (Sec. 3.4.1 & 3.4.2).

5.11 Zoning Bylaw

The large majority of the lands within the plan area are currently designated AG (Agricultural). There is also a rural residential development designated RR (Rural Residential).

5.12 Risk Management Policy

The Major Industrial Accidents Council of Canada (MIACC) was created in the late 1980s as Canada's reaction to a major industrial accident in Bhopal, India in 1984. MIACC's purpose was to consider voluntary measures to increase prevention, preparedness, and response to industrial accidents. The Council was comprised of government and industry leaders who prepared guideline documents that were voluntarily used by some businesses and government bodies. The Council itself was dissolved in 1999 due to a lack of operational funding, but is still referred to by many Canadian municipalities. Both Strathcona and Sturgeon Counties use MIACC principles in their legally binding planning documents.

Strathcona County stipulates two distance thresholds around heavy industry in the IH (Heavy Industry) District in their Land Use Bylaw. It identifies that any heavy industrial development may not impose a greater than 1 in 1,000,000 risk of death outside a 3.0km radius from an industrial property boundary. Similarly, an industrial development may not impose greater than 1 in 100,000 risk of death outside a 1.5km radius from its property boundary. A Heavy Industrial Overlay is also included as a part of the Land Use Bylaw and restricts people-intensive

industrial/commercial uses within the 1.5 and 3.0km radii, such as retail and offices. It also restricts Floor Area Ratio and includes provisions to enhance emergency provisions within buildings.

(Bylaw 16767 Sept 23, 2014)

The intent of the Edmonton Energy and Technology Park Risk Management Policy is to be consistent with the Capital Region Growth Plan's purpose of regional buffer areas.

The City of Edmonton's current risk management approach also references MIACC and outlines that the MIACC principles are one of several guideline documents that are to be used to evaluate risk and determine risk management. It requires that a risk assessment be completed for projects that would create incompatibility between heavy industry and residential uses. MIACC principles are to be considered for greenfield sites.

Edmonton Energy and Technology Park will also use MIACC principles for the management of risk within the plan area's boundaries, consistent with the risk management approach of the City of Edmonton which considers the source of risk and appropriate mitigation measures. Custom zoning will be developed that will identify buffer areas restricting uses to those that pose a risk of death of no greater than 1:1,000,000. Furthermore, industrial businesses within the Petrochemical Cluster Precinct that would introduce risks to public health or safety will be required to submit a risk assessment that incorporates appropriate buffers and other cumulative risk management measures using the principle of MIACC prior to issuance of zoning approvals to ensure that they do not pose unacceptable risk to the surrounding area. Beyond the municipal level, the Province of Alberta also identifies risk management and cumulative effects legislation, through the Cumulative Effects Assessment and Management Policy and the Environmental Protection and Enhancement Act.

Edmonton Energy and Technology Park will also use MIACC principles as a reference for the management of risk within the plan area's boundaries, consistent with the risk management approach of the City of Edmonton.

Beyond the municipal level, the Province of Alberta also identifies risk management and cumulative effects legislation, governed by Alberta Environment through the Cumulative Effects Assessment and Management Policy and the Environmental Protection and Enhancement Act.

5.13 Natural Areas Policies

In addition to the above mentioned policies, this area will also fall under the Natural Area Systems Policy (C-531), the Natural Connections Strategy Plan, the City of Edmonton Environmental Policy (C-512), the Interim Wetland Policy, and Provincial Wetlands Policies. These have been addressed in the Ecological Network Analysis.

5.14 Historic Resources

The City's Historic Resources Management Plan requires the City of Edmonton to identify and assess known historic resources and encourage them to be designated and/or incorporated into new development proposals. The program seeks to ensure that notable architecture that represents elements of the areas original development patterns are noted and incorporated in the areas future expansion and development. This ensures that the area over time develops a rich architectural variety that positively reinforces the areas identity. The Historic Resources Management Plan does not seek museum type developments, but ones that creatively adapt resources to new uses.

All efforts must be taken to ensure that those resources identified on the Inventory of Historic Resources in Edmonton must be included and incorporated in all new development proposals.

6.0 GUIDING PRINCIPLES

This plan is intended to create a new kind of industrial development in Edmonton that incorporates economic opportunity with eco-industrial principles. This brand of industrial development is intended to look, feel, and function differently than a conventional industrial park. In order to create an ASP that results in an industrial park that would achieve those differences, the following questions were considered:

> *How can we make Edmonton Energy and Technology Park the kind of place businesses want to locate in?*

and,

> *How can we make industry 'green' without compromising the bottom line?*

While these seem like basic questions, using them to shape a new kind of industrial plan was a challenge. These fundamental questions help to create a set of guiding principles that will lead development to achieve these results. These principles provide direction to answer the questions and to help identify what Edmonton Energy and Technology Park is intended to stand for.

6.1 Edmonton Energy and Technology Park stands for: Sustainable Development

Developments that are built to achieve three bottom line objectives: last longer, improve business performance, and create more comfortable working and living environments. They also provide choices for people – whether that means choices in the way people travel to and between them or adaptability in the way people or businesses use a site over time. Therefore, development in Edmonton Energy and Technology Park will be compact, varied, well connected, and flexible to maximize the area's potential while minimizing its footprint. The development in Edmonton Energy and Technology Park will consider its life cycle costs and look for innovative ways to reduce the carbon footprint it makes.

6.2 Edmonton Energy and Technology Park stands for: Industrial Ecology and Efficiency

One of the keys to a successful business is maximum output from minimum input. This means building efficiency into everything, including product use, staff, and

technology. Eco-industrial development goes a step further and improves efficiency in buildings, sites, and entire districts. Eco-industrial development gets businesses to collaborate to share services and use one business' waste as another business' resource. This kind of collaborative thinking reduces waste and increases profits – and increased profits results in stronger businesses.

6.3 Edmonton Energy and Technology Park stands for: Effective Transportation

Edmonton Energy and Technology Park will be designed to maximize connectivity between businesses, sub-areas, the Edmonton region, and beyond. It will be easy to get to and ship from for business purposes and employees.

It will maximize choice in travel modes including road, rail, transit, and trails in order to get people and goods to the places they want to go. It will also maximize use of the existing transportation system.

6.4 Edmonton Energy and Technology Park stands for: Land Use Compatibility

Industrial development can introduce nuisance factors and introduces the risk of industrial accidents or reduced air quality. This can affect the land adjacent to industrial developments. In Edmonton Energy and Technology Park, nuisance and risk intensive uses will be carefully located to cause as little disturbance as possible to the rest of the plan area. The intensity of industrial use will decrease as it approaches non-industry uses to ensure that businesses in this area are compatible with one another.

6.5 Edmonton Energy and Technology Park stands for: Innovative Infrastructure

Traditionally, infrastructure has been designed to remove natural systems from the process of providing the necessary infrastructure and services to businesses.

Edmonton Energy and Technology Park will put nature back into the system by identifying groundwater infiltration and methods of stormwater servicing that more closely represent the landscape, consistent with low impact development practices. Process and/or stormwater will be recycled for use onsite where viable to reduce demands on the system and water conservation will be pursued. Energy production will incorporate alternative and renewable energy sources that minimize carbon use. Waste management will be minimized through diversion, or safe disposal of wastes that are not recyclable.

6.6 Edmonton Energy and Technology Park stands for: Environmental Protection

The environment is often seen as an obstacle in traditional land development. In Edmonton Energy and Technology Park, environmental responsibility will instead be considered an opportunity. Natural areas will be integrated into development in ways that will respect their value and future sustainability while also enhancing outdoor recreation opportunities and the appearance of the plan area. Conserving, and in some cases restoring, a functional ecological network within the context of an industrial area will be a priority for the plan area.

6.7 Edmonton Energy and Technology Park Stands for: Effective Implementation

Innovative ideas often introduce longer review periods and more rigorous information requirements than conventional development strategies because little or no precedent is available to base their application on. In order to reduce this impact, all efforts will be made to ensure the information requirements for development in this area are clear. Where necessary, custom rules and regulations will be adopted for the area to provide clear direction and streamline the application process. Monitoring will be incorporated to ensure that the goals of the plan area are being met.

The following sections will identify specific policies and regulations that are based on these fundamental principles. The icons related to the principles above will be displayed adjacent to areas of the plan specifically emphasizing one or more of these key principles.

7.0 DEVELOPMENT CONCEPT

(Bylaw 16767 Sept 23, 2014)

The land uses chosen for the plan area have been designed specifically to take advantage of the chemicals and products to be developed in AIH and elsewhere in the province.

7.1 Land Use Precincts

(Bylaw 16767 Sept 23, 2014)

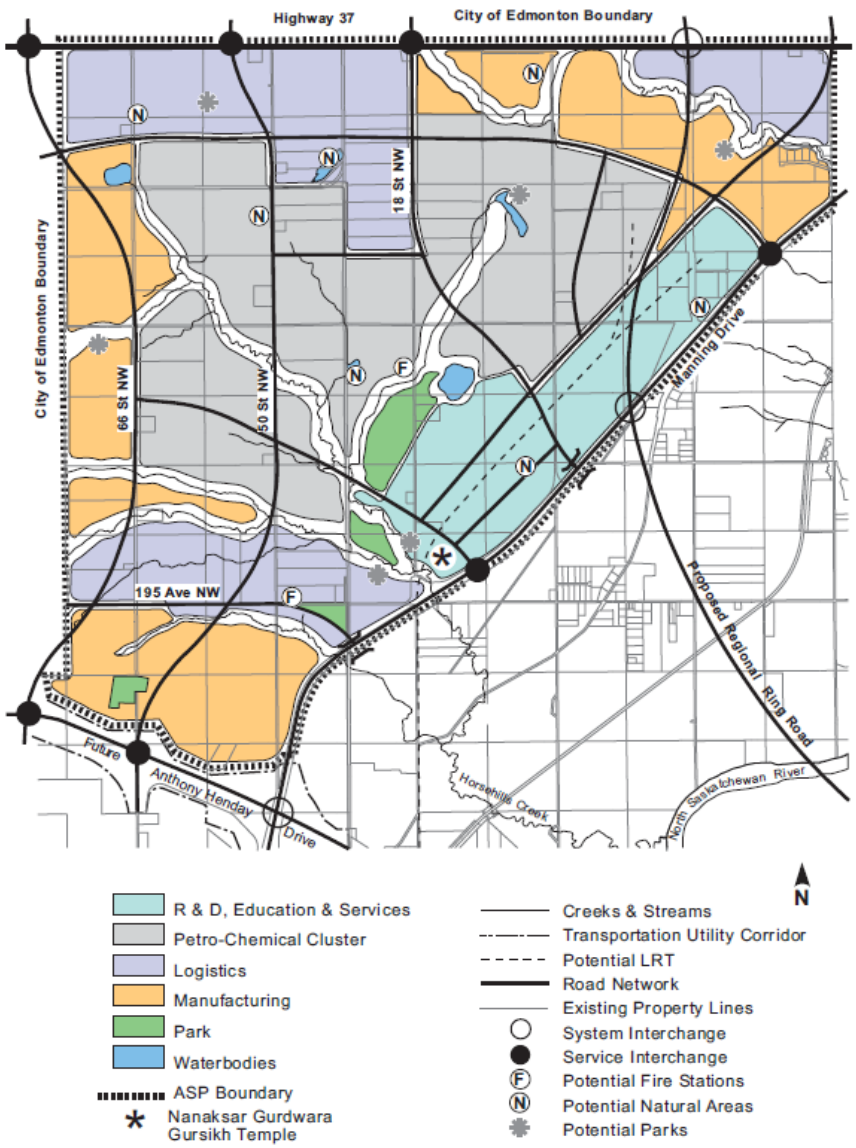
In order to use the petrochemical industrial resources, and to achieve the goal of an industrial plan focused on eco-industrial principles, four main land use precincts are needed.

These are a petrochemical cluster, manufacturing, logistics, and research and development park.

The petrochemical cluster precinct will provide the economic driver of the area. It will need a supportive industry in order to function well, which requires the development of logistics, supportive manufacturing, and business park uses.

Each of the land use precincts will be described as shown in Figure 8. The principles of eco-industrial development will be identified as they relate to each individual land use. Specific policies related to their development will also be included in each section.

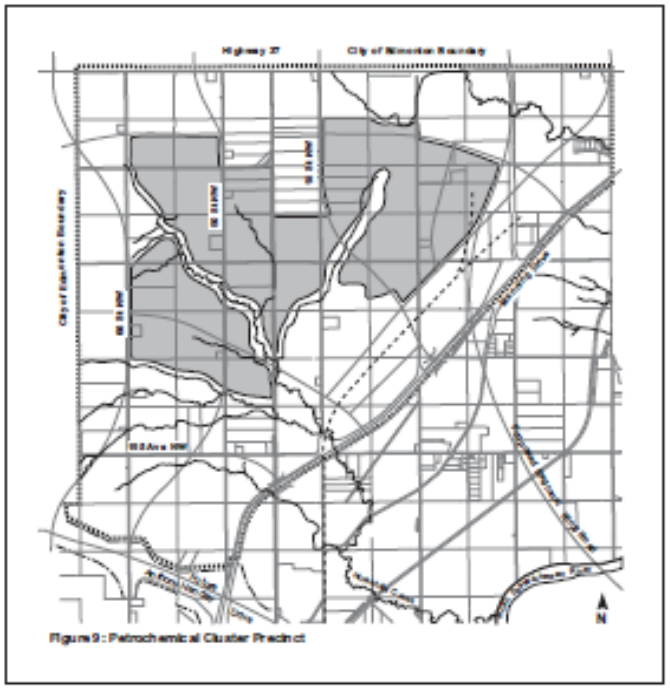
FIGURE 8: DEVELOPMENT CONCEPT



7.2 Petrochemical Cluster Precinct

The heart of the plan area will incorporate the petrochemical cluster (Figure 9). This area will produce the chemical products that will be refined, research, molded, and moved in other parts of Edmonton Energy and Technology Park.

Figure 9: Petrochemical Cluster Precinct (Bylaw 16767 September 23, 2014)



The petrochemical cluster land use will be largely comprised of chemical facilities, but will also include any necessary storage or trans-shipment facilities specializing in chemical processing. As development related to chemicals can pose an elevated risk to the general public in the event of an accident, the petrochemical cluster land use has been located in the centre of the plan, isolating it from any existing or future residential developments. This central location also provides the ability to create larger lots to accommodate various sizes of chemical plants. *(Bylaw 16767 Sept 23, 2014)*

Example Uses in the Chemical Cluster Precinct may include:

- Chemical Plants
- Local power generation facilities
- Local wastewater treatment facilities
- Recycling centres
- Ancillary Warehousing

Uses in the Chemical Cluster Precinct will not include:

- Nuclear power facilities

- Waste Stockpiles
- Landfills

Policy

1. Any necessary smokestacks or other venting structures will be designed to reduce any adverse impacts on air quality for the surrounding area, in accordance with Provincial and Federal legislation.

2. Waste outputs, like steam or hydrogen, may be traded between industrial developments in this area using a local private pipe system located within road right-of-way or on-lot easements.

3. Industrial businesses that would introduce risks to public health or safety are required to submit a risk assessment prior to the issuance of zoning approvals to ensure that they do not pose unacceptable risk to the surrounding area.

(paragraph deleted Bylaw 16767 Sept 23, 2014)

7.3 Logistics Precinct

(Bylaw 16767 Sept 23, 2014)

Logistics facilities are important to the chemical and manufacturing industries, as they provide the means by which chemical and other manufactured products can be gathered and shipped to local or international markets. This area is also intended to accommodate the enhancement or assembly of products or equipment prior to shipment. The uses within the logistics area, highlighted below (Figure 10), will include trans-shipment facilities, storage facilities, and packaging facilities. This precinct has been located adjacent to rail facilities and the best roadway connections to local and regional roadways.

Figure 10: Logistics Precinct (Bylaw 16175 Jan 23, 2013)

Uses in the Logistics Precinct may include:

- Intermodal yards
- Trucking yards
- Packaging facilities
- Tank farms
- Courier services
- Warehouses
- Palleting facilities
- City-owned integrated services facilities

Uses in the Logistics Precinct will not include:

- Self-storage facilities

Policy

1. Use of rail and pipelines is encouraged to reduce roadway congestion, transportation costs, and greenhouse gas emissions.

2. All properties adjacent to a rail line should consider the extension of rail lines at the time of subdivision to maximize rail access for the entire plan area

3. Outdoor storage areas are permitted, but must be largely screened from roadways using landscaping, fencing, public art, or other methods as appropriate.

4. That intermodal facilities based on rail will be located interior to the plan.

7.4 Manufacturing Precinct

(Bylaw 16767 Sept 23, 2014)

Supportive manufacturing is another use for chemical cluster development which will cater to businesses that use material from chemical plants, to create finished goods such as plastics and oils. This area is also intended for services provided by other land uses in the plan area to support its business functions. The manufacturing land use is located for access to rail and major roadways for the ease of trans-shipment and goods movement (Figure 11).

Figure 11: Manufacturing Precinct (Bylaw 16767 September 23, 2014)

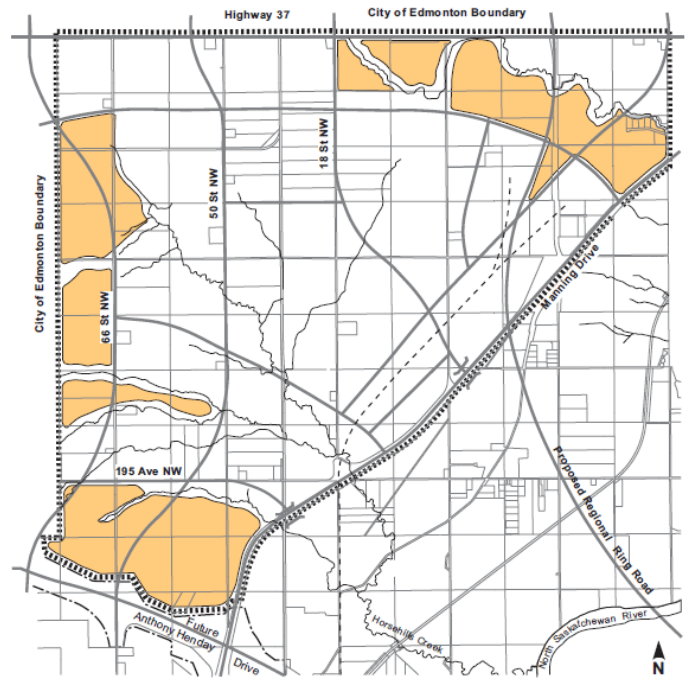


Figure 11: Manufacturing Precinct

Example Uses in the Manufacturing Precinct may include:

- Plastics facility
- Pharmaceutical production
- Pipe coating or production

Uses in the Manufacturing Precinct will not include:

- Petro-chemical plants
- Land fills

Policy

1. Manufacturing developments are encouraged to cluster, or develop multiple uses within the same building, in order to use land more efficiently
2. Manufacturing processes that will generate noise or odour that may impact neighbouring developments may not be developed within 100 m of an existing residential use or existing agricultural homestead

7.5 Research and Development Park Precinct

The research and development park precinct is anticipated to be the strongest employment generator in the plan area and takes advantage of the availability of arterial roadways and the potential for LRT connections. The research and development park use is intended to include offices, laboratories, research and development centres, together with additional business opportunities that complement the development of the petrochemical cluster (Figure 12).

Figure 12: Research & Development Precinct (Bylaw 16175 Jan 23, 2013)

Uses in the Research and Development Park Precinct may include:

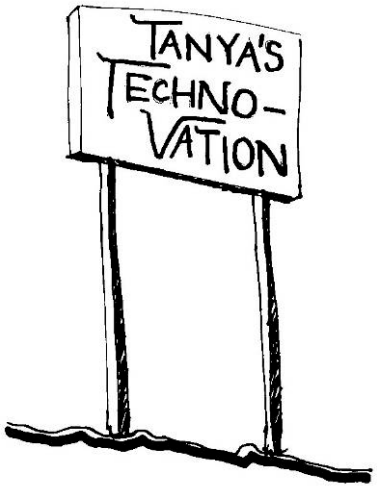
- Professional and Financial Offices
- Laboratories and Research Facilities
- Education Services (ie., technical school annexes)
- Business Support Services
- Limited Commercial Facilities
- Restaurants

Uses in the Business Park Precinct will not include:

- Shopping Centres
- New institutional uses
- General retail stores

Policy

1. Business park developments are encouraged to cluster, or develop multiple uses within the same building, in order to use land more efficiently
2. Outdoor storage of any kind is not permitted fronting onto arterials or freeways within the business park precinct
3. Arterial or freeway frontages must include additional landscaping to enhance the view corridor into the plan area
4. High quality building materials must be used in buildings located along arterial and freeway frontages
5. Site developments are encouraged to incorporate the theme of "technology, energy, and innovation" into their facades and signage, as appropriate



6. Developments are encouraged to incorporate visible green technology into facades and signage, such as photovoltaic cells, recycled materials, and green roofs

7. Uses within the plan area are encouraged to orient to research and development purposes

8. Commercial development may occur within the Business Industrial precinct, but they must only serve the plan area and may not be intended to serve a larger catchment area. These local uses may include small coffee shops or restaurants, copy centres, or other related uses.

9. Existing institutional uses within the Research and Development Park Precinct may continue to operate and expand on their existing sites in the Edmonton Energy and Technology Park. However, expansions to existing institutional uses through consolidating additional lands are not permitted. Should the existing institutional uses cease operations, their use designation will revert to Research and Development Park. In the interim, no uses that will introduce unacceptable risk will be permitted in proximity to these existing institutional uses. Also, a buffer must be established between the existing institutional uses and any adjacent development and will be identified in the sub-area planning stage.

7.6 Natural Area Integration

The Edmonton Energy and Technology Park development provides an opportunity to conserve and enhance the area's natural areas such as Horsehills Creek and its tributaries, other water courses, wetlands, potential wetlands, potential linkages, and other natural features. Together, these components will form the area's ecological network as outlined in the Edmonton Energy and Technology Park Area ASP, Ecological Network Analysis, 2008. This network is illustrated on Figure 13.

The integration of natural areas will be essential to achieving the area's eco-industrial vision. Natural areas will enhance industrial development by maintaining the ecological function of the land and by providing for amenity spaces for area workers as well as a green and healthy working environment.

The Ecological Network Analysis has been completed at a broad geographic level to identify the area's overall Ecological Network and to establish priorities for natural resource management and integration into the ASP.

However, additional investigations will be required either as part of future planning studies or during the site-specific development approval process. The following provisions will apply.

Policy

1. Additional studies and plans will be required prior to development, and the information requirements will vary depending on the stage of planning and development approval. Development applications will include sub-area planning, rezoning approvals, subdivision approvals, and development permitting approvals.

2. There will be an emphasis on requiring ecological information as key components of development applications in order for the applications to be received by the City and deemed "complete". This will assist the City in making informed decisions in a timely manner. Development applicants will be required to pre-consult by way of a meeting with the City before preparing and submitting any development application in order to confirm the need for and scope of additional studies, and when they are required.

3. Wherever plans or studies are required, they will be completed on behalf of applicants by qualified professionals and will be reviewed and approved by the City at the appropriate stage in the planning and development process. The most current plans, policies, regulations, and information, at the time of individual development proposal, should be utilized.

4. Natural areas that fall under the definition of Environmental Reserve under the MGA (Sec. 664(1)) will be acquired as Environmental Reserve by the City.

5. The City may consider accepting wetland compensation in-lieu of acquisition, in accordance with the Alberta Water Act and/or new Alberta Wetland Policy. The compensation may be directed towards the creation, restoration and/or management of other wetlands, water courses and/or water bodies.

6. The preliminary identification of Provincially owned water bodies has been conducted for the plan area. However, verification of crown ownership will be required at this stage.

7. Natural areas that do not qualify as Environmental Reserve may be considered for retention through

Municipal Reserve dedication to a maximum of 2% of the Gross Developable area. The City will place priority on those natural areas which it determines can form valued components of a connected ecological network.

8. The City will require the preparation of a Natural Site Assessment, completed in accordance with the Natural Site Assessment Guidelines, to support development applications that propose development or site alteration within or adjacent to any designated natural area or associated buffer. Objectives will include, but not be limited to: identifying existing protected ecological features; researching additional details of the valued ecological components; recommending measures to restore and enhance the feature; and recommending measures to mitigate impacts of site development on ecological features. The study will be reviewed and approved by the City at the earliest opportunity, be it the sub-area, zoning, subdivision, or development permit stage.

9. The City will use its guidelines for determining Environmental Reserve dedication for wetlands and other water bodies when applying buffers to those natural areas. Appropriate buffers will also be established surrounding other natural areas to ensure their protection. These will be determined at the zoning or subdivision stages, on a case by case basis and in consultation with the City.

10. Natural areas that are retained as public lands will have public access to provide the opportunity for them to be integrated with the open space network. River valley and ravine system will have public access consistent with the City of Edmonton's Top-of-Bank Development Policy.

11. The City will require development proponents to prepare Natural Area Management Plans for natural areas and buffers to be retained within or adjacent to developments, in accordance with the Natural Area Management Plan Guidelines. The Plans will be reviewed and approved by the City at the sub-area planning stage and should follow and be informed by the reports identified in Policy 8 above. .

12. The City will require that applicants complete a Tree Conservation and Landscape Plan as a component of development applications. The goal of these Plans will be to retain and plant as much natural vegetation as possible to augment the designated natural areas. Plan objectives will be: to assess the quality of forest

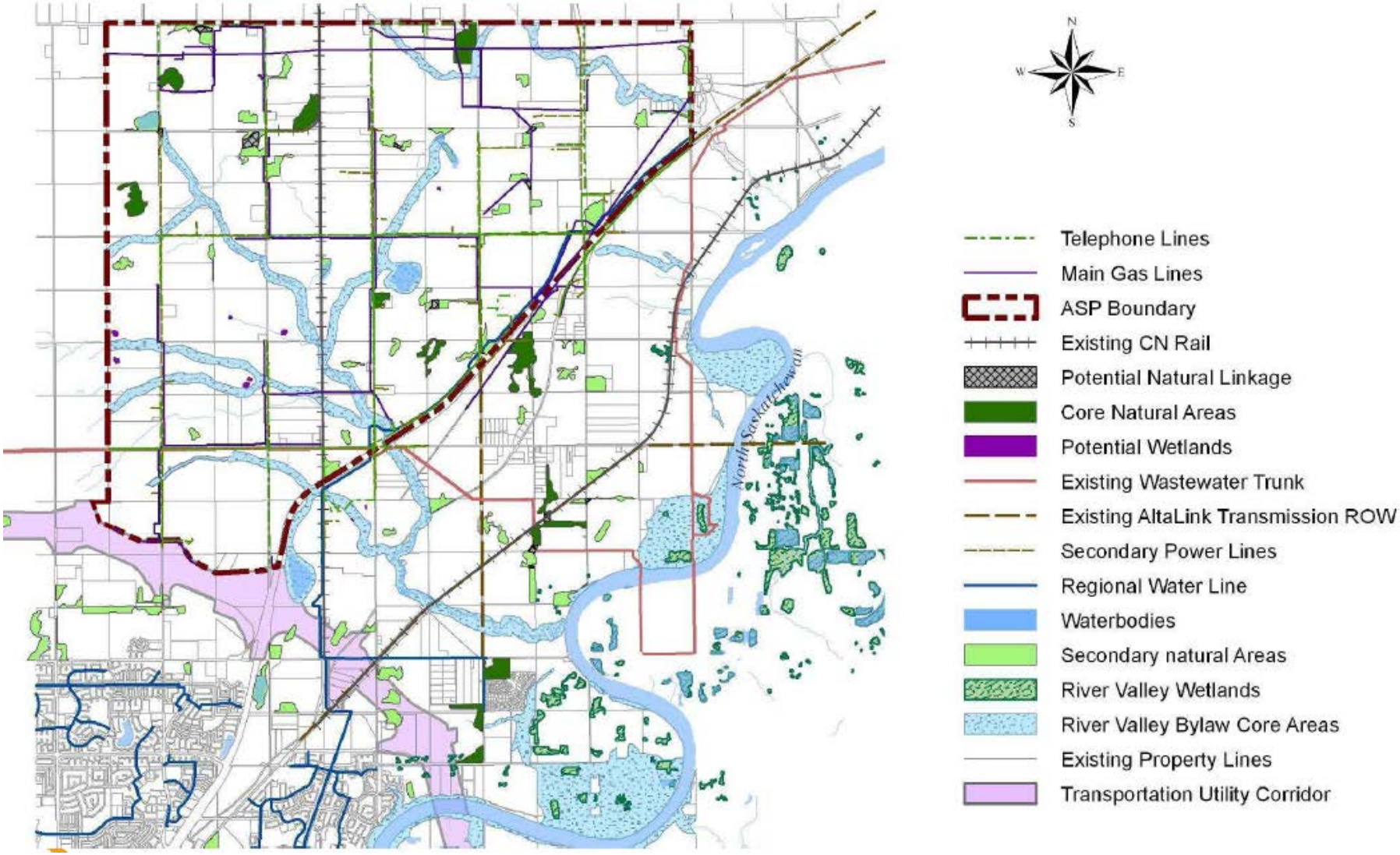
patches, specimen trees, windrows, and other naturally vegetated areas and their value for retention; to recommend site design and mitigation measures that will conserve those areas to be retained, to recommend measures to transition and integrate new landscaped areas with adjacent natural features, and to recommend new tree or vegetation planting that will contribute to native vegetation cover in the area. The Plans will be reviewed and approved by the City at the development permit stage.

13. Any proposed activities within the designated North Saskatchewan River Valley Area are regulated by existing Bylaws and the associated Area Redevelopment Plan. These regulations are supported by this Plan and will be reflected in the regulations of the City's Zoning Bylaw that are applied to the ASP area.

14. The City's Zoning Bylaw will be used as one of many tools to implement the area' ecological network objectives. The Bylaw will stipulate the natural areas where development is strictly controlled, and the regulations and site development criteria that apply. This zoning process will be completed by the City upon the approval of the Area Structure Plan.

15. In addition to these polices, the City will utilize all of its other various policy and regulatory means to achieve the goals as set out in the Municipal Development Plan in regards to planning for the natural environment.

Figure 13: Ecological Network (Bylaw 16175 Jan 23, 2013)



7.7 Open Spaces and Parks

A number of parks have been identified in addition to natural areas. A large city-wide park has been identified in the centre of the plan area. It is connected to natural areas and additional park spaces to create a central spine that extends through the centre of the plan area. This city wide park will be used for large programmed sporting events that would attract users from surrounding areas. In addition to this large park system, additional park locations are identified in the plan area.

Most existing industrial areas in the City of Edmonton do not incorporate smaller, local parks. Local parks will be incorporated into Edmonton Energy and Technology Park to provide recreation opportunities for area employees as well as the public at large, further differentiating this area from conventional industrial park development.

The Urban Parks Master Plan (UPMP) does not contemplate parks for industrial areas, and therefore does not designate a park type to be used in these cases. These park locations will most closely resemble the community or urban village park in intent, but are anticipated to be slightly smaller given the lack of necessity for community league facilities. They are therefore anticipated to be approximately four hectares in size each and will provide open spaces that can be programmed to provide passive or active recreation. Precise placement of these community level parks will be identified at the time of zoning and subdivision, but are identified generally in Figure 14 below.

The Municipal Government Act entitles the City of Edmonton to 10% of the total Gross Developable Area upon subdivision. It is anticipated that 334 ha or 7.3 percent of the City's Legal Entitlement will be taken as land with the rest, approximately 121 ha or 2.7 percent, taken as cash-in-lieu. The proposed 334 ha MR land would provide six local parks at approximately 4 ha each, one regional park at approximately 217 ha and 93 ha for natural area as identified in Figure 14.

Bylaw 15642
May 2 2011

Figure 14: Open Spaces and Parks (Bylaw 16175 Jan 23, 2013)

The identified parks and natural areas are conceptual in nature and subject to change. The specific location of parks will be determined at the zoning and subdivision stages. The location of natural areas will be confirmed by subsequent evaluation.

- ASP Boundary
- Natural Areas
- Potential Parks
- Park
- Waterbodies
- River Valley Natural Areas
- Top of Bank
- Existing Property Lines
- Transportation Utility Corridor

7.8 Risk Management Strategy

While industry continually strives to reduce the danger associated with their operations, there is typically some level of elevated risk to health and safety involved in industrial development due to the potential for accidents. While this risk will continue to exist, good planning can play a role in lessening the impact of any future industrial accidents on people.

The distance between high concentrations of people and industry plays a critical role in managing risk effectively, and has been researched by many industry organizations and government bodies. As discussed in Section 5.12, the Major Industrial Accidents Council of Canada (MIACC) helped to identify guidelines for safe distances between people and industry. *Development will be further guided by studies in air dispersion modeling and risk analysis related to petrochemical facilities.*

(Bylaw 16767 Sept 23, 2014)

General locations for fire stations have also been identified in Edmonton Energy and Technology Park in consultation with the Emergency Response Department. These facilities have been located to provide efficient emergency services to this area, which also works to reduce the risk and severity of any accidents that may occur in the plan area.

Policy

1. A risk assessment is required for industrial uses intended to produce, process, handle, and/or store hazardous materials.
2. Residential uses are not permitted in the ASP area.
3. All site and building designs within the chemical cluster or 1.5km of its boundary shall be designed for ease of evacuation and provide protection to building occupants specific to the potential for industrial accidents.
4. Cumulative effects of multiple risk management sites must be considered as a part of all risk assessments undertaken in the plan area.
5. *Buffer areas will be designated through zoning that restrict uses to those that pose a risk of death of no greater than 1:1,000,000.*

(Bylaw 16767 Sept 23, 2014)

7.9 Existing Residential

That a new zone would be prepared for existing residential properties that would allow for the continuation of the existing uses.

8.0 TRANSPORTATION

The Edmonton Energy and Technology Park ASP area is constrained by several regional roads in the area which may limit access to the developable lands, but which also create opportunities for development. It is important to note that the roadway network for the plan area, as shown in Figures 15-17, cannot be developed in isolation from the rest of the City and region because the road network must operate effectively and efficiently for all users in the future. Therefore, some consideration of a road network through the lands south of Manning Drive is included in this discussion to provide some context for regional traffic movement. The road network outside of the plan area is conceptual in nature and subject to change as part of future land use planning processes.

8.1 Regional Road Network

(Bylaw 16767 Sept 23, 2014)

The south boundary of the plan area is Anthony Henday Drive which will be, when completed, a full access controlled freeway ring road encompassing the City of Edmonton. This ring road allows for the movement of goods and services through the region at higher speeds and less delay.

The portion of Anthony Henday Drive west of Manning Drive was completed in 2011 and has access via interchanges at 66 Street and Manning Drive. A future half interchange is planned at 50 Street, with access to and from the west. The portion of AHD east of Manning Drive is currently under construction and is anticipated to be complete between Manning Drive and Yellowhead Trail by 2016. Additional access for the lands south of Manning Drive (within the Horsehills ASP area) is planned to include an interchange at 153 Avenue and a flyover extension of Victoria Trail.

(Bylaw 16767 Sept 23, 2014)

To the north of the plan area is Highway 37 which connects this northeast part of the Capital Region near Fort Saskatchewan to the northwest parts closer to St. Albert. Today, it is a high speed two-lane rural highway with at-grade intersections with other highways, and graveled or paved municipal rural roads.

Highway 37 in the future will continue to be a component of the future regional road network. The alignment shown in this ASP, including approximate intersection locations, represents the best available information at the time of writing. It was developed through discussions with Alberta Transportation and City of Edmonton staff and it was generally acceptable to both groups. *However, future*

(Bylaw 16767 Sept 23, 2014)

discussions may lead to modifications of the alignment.

(Bylaw 16767 Sept 23, 2014)

Additional lengths of a potential regional road network passes through the plan area on a NW to SE alignment between the Edmonton Institution and the Department of National Defense communication array, crossing the North Saskatchewan River near the Capital Region Waste Water Treatment plant. This facility is expected to have a systems interchange with Manning Drive and with Highway 37 at Highway 28A (Figure 15). A systems interchange accommodates traffic flow between two intersecting freeway facilities. Additional access for either freeway within 3 km of the interchange is undesirable under Provincial standards. There will be access opportunities via service interchanges every two km along Highway 37, Manning Drive and the regional roadway connection between Highway 37 and the North Saskatchewan River crossing. These access locations were also discussed with, and agreed upon, with Alberta Transportation and City staff and represent the best information available at the time of writing this document.

Manning Drive is an expressway facility on a SW to NE alignment, ultimately becoming Highway 15 and turning eastward to Fort Saskatchewan. It connects Anthony Henday Drive to the Regional Road network and will have systems interchanges with both freeways. There is likely space between these two systems interchanges for one service interchange to provide access to the plan area from Manning Drive. A second service interchange location exists to the northeast in the vicinity of the existing Highway 37 intersection point. Manning Drive was transitioned to the Province in a 2012 Highway Transfer Agreement and is currently a Provincial roadway with the completion of the northwest portion of Anthony Henday Drive in 2011.

8.2 Arterial Road Network

The lands in the plan area are well serviced with arterial roads. There are generally three north south arterials spaced at 1.5 to 2 km apart. 66 Street and 50 Street connect Anthony Henday Drive to Highway 37. 18 Street is the third arterial road. It passes Anthony Henday Drive and winds through the lands south of Manning Drive, crosses Manning Drive and connects to Highway 37.

(Bylaw 16767 Sept 23, 2014)

There are also three east west arterials spaced 2 to 3 km apart. 195 Avenue parallels Anthony

Henday Drive to the west portion of the plan area and it is proposed to extend into the plan area intersecting 66th Street and 50th Street and then across Manning Drive to feed into the area south of Manning Drive. The central east west arterial extends from 66 Street to connect to the central service interchange on Manning Drive and then eastward into the lands south of Manning Drive. *The northern arterial parallels Highway 37 from west of the plan area, connects to 66 Street, 50 Street, 18 Street, crosses the proposed regional ring road to connect to the north service interchange and then into the lands south of Manning Drive.*

(Bylaw 16767 Sept 23, 2014)

There are other arterials within the plan area that are included to provide connectivity between the main roadways already discussed. South of Manning Drive, arterial road connections will be necessary and could include:

- East leg of 153 Avenue at Anthony Henday Drive. This could connect through the lands to the south of Manning Drive to connect to the north service interchange at Manning Drive.
- Continuation of Victoria Trail/18 Street from Anthony Henday Drive through the lands south of Manning Drive to cross Manning Drive and extend into the plan area.
- Continuation of east-west roads within the plan area to allow connectivity to the industrial lands via a 195 Avenue extension and as part of the central east west arterial, which connects to the central service interchange.

Lands within the ASP will be subject to Arterial Roadway Assessments (ARA) pursuant to the Arterial Roads for Development Bylaw 14380, or to the policies and bylaws regarding arterial roadways in place at the time of development to cost share the construction of arterial roadway facilities necessary to serve the area. In general terms, the ARA outlines the developer's contribution for arterial roadways construction within the catchment area and is based on the estimated and actual costs for the construction of the arterial roads required for access to a catchment area.

Policy

1. Additional access points to and from Anthony Henday Drive or Manning Drive will not be permitted.

2. Interim accesses for staging purposes must be provided in the location of ultimate interchanges or intersections.

8.3 Collector Road Network

The collector road network shown in Figure 15 was developed using the following guiding principles:

- Minimize creek crossings and other environmental impacts.
- Connect to arterial roadways a minimum 300 m from arterial-arterial intersections and then spaced at a minimum of 200 m along the arterial roadway.
- Provide a reasonable amount of transit coverage through the area to be served from the collector roads, ensuring a maximum 400 m walking distance where possible.
- Locate roadways adjacent to or on quarter section lines where possible, but with the flexibility to relocate as the lands develop to ensure the roadway maximizes, as far as possible, access to development facilities.
- Routed to allow for signed bicycle route connectivity.

8.4 Eco-Industrial Alternative Road Cross-sections

Eco-industrial development includes concepts or methods for reducing the impact that industrial development has on the environment. "Eco" can refer to ecological, but it can also refer to economical. Several methods of creating eco-industrial transportation facilities include:

- Promoting the use of alternate modes of transportation; walking, cycling, or transit.
- Promoting the use of transportation demand techniques including car-pooling, other forms of ride-sharing, and premium parking spaces for those that car-pool.
- Reducing the width of hard surface dedicated to the vehicle which reduces the volume of storm runoff. Pavement width can be reduced by over 30% through the elimination of on-street parking and thereby improve the economics of development.

- Creating roadway ditches to collect and convey storm runoff from local and collector roads. This can also improve development economics while increasing ecological sustainability.

Several alternative road cross-sections were considered through this ASP process for local and collector roadways. These cross sections may include ditches, reduced pavement width, pedestrian accommodation, and transit stop provisions. Modified urban cross-section roadways may be permitted within the plan area, subject to the review and approval of the City of Edmonton Transportation Department. It is important to use the guiding principles above in the creation of alternative cross-sections in the future to serve the eco-industrial area.

Figure 15: Road Network (Bylaw 16175 Jan 23, 2013)

The identified roadways are conceptual in nature and subject to change. The specific alignment of roadways will be determined in subsequent evaluations.

- ASP Boundary
- Potential Parks
- Intersection
- Service Interchange
- System Interchange
- Arterial
- Expressway
- Freeway
- Collectors
- Park
- Waterbodies
- Existing Property Lines
- Transportation Utility Corridor

8.5 Pedestrian/Bicycle Network

The pedestrians and cyclists are accommodated through a comprehensively developed network of multi-use trails, sidewalks, and on-street signed bike routes (Figure 16). The multi-use trails form part of the standard arterial roadway cross-section and therefore the arterial road network is generally the same as the recommended multi-use trail network. The trails connect from known connection points south of AHD on 50th Street and on 18 Street and along the future LRT alignment to feed into the area. The primary goal is to continue these trails into the plan area along these north/south arterial roads to connect to destinations within the plan area and potentially into Sturgeon County.

Typical destinations and routings include:

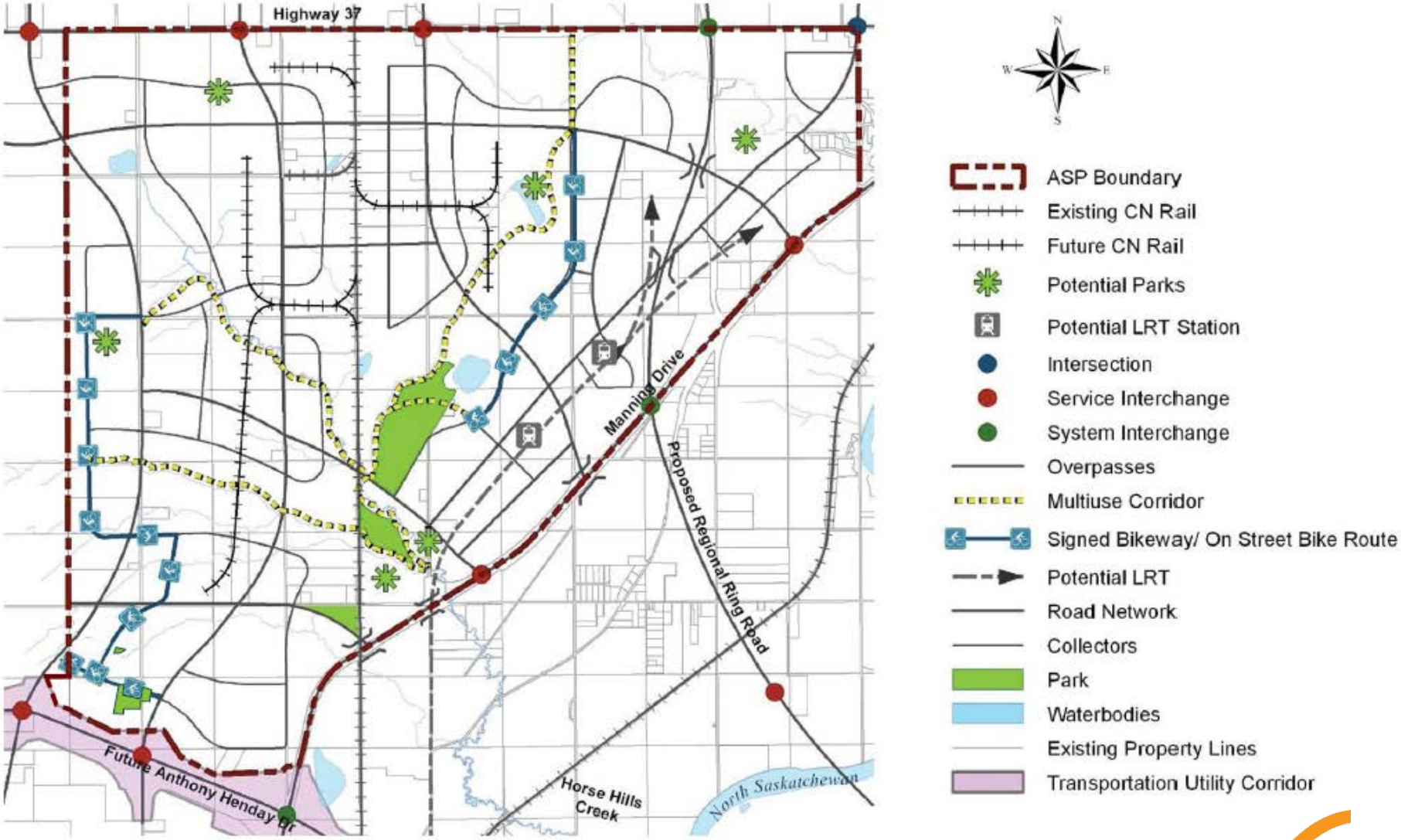
- Regional park facilities.
- LRT and Transit facilities.
- Linear park systems such as along top of bank of the creeks in the area.
- Connections through the lands south of Manning Drive to connect to the river valley park system.

The standard arterial roadway cross-section includes a multi-use trail on one side which allows for many choices for users. Top of bank options have been provided as alternatives for users wishing to stay away from the roadways. A circle route linking regional parks within the plan area to the river valley may also be provided with any future development south of Manning Drive. A commuting bicycle facility may be included adjacent to the LRT alignment for future development and use. On-street signed bike routes are also shown to provide local connections to the multi-use trail system.

Another key component is to ensure that people have well-maintained pathways or sidewalks to walk on throughout the year on all roadways. A key factor to promoting walking or other non-motorized travel is the establishment of convenient and safe routes to multi-use trails. Without those routes, people are less likely to use the multi-use trails or transit to reach their destination. Therefore, all

collector roads should have a sidewalk on one side at minimum with bus stop connector walks as required.

Figure 16: Pedestrian and Bicycle Network (Bylaw 16175 Jan 23, 2013)



8.6 LRT and Transit Network

The potential LRT alignment for the plan area originates from the area of Anthony Henday Drive near Victoria Trail and it runs northward across Manning Drive and then it turns northeastward to parallel Manning Drive to the northeast City limit. Stations could be strategically located within the research and development park, given that it will be the area of highest employment density. Stations could be located at nodes selected to serve both walk-in riders and employees transferring from buses circulating on the larger collector and arterial road network. A large number of people are expected to work in the plan area at full development.

Providing transit service to these employees will help manage the vehicle demands of the area.

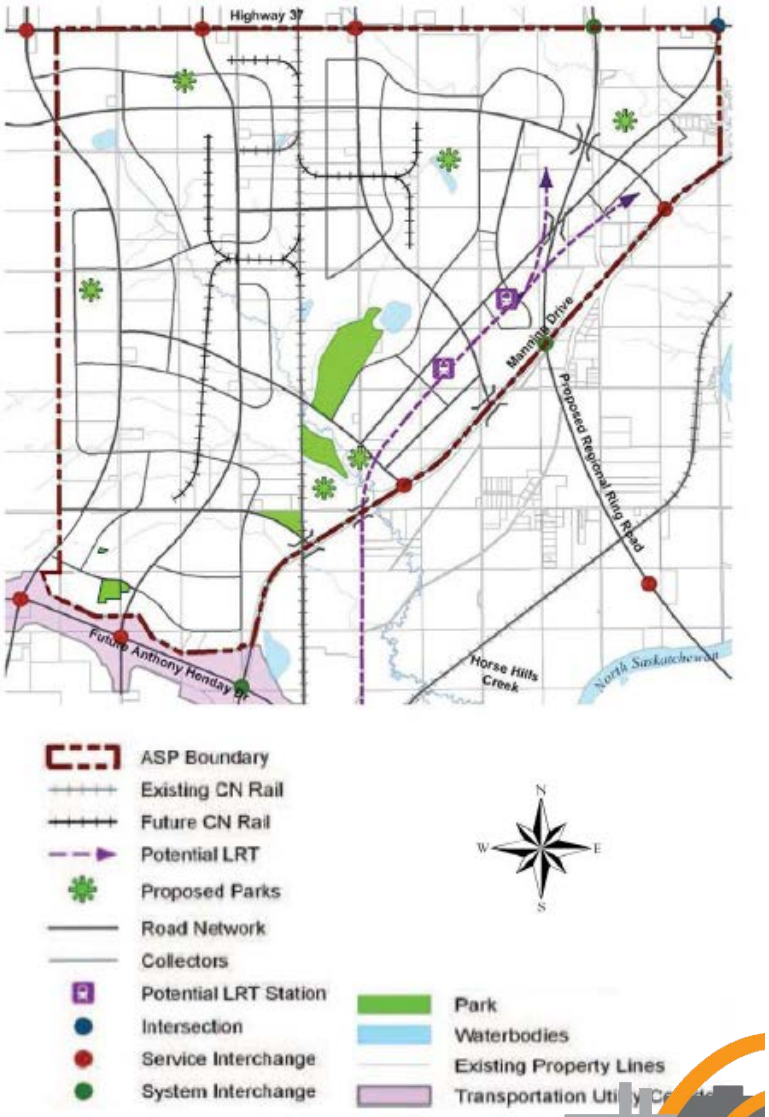
The need or desirability to have LRT routed through the plan area as shown is highly dependent upon the land use and land use intensity for the lands south of Manning Drive. In the event that land now south of Manning were to remain unchanged from the existing agricultural uses, LRT service through the industrial area becomes a key driver in evaluating future LRT extension options in the northeast. However, if the lands south of Manning Drive are planned for additional development in future, it would also influence the LRT alignment choice.

If both the plan area and the lands south of Manning Drive develop, then LRT alignments parallel to Manning Drive on an optimum alignment should be evaluated. Whether the LRT alignment is north, south, or on both sides of Manning Drive ultimately depends on which area will provide the highest level of ridership or add efficiencies to the system. The planning for the Northeast LRT alignment is being prepared separately from the Edmonton Energy and Technology Park ASP and will be considered at a later date. The LRT alignment shown in Figure 17 is a potential alignment only, and will be updated to reflect the completed planning for the Northeast LRT when a final route is determined.

The bus network to serve the area ultimately depends on where transit ridership is concentrated in the plan area. However, the bus network will utilize the collector roads to provide service within the plan area and then travel to the LRT stations using the arterial road network. Therefore, where the LRT station is located has little impact on the transit coverage for the plan area, but it has a greater impact on the frequency of service.

One of the principles considered when establishing the collector road network, and hence, the transit network was the walking distance to the collector road network from the more remote lands. People will typically walk 400 m to a transit stop. Therefore, if the majority of the lands are within this comfortable walking distance to a collector roadway then the area is assumed to have good transit coverage. The network was established with a goal of greater than 85% coverage and this should be the general goal if changes to the network are desired in the future.

Figure 17: LRT and Rail Network (Bylaw 16175 Jan 23, 2013)



8.7 Heavy Rail

Maximizing railway service is important to the marketability of businesses with shipping needs throughout the plan area. Collector and local roadways must be developed in conjunction with the development of spurs from the existing CN Coronado Subdivision to ensure that the potential for rail access is maximized for as many future businesses as possible.

Policy

1. The potential for rail spurs must be considered as a part of the development of the area and the network of local roadways.

2. Lotting patterns and/or roadway designs that restrict the extension of rail service should be avoided, except where it can be demonstrated that subsequent subdivisions would not benefit from rail service.

3. An area level rail service plan should be developed in order to guide the development of rail for each subdivision application.

A heavy rail spur network to service the logistics and petro-chemical cluster uses within the plan area is shown in Figure 17. This is a sample of how rail service could be expanded in the plan area should a market exist for this type of land.

8.8 Pipeline Systems

The plan identifies some suggested alignments for a future pipeline corridor to/from AIH. A similar line is also identified in the Radke report to be contained in the Manning Drive right-of-way. *It will be critical to provide an easy and* *(Bylaw 16767 Sept 23, 2014)*

efficient way for feedstocks to make their way to Edmonton Energy and Technology Park. A pipeline corridor would provide an alternative means of moving product into the plan area. The specific alignment of any future pipelines will require coordination with the Province, Alberta's Industrial Heartland Association, affected municipalities, and the companies that will be using them in future.

9.0 INFRASTRUCTURE AND SERVICING

9.1 Water Servicing

The Edmonton Energy and Technology Park area is not currently serviced with water from EPCOR. A 900 mm diameter supply line owned by the Capital Region Northeast Water Service Commission (CRNWSC) bounds part of the industrial area, generally paralleling Manning Drive. This supply line is fed from a 600mm diameter EPCOR primary pressure zone transmission main which extends north from Clareview Reservoir.

Other water infrastructure in the vicinity includes an EPCOR-owned 300mm distribution main which connects to the supply line at 167 Avenue. This feeds Evergreen Manufactured Home Community, local acreages and greenhouses. There is also a 200 mm distribution main from the primary pressure zone servicing Alberta Hospital and local acreages near 18 Street, north of 167 Avenue. This infrastructure is located to the south of Manning Drive and is not included as part of the overall water servicing infrastructure for the Edmonton Energy and Technology Park. However, depending on development progress there may be opportunity to utilize this infrastructure on an interim basis.

The proximity of the CRNWSC supply line to the study area has the potential to allow for cost effective servicing of the Edmonton Energy and Technology Park provided an agreement can be reached between EPCOR and CRNWSC to utilize this infrastructure. Otherwise a new transmission line would need to be constructed from the terminus of the 600mm EPCOR main to industrial area. In either case, the existing EPCOR 600mm main will need to be twinned to deliver sufficient flows to the area.

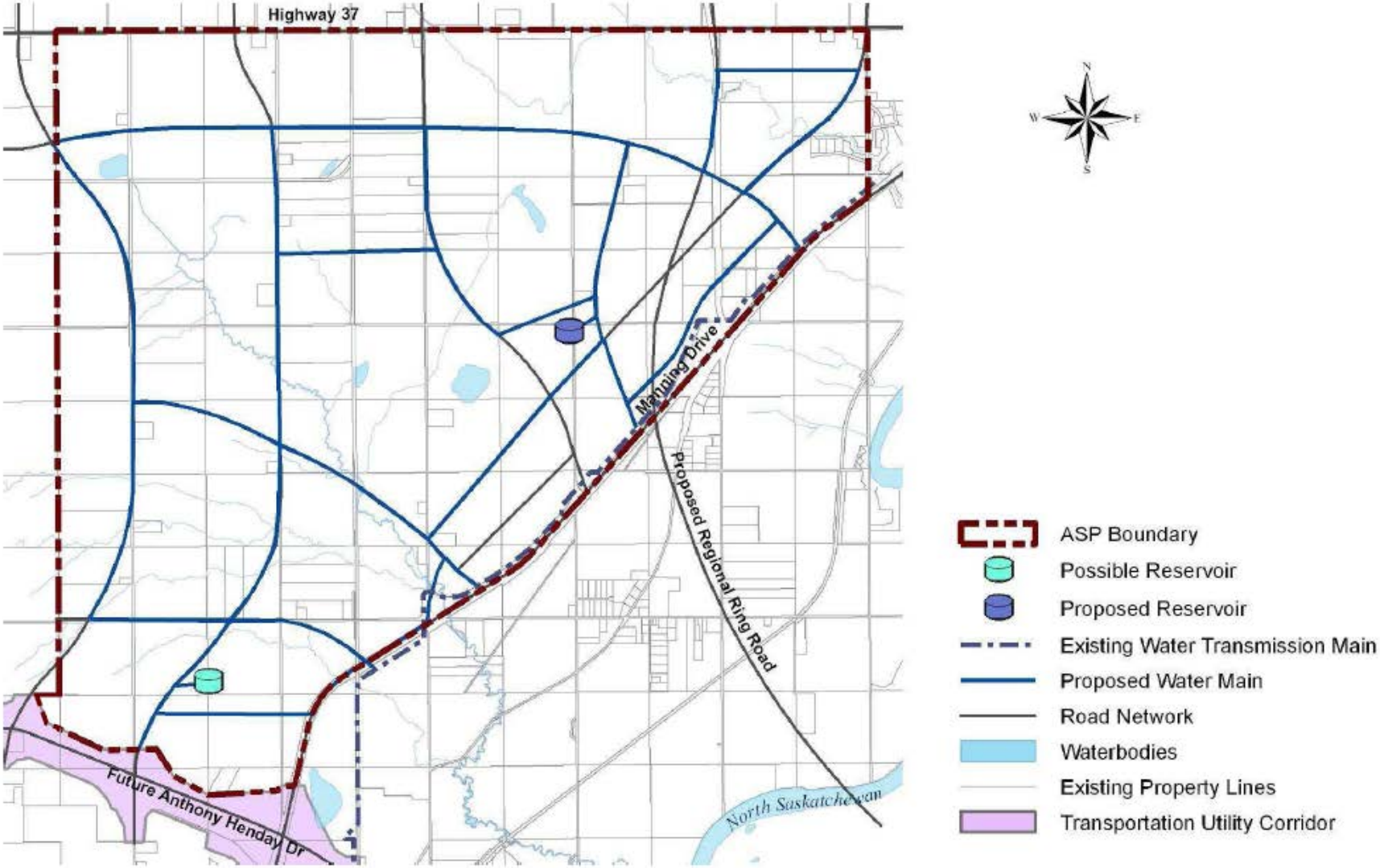
EPCOR's Clareview reservoir would be the main supply point for the area. Clareview reservoir is located within the primary pressure zone, and is filled from Rossdale Water Treatment Plant via EPCOR's transmission network. EPCOR has indicated that the Clareview reservoir may become dedicated to supplying Northeast Edmonton, north of the TUC, and the CRNWSC when development proceeds. EPCOR has also indicated that a series of local upgrades between the Rossdale WTP and the Clareview Reservoir would be completed to provide the required conveyance capacity to the reservoir.

At least one local reservoir will be required in the Edmonton Energy and Technology Park. A potential location for this is indicated on (Figure 18). A second reservoir, depending on future water demands, may also

be required and a possible location for this is also shown. Both reservoir sites are located at higher elevations in the area and would be supplied from the local water distribution system as shown. It should be noted that the suggested local water servicing infrastructure is subject to change, depending on development progress and the required water demands.

Initial development may be fed directly from Clareview reservoir via the existing CRNWSC supply line. However, if agreement with the CRWSC to utilize this infrastructure cannot be reached, the dedicated transmission line, as previously described, will be required to service the area.

Figure 18: Water Servicing Network (Bylaw 16175 Jan 23, 2013)



9.2 Stormwater Servicing

The plan area is located approximately 5 km from the North Saskatchewan River and drains to the river via Horsehills Creek and two unnamed watercourses, #1 in the far Northeast position and the #2 approximately 2.4 km south and fully contained East of Manning Drive (Figure 19). The land generally slopes from west to east, with the plan area being relatively flat with increasing slopes toward the river.

The breakdown of the three basin area is shown below:

Basin	Upstream of Plan Area (km2)	Within Plan Area (km2)	Downstream of Plan Area (km2)	Total Basin Area (km2)
Horsehills Creek	22	40	13	75
Unnamed Watercourse 1	41	8	5	54
Unnamed Watercourse 2	0	5	16	21

All three watercourses become deeply incised with heavily treed ravines between Manning Drive and the river.

Within the plan area, Horsehills Creek consists of six tributaries which merge into a single creek south of Manning Drive. These tributaries are generally very shallow with farming activities to within 5 to 10 m of the tributary. They generally convey stormwater only during spring runoff and during major rainfall events. The majority of the Horsehills Creek and the two unnamed watercourses, are within the City of Edmonton's North Saskatchewan River Valley Area Redevelopment Plan.

The stormwater servicing concept for the plan area supports the eco-industrial concept using the following policies.

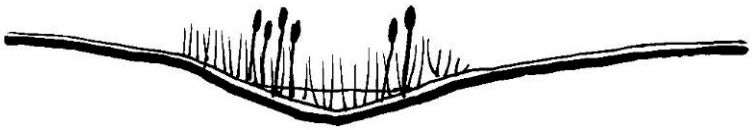
Policy

1. Mimic pre-development hydrologic conditions as much as possible in terms of ground infiltration and stormwater discharges.
2. Sustain the existing creek system ecology for conveying post-development flows in terms of maintaining creek base flows and protecting the creeks from erosion, as well as reducing sediment loading to the river.
3. Retain stormwater on-site as much as possible for irrigation, process water etc. to minimize the reliance on potable water.

The stormwater servicing concept includes on-site best management practices, stormwater management facilities (SWMF) and off-site conveyance system (pipes or creeks) which eventually discharge to the North Saskatchewan River (Figure 19). Two new storm outfalls to the river are proposed at this time.

The use of a number of on-site best management practices is anticipated. This includes the use of on-site storage facilities such as underground cisterns and storage ponds for irrigation and process water purposes. Facilities that promote groundwater recharge such as permeable pavements, bio-retention areas and grassed swales are also anticipated to maintain the pre-development hydrology and to enhance the quality of stormwater discharges.

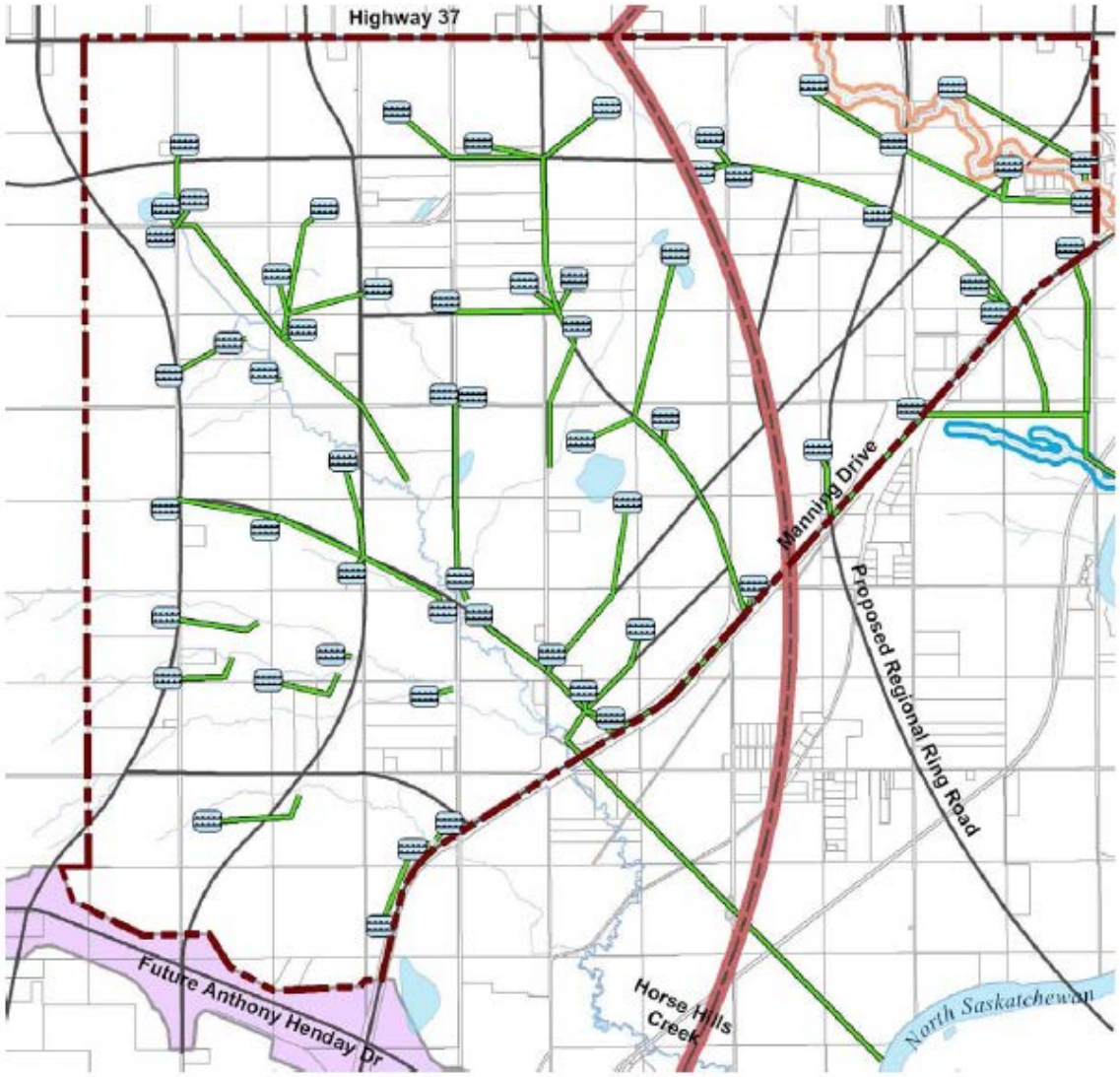
The central and western parts of the plan area are within the Edmonton Garrison Heliport Zoning Regulations Bird Hazard Area. The Department of National Defense (DND) will have authority over the size and number of SWMF as well as the design parameters. Although there is support for habitat development, DND wants to minimize the attractiveness of the area to birds in order to minimize conflicts with heliport operations. The heliport zoning regulations may preclude the use of constructed wetlands. SWMF is to be designed meeting DND requirements and the City of Edmonton Design Standards.



Stormwater discharge from SWMF will be required to be controlled to less than the pre-development rates. This less than pre-development discharge rate is necessary in order to minimize erosion impacts in the creeks, reduce sediment loading to the river, enhance the quality of the stormwater discharge and reduce the size of the downstream conveyance systems.

The stormwater servicing concept will allow interim drainage to the Horsehills Creek and Creek # 1 and # 2, with the outfall trunks to the river to be constructed at a later time. The design of the conveyance systems will have to incorporate provision for future diversions to these outfall trunks. Delaying the construction of the outfall trunks and the river outfalls will allow sufficient time for funding and environmental approvals for these facilities.

Figure 19: Stormwater Management Network (Bylaw 16175 Jan 23, 2013)



- ASP Boundary
- Bird Hazard Line
- Proposed Storm Pond
- Unnamed Creek #1
- Unnamed Creek #2
- Proposed Storm Pipe
- Road Network
- Waterbodies
- Existing Property Lines
- Transportation Utility Corridor

The number, size, and identified locations of stormwater management facilities are shown only to illustrate network principles and are strictly conceptual. The specific attributes of stormwater management facilities will be determined in subsequent evaluations.

9.3 Wastewater Servicing

The study area encompasses 5,238 ha of land. It is located approximately 5 km from the Alberta Capital Region Wastewater Commission's (ACRWC) Treatment Plant and 10 km from the City's Gold Bar Wastewater Treatment Plant. There are two ACRWC trunk sewers running through or adjacent to the study area. The ACRWC St. Albert Regional Trunk Sewer (START) generally runs along 195th Avenue NW while the Northeast Regional Trunk Sewer (NERTS) runs along 34th Street NW (Figure 20).

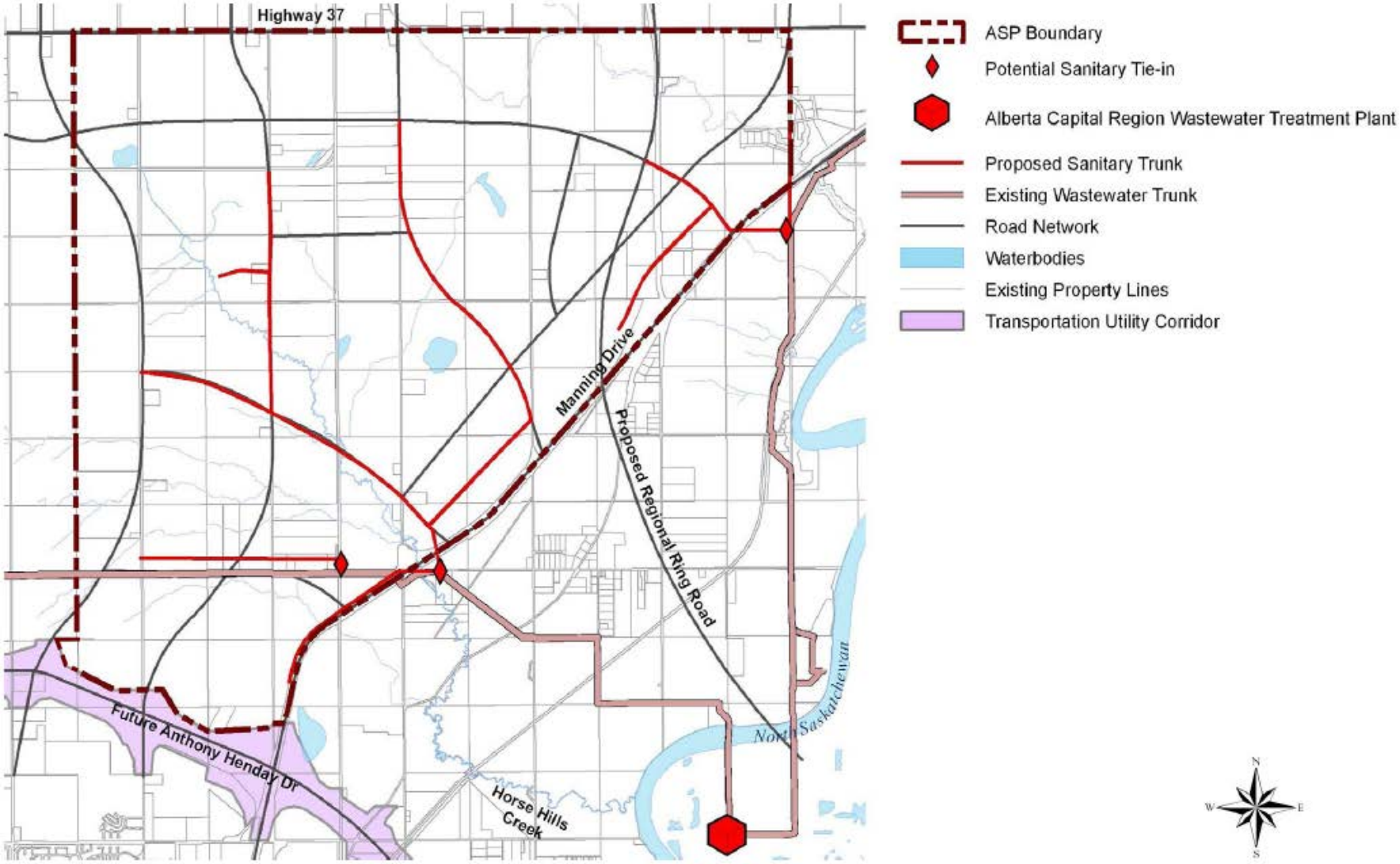
The western, central and southern portions of the industrial area are serviced to the ACRWC START Line, while the northeast portion is serviced to the ACRWC NERTS Line. Three to five connection points are anticipated. The location and number of connections to these regional trunk sewers are conceptual and require formal approval by ACRWC at the development phase.

In 2008, the City of Edmonton and the ACRWC entered into a Regional Wastewater Exchange Agreement, where each party agrees to exchange wastewater transmission and treatment services. Based on discussions with ACRWC, both the START Line and the NERTS Line have surplus capacity to accept wastewater flows from the study area initially, but both regional trunk sewers will eventually need to be twinned to accommodate the increased flows from the study area and the region. ACRWC is obligated under the Regional Wastewater Exchange Agreement to provide the necessary transmission and treatment capacity for these flows. To ensure capacity is available to meet the requirements of the City and the region, the City will provide information to the ACRWC, including development schedules, staging information, and wastewater flow projections through the joint planning process outlined in the agreement.

The Regional Wastewater Exchange Agreement has defined "Level of Service" for exchanging flows at connection points between the City and ACRWC systems. These "Level of Service" parameters have a lower allowable sewage generation rate than that of the City's current design parameters for sizing sanitary sewers in industrial areas. To support the eco-industrial concept, these "Level of Service" parameters have been adopted. This results in smaller sewer pipes, lower overall servicing costs and meet the ACRWC's servicing policies. Water conservation is also encouraged which will result in less sewage generation for treatment and disposal.

The Sanitary Servicing Concept will consider innovative wastewater systems such as local treatment facilities with recycled wastewater used for irrigation or process water. Such services would be required to meet applicable regulations for both the water reuse and the discharge of effluent to the sanitary sewer. Given that this serves as a departure from conventional servicing systems, future policy will be required to address the inclusion of local treatment facilities in developments. This will require consideration of the City of Edmonton's role in physically controlling sewage generation rates from developments, as well as how management of these facilities would be undertaken.

Figure 20: Wastewater Servicing Network (Bylaw 16175 Jan 23, 2013)



9.4 Energy

Electrical service will be supplied throughout the area by private utility agencies. In order to serve the plan area, EPCOR may require a substation to be developed in the plan area, identified in Figure 21. Another substation will also be required to the south of the plan area as development proceeds, which is also shown generally in Figure 21.

The Alberta Energy System Operator (AESO) is currently developing an orientation for new 240 kV / future 500 kV lines that will provide improved service to AIH. One of the options considers routing this transmission line through Edmonton Energy and Technology Park..

Several eco-industrial projects use local power supplies, such as co-generation facilities, waste steam, wind power, solar arrays, or other alternative power generation methods. These local plants are encouraged to develop within Edmonton Energy and Technology Park. Areas that are supplied with a local power supply will not be required to tie into regional services.

In addition, it is anticipated that individual businesses will implement on-site alternative power generation technologies along with energy conservation measures. This will be an important way for industries in the area to reduce their carbon footprint.

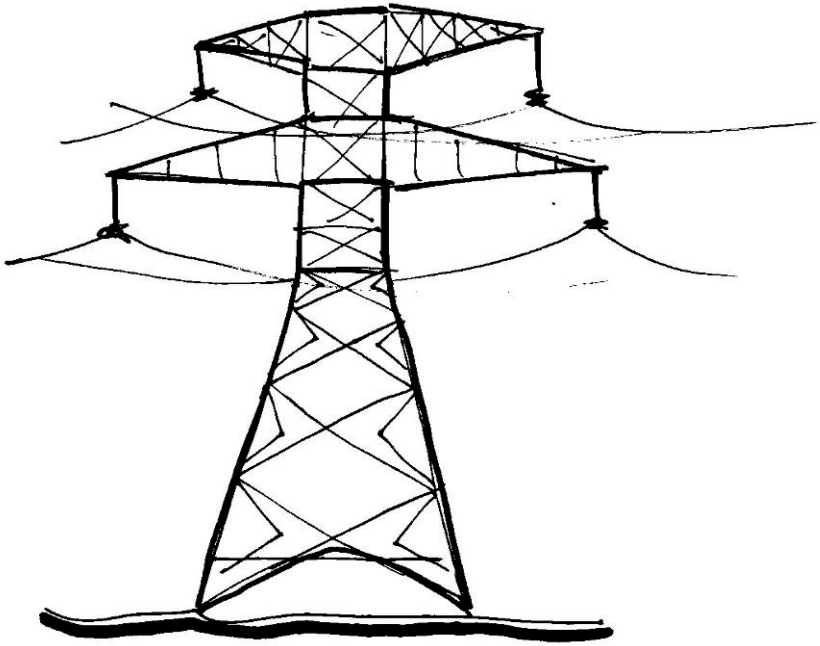
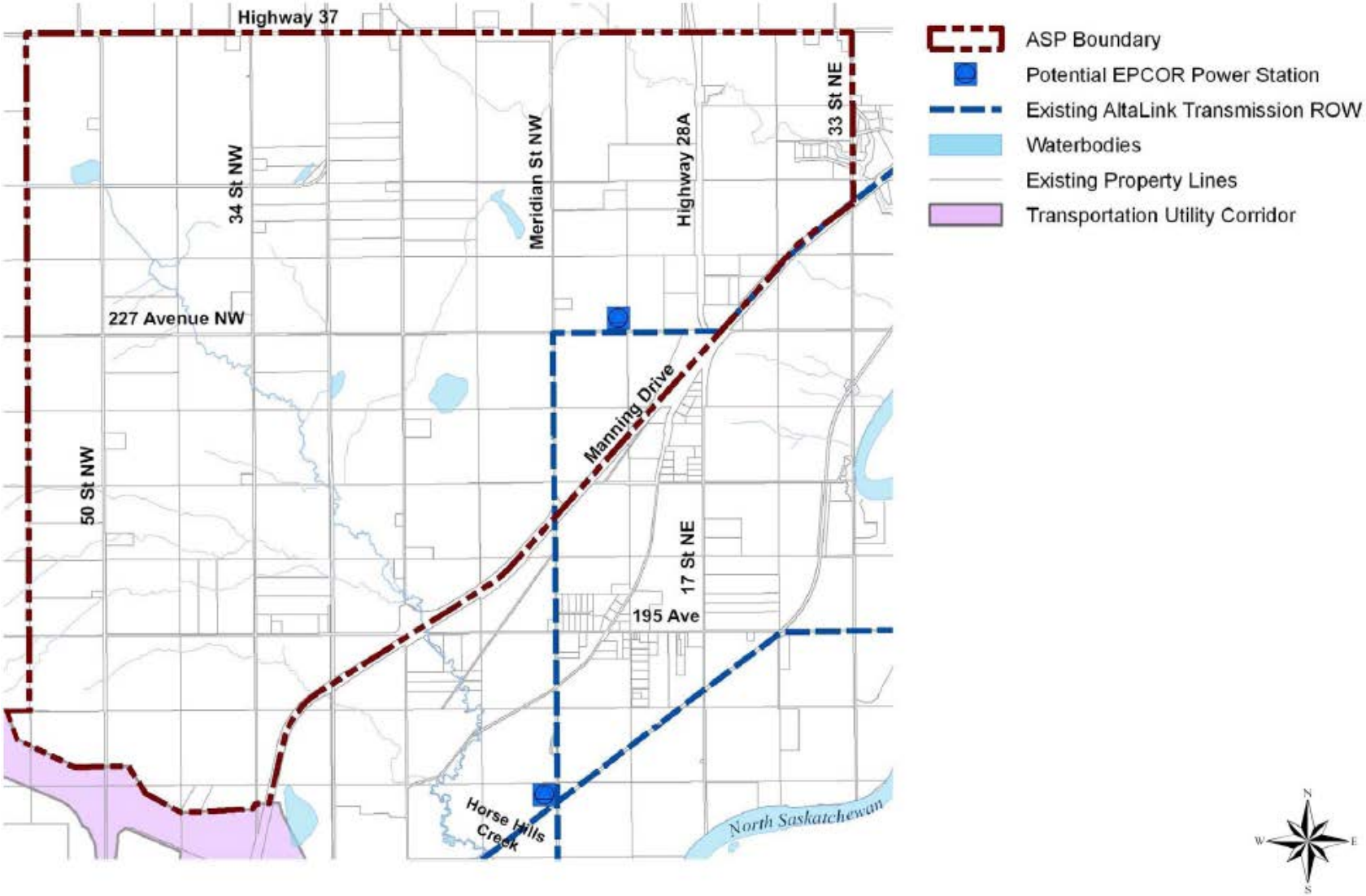


Figure 21: Potential Power Substations (Bylaw 16175 Jan 23, 2013)



9.5 Shallow Utilities

Private utilities, such as power, gas, and other optional services will be supplied by private utility companies as required. Alternative and/or locally based services are also encouraged for shallow utility service provision. Alignments for these services will be determined at the development permitting stage.

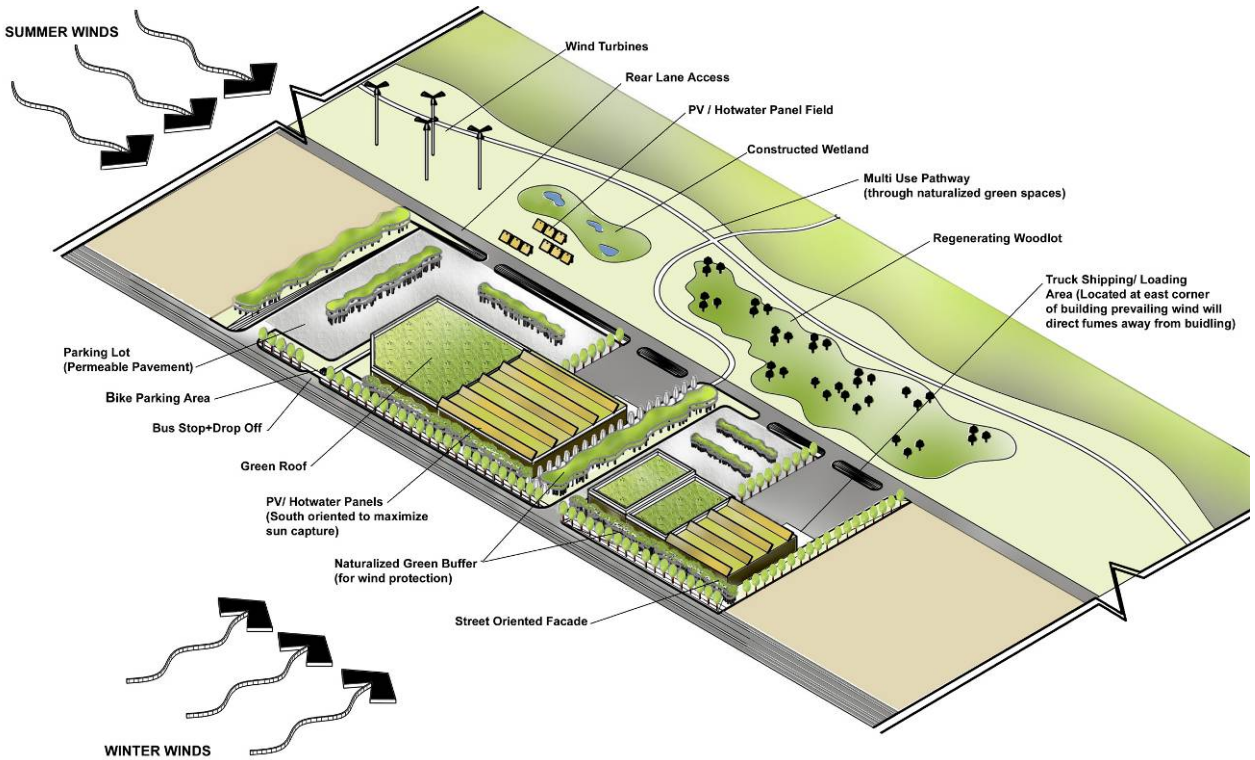
9.6 Communal Piping System

The basis of eco-industrial development includes the sharing of inputs and wastes for the benefit of company bottom lines and the environment. Therefore, waste stream sharing is strongly encouraged by the Edmonton Energy and Technology Park ASP. Waste sharing may include the development of piping systems to allow the transfer of materials such as steam, hydrogen, or process water. This 'green infrastructure' may be included along the boundaries of development sites within a designated easement. These facilities may also be incorporated within road right-of-way at the discretion of the City of Edmonton, where space is available and the substance to be transferred is non-hazardous in nature. Provisions for these minor pipeline systems will be considered at the development permitting stage.

10.0 DESIGN GUIDELINES

Developments in Edmonton Energy and Technology Park should implement the principles of the Edmonton Energy and Technology Park ASP. Attention to details of the design and operation of buildings, structures, infrastructure and associated site improvements will play an important role in achieving the principles Edmonton Energy and Technology Park is intended to exemplify.

standards and development approvals should therefore have regard for the principles of the Edmonton Energy and Technology Park ASP in Section 7. The following design guidelines identify the individual factors at a development level that address the implementation of those principles. An example of how this attention to design could look is shown below:



Zoning

10.1 Sustainable Development

10.1.1 Area Design

1. Create lots with as minimal street frontage as is required for the use, to allow for the most efficient delivery of the valuable linear infrastructure (utilities) in the street.

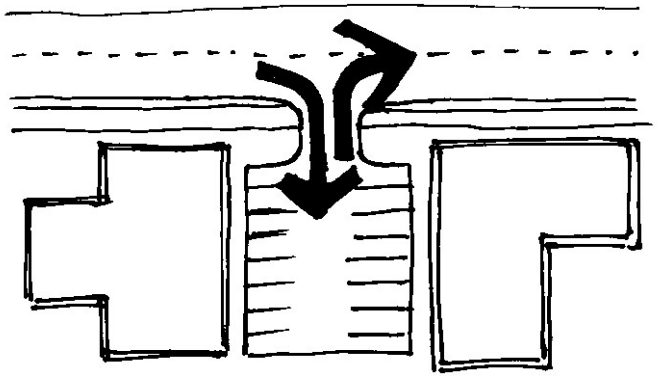
2. Provide for flexibility in lot sizes, densities and heights to accommodate a wide range of potential uses, recognizing that the lot sizes may vary within the ASP land use designations.

3. Establish zoning standards for required parking rates that recognize the area's travel demand management objectives, to avoid requiring more parking than is actually needed.

10.1.2 Site Design

1. Encourage users on adjacent lots to develop interconnected parking lots and service areas under shared use agreements, with the objective of reducing the total amount of land utilized for parking.

2. Incorporate landscape features within parking lots and service areas and around their perimeter to reduce heat island effects.



3. Consider multi-leveled, structured parking integrated into multi-use buildings, where large parking volumes are unavoidable, to minimize the development footprint.

10.1.3 Building Design

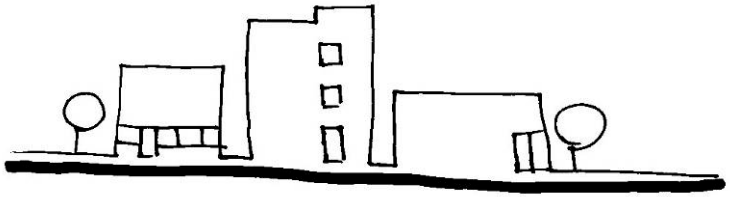
1. Promote the construction of high performance buildings by encouraging each development to pursue LEED* (Leadership in Energy and Environmental Design) certification or other third party green building rating systems, to reduce their net amount of energy consumed and reduce their overall carbon footprint.

2. Encourage a range of building typologies, including

multi-storey buildings, to add variety to the urban environment and to reduce their environmental footprint.

3. Develop street building facades to have inviting, varied and cohesive visual sequence.

4. Require that tall buildings located close to sidewalks have setbacks above the third storey level, to allow sunlight to penetrate to the street level at approximately 45 degrees, to promote naturally lit streets and mitigate wind-tunnel effects.



10.2 Industrial Efficiency and Ecology

10.2.1 Area Design

1. Encourage adjacent developments to coordinate and share material/resource input and output shipping and loading facilities, as well as joint site accesses and service lanes.

2. Encourage businesses to organize themselves to establish Business Collaboration Networks with the objective of sharing information on opportunities to share business intelligence, technologies, infrastructure, services, products, materials and resources.

3. Consolidate logistics areas and major transportation services in hubs that take advantage of road and rail arteries and that will result in the greatest potential for use by area businesses.

10.2.2 Site Design

1. Encourage adjacent developments to coordinate and share material/resource input and output shipping and loading facilities, as well as joint site accesses and

service lanes.

10.2.3 Building Design

1. Locate buildings in close proximity when there are opportunities for sharing of infrastructure such as building systems, energy systems (heating, cooling and electrical), waste systems, parking and loading services, drainage.

10.3 Effective Transportation

10.3.1 Area Design

1. Provide shaded and covered pedestrian routes for protection from natural elements (wind, rain, snow and sun UV radiation).

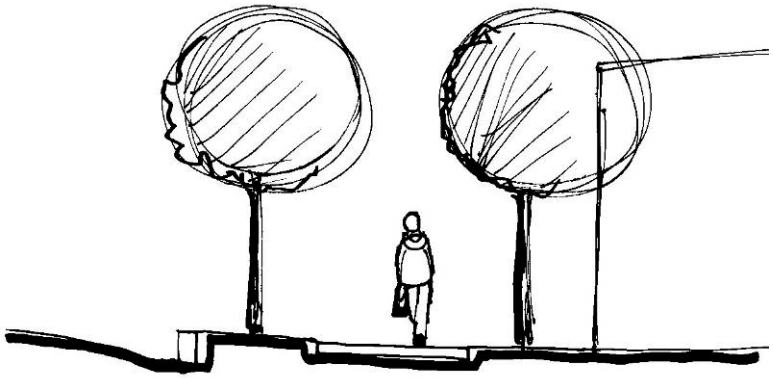
2. Provide sidewalks or recreation paths on at least one side of all streets, and provide sidewalks or recreation paths on both sides of all streets carrying transit, to promote walking and transit use.

3. Provide direct walking routes linking building entrances to street sidewalks, transit stops/stations, pathways, and parking areas, to promote walking and transit use.

4. Provide generous landscaping and amenities adjacent to transit stops, to provide weather protection and to create the stops as recognizable places along the street edge.

5. Use utility corridors, right-of-ways, and easements for possible recreation path connections.

6. Plant canopy trees along all walking routes to define the routes, to provide protection from the elements, and to create a pleasant visual walking environment.



7. Ensure that all pedestrian routes are universally accessible to enable the mobility of persons with a wide range of abilities.

8. Consider requiring dedicated cycling lanes or wide

paved shoulders to provide for safe cycling.

9. Increase land use densities and mixtures of land uses within 800m of potential LRT stations, to maximize the potential for transit use and generate the best returns on the transit investment.

10. Provide ergonomic street furniture, signage and wayfinding along roads and in public areas to promote active transportation modes.

11. Incorporate transit routes in the street layout that provide service for large areas, maximize the number of potential riders and ensure safe and convenient service.

10.3.2 Site Design

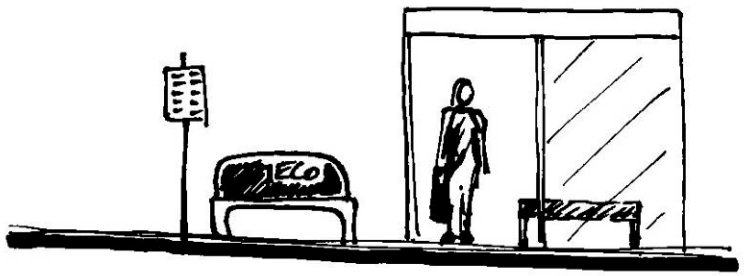
1. Coordinate landscaping within the street right-of-way and on adjacent lands to create a seamless transition between public and private space, to avoid duplication of landscaping investments, and to reduce the road right-of-way requirements where possible.

2. Provide on-site sidewalk or pathway connections between adjacent lots and that link site users to ecological network features and area-wide pathway systems, to improve area walkability.

3. Avoid nooks and confined spaces as well as poorly lit areas adjacent to pedestrian areas, to reduce personal security risks.

4. Require Transportation Demand Management Plans to be completed by applicants as conditions of development approval, with the objective of reducing dependency on private automobile travel.

5. Provide thermal comfort at transit stops, including transit shelters. Also explore recycling the exhaust air from adjacent buildings as a heat source at transit stops.



10.3.3 Building Design

1. Where appropriate, locate buildings close to the street lot line with minimal setbacks to reduce walking distances between buildings and sidewalks, transit stops, and other buildings across the street.

2. Provide bicycle parking on hard surfaces near employee and customer entrances and at transit stops and stations, to promote cycling.

3. Encourage buildings to be designed with shower and changing facilities to serve the needs of active transportation users.

10.4 Land Use Compatibility

10.4.1 Area Design

1. Industrial businesses that would introduce risks to public health or safety are required to submit a risk assessment prior to the issuance of zoning approvals to ensure that they do not pose unacceptable risk to the surrounding area.

10.4.2 Site Design

1. Site development must screen unattractive features from major roadways. Examples of unattractive features include development of extensive outdoor storage, blank building facades, and outdoor assembly yards. Screening of unattractive features can be done using a number of methods, including landscaping, fencing, and/or public art.

10.4.3 Building Design

1. Orient building facades toward the street, and locate parking lots to the rear or side of buildings with landscape buffering, to mitigate noise and improve the visual and pedestrian environment along to the street.

10.5 Innovative Infrastructure

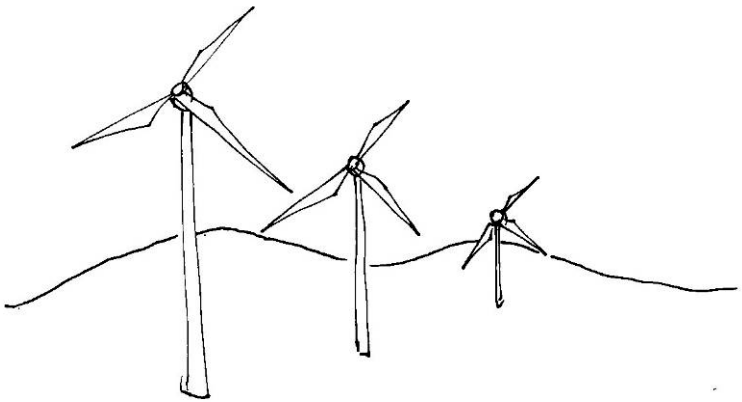
10.5.1 Area Design

1. Use available corridors and right-of-ways for utility, piping and transmission line requirements and protect for future requirements.

2. Encourage businesses to cluster and develop district heating and cooling systems, including manufacturing process heat capture and ground source (geothermal)

heat systems, to increase the proportion of alternative energies used.

3. Encourage businesses and utility providers to collaborate and develop district energy systems that maximize the use of alternative (tri-generation) and renewable energy forms such as solar, wind, and biomass., having regard for the operational requirements of CFB Edmonton.

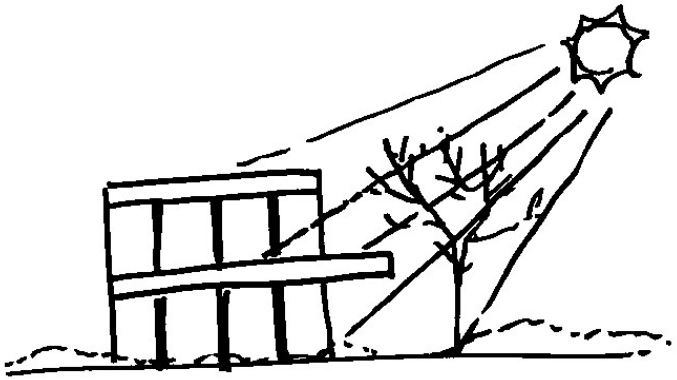


4. Permit and encourage on-site solar arrays, wind turbines, biomass cogeneration, waste incineration cogeneration, fuel cell, and similar energy-producing facilities in all zones. Limit the use of land-consuming energy facilities within 800m of potential LRT stations where greater development densities are desired.

10.5.2 Site Design

1. Encourage the use of residual heat or energy from business operations to provide heating, cooling, and energy for other processes on the same lot, adjacent lots or public spaces, and require the dedication of associated cross-site easements or right-of-ways to enable area-wide systems.

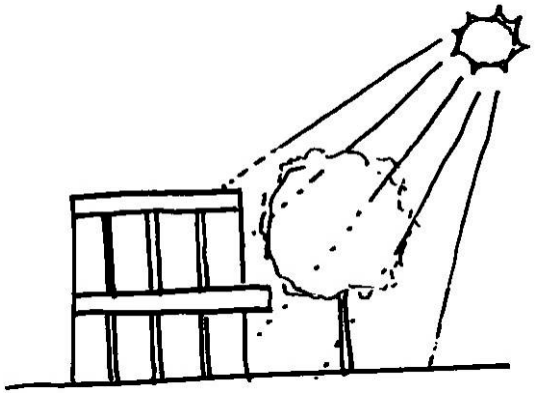
2. Orient streets and buildings to maximize solar exposure for harvesting solar energy.



3. Prescribe a measure of landscaped open space to be included as a zoning standard, to ensure that an

appropriate proportion of a site's area is capable of supporting vegetation and reducing stormwater runoff.

4. Plant trees and shrubs adjacent to buildings and in strategic areas to provide shading, climate protection, and windbreaks, with the objective of reducing energy used for cooling and heating in all seasons.



5. Utilize low water demand plantings to reduce or eliminate the need for site watering and improve survivability.

6. Consider using permeable paving surfaces and light-coloured materials in hard landscaped areas to improve ground water recharge, reduce storm water runoff, and reduce heat radiation.

7. Encourage businesses to development plans and strategies to reduce wastes in site development and operation, and promote the reuse or recycling of otherwise wasted materials.

10.5.3 Building Design

1. Encourage the installation of vegetated roofs and site/building systems that either reduce the amount of storm water runoff and/or reuse storm water on-site or within buildings.

2. Ensure that storm water runoff from site and roofs is quality-controlled through the use of best environmental practices in on-site retention, collection, conveyance, and treatment, prior to discharge into receiving watercourses or storm sewers.

3. Encourage innovative building systems such as grey water recycling and storm water storage, to reduce water consumption.

10.6 Environmental Protection

10.6.1 Area Design

1. Create lots that use natural areas as defining elements of the lot, such as using the buffered edges of watercourse corridors, forest patches or wetlands to delineate rear or side lot lines, to reinforce the role and function of the ecological network in shaping the area's built form.

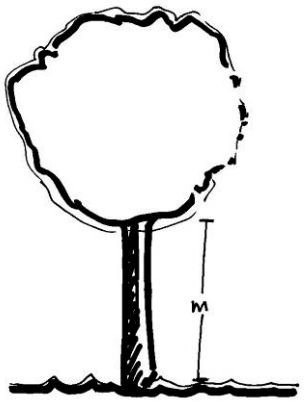
2. Use existing and planned utility corridors as potential areas for naturalization and habitat enhancement, and co-locate trails and pathways to minimize land consumption.

3. Ensure that connections are protected as conditions of development approval to enable the location of recreation paths and trails, and consolidate these with edges of the natural areas as greenways.

10.6.2 Site Design

1. Require green vegetated buffer areas between the edge of protected natural areas and adjacent buildings, parking lots, aisles, and service areas. Use the City's Guidelines for Determining Environmental Reserve Dedication for Wetlands and other Water Bodies as a guide in determining buffer size and shape.

2. Where buffer areas are proposed adjacent to natural features, require the Tree Conservation and Landscape Plans to recommend planting and/or restoration measures that will best transition and integrate the maintained environment with the natural environment.



3. Prohibit site clearing and preparation until Natural Site Assessments, Natural Area Management Plans, Wetland Evaulation, and Tree Conservation and Landscape Plans have been approved in accordance with Section 7.6 of this Plan.

4. Reduce the spread of invasive species by encouraging the planting of indigenous species and using natural alternatives to pesticides and herbicides.

5. Reduce the amount of light pollution onto natural areas and reduce the amount of energy consumed by using

high efficiency and sharp cut-off luminaries.

10.6.3 Building Design

1. Use landscaping and vegetated roofs to minimize environmental impact of excessive noise, light and heat pollution and encourage the maintenance and development of natural habitats to promote biodiversity.

10.7 Effective Implementation

1. City of Edmonton administration are to develop strategies to track and minimize the life-cycle costs and carbon and environmental impacts of the construction processes as well as after construction, for the complete life-cycle of buildings, systems and infrastructure.

11.0 IMPLEMENTATION

It is anticipated that the Edmonton Energy and Technology Park ASP will develop over a period of 30 – 50 years. Within that time period, it is important to provide guidance that will ensure that development occurs in a way that maximizes efficiency while minimizing the disturbance to the surrounding community.

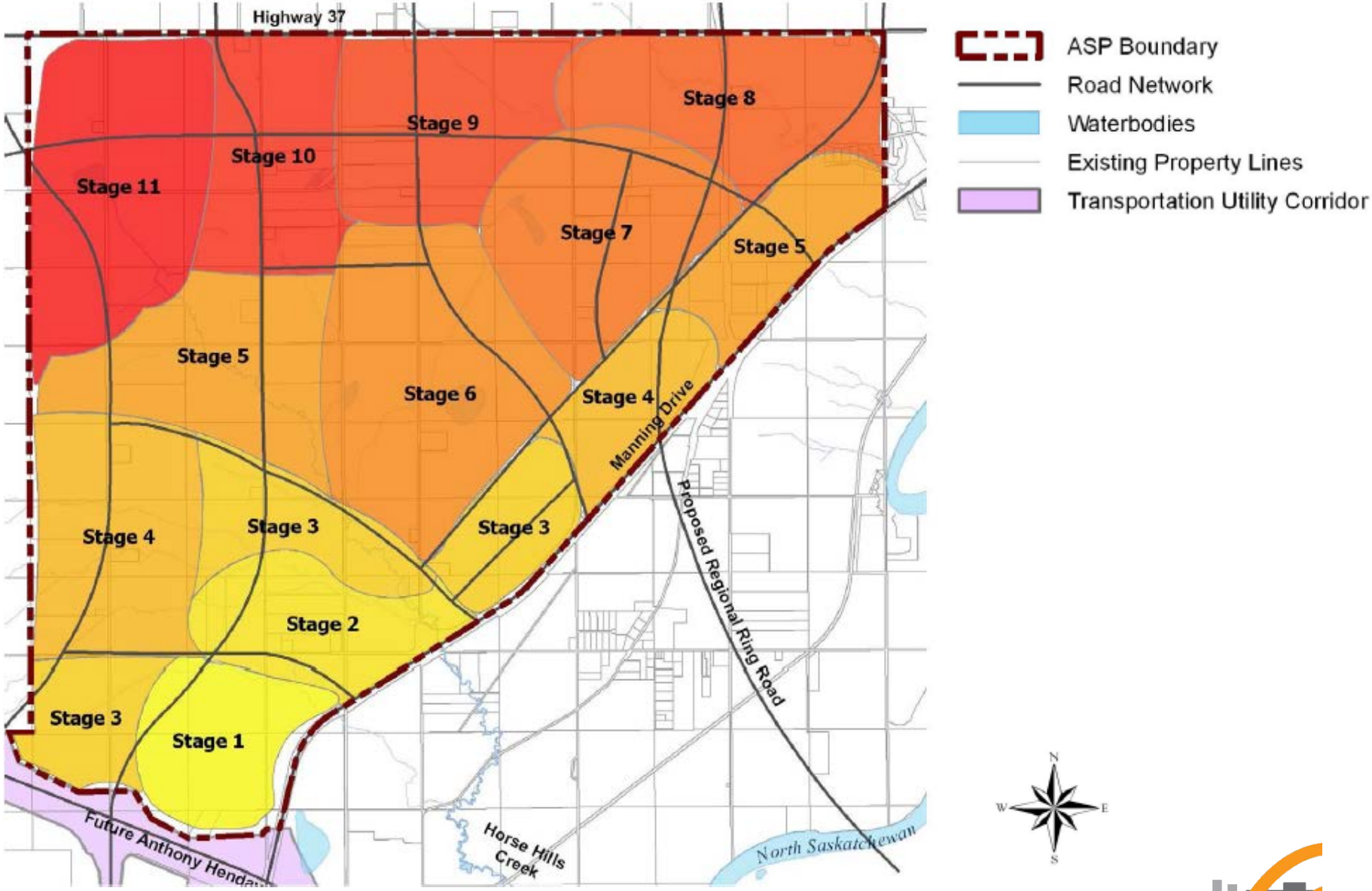
11.1 General Staging

Development staging is intended to provide a recommended direction for the development of the plan area. It is not intended to be regulation, but instead provides a preferred direction for development to take given the location of existing services, market conditions, demographics, and other factors relevant to growth patterns (Figure 22).

Development is recommended to commence in the southern portion of the plan area and extend towards the northeast corner, following Manning Drive. Development will then trend towards the northwest corner from Manning Drive as services are extended from their existing locations.

Given that chemical feedstock availability is critical to the development of the petro-chemical cluster, it is important that a supply of these feedstocks is available for the plan area. It is anticipated, that the development of the petro-chemical cluster area may lag in the initial stages of development. Therefore, the initial stages will be dominated by the development of the manufacturing and business park uses. However, it is anticipated that the petrochemical cluster will catch up to surrounding development after a few stages have been undertaken, which will provide the benefit of some existing support industries in the area. Once the petrochemical cluster has begun development, it is expected to lead development in the other supportive land use precincts.

Figure 22: Development Staging (Bylaw 16175 Jan 23, 2013)



11.2 Technical Report Requirements

The approval of the Edmonton Energy and Technology Park ASP is only the first step in the development of the plan area. It provides the vision and initial development parameters to initiate subsequent steps in the planning process.

The Edmonton Energy and Technology Park ASP encompasses a large land area, which presents unique coordination challenges at the time of implementation. The scale of the ASP is such that details of engineering, natural areas protection, and municipal reserve allocation are identified on an area level. This level of information does not provide sufficient detail to provide decision-makers the information they need to approve an individual project. However, the ASP provides sufficient detail that additional full area or neighbourhood level plans are unnecessary.

Therefore, this area will require a new type of process for the review of zoning applications. Zoning applications in Edmonton Energy and Technology Park will require a coordinating technical report to be in place to address this detail shortfall, which will take the form of a technical report. The Technical Report will be provided by applicants for land use changes in the area. The geographic extent of the Technical Report is identified in Figure 23. Prior to the approval of any zoning change in the identified sub-areas, a Technical Report must be provided to the satisfaction of the City of Edmonton administration.

This Technical Report must include the following components as they pertain to the entire sub-area:

- A Water Network Analysis
- A Neighbourhood Design Report
- Sub-area Municipal Reserve allocation
- Natural Site Assessment(s)
- A Wetland Evaluation
- Ecological Design Report
- Wayfinding Assessment
- Crime Prevention Through Environmental Design (CPTED) Assessment
- Views and Vistas Assessment
- Wildfire Hazard Assessment
- A brief synthesis report identifying how this system works together

At the discretion of the City of Edmonton, the Technical Report may also include:

- A sub-area specific Risk Assessment
- A Transportation Assessment
- A Natural Area Management Plan
- Communal piping alignments
- Railway spur alignments

The above noted studies will be identified in greater detail in the following section. Additional studies or details may be included in the Technical Report, depending on the review requirements of City of Edmonton administration. It should be noted that the Technical Report may not deviate from the intent of the Edmonton Energy and Technology Park ASP.

11.3 Planning Documents / Engineering Studies

In order to support future development, the following additional studies and implementation tools are needed. These may or may not be included in the parameters of the Technical Report described above, depending on the information needs for each sub-area.

- Pipeline Study

A pipeline study should be undertaken to consider the viability of a pipeline corridor between Edmonton Energy and Technology Park and AIH, as well as pipelines to transport chemical products. A pipeline reduces the amount of truck or rail traffic needed to transfer feedstocks or chemical goods to market. A pipeline also reduces the introduction of industrial accidents, which are most likely to occur during transportation.

- Zoning Bylaw Amendments

The conventional industrial zones used within the City of Edmonton do not provide the necessary specificity to support the land uses contemplated for this area. *New zoning tools were necessary in order to implement the vision of the Edmonton Energy and Technology Park ASP. The zoning methods chosen for this area incorporated eco-industrial principles described in the ASP.* *(Bylaw 16767 Sept 23, 2014)*

- Neighbourhood Design Reports

A number of Neighbourhood Design Reports (NDR) will be required in order to provide engineering detail to support site development in the area.

- Ecological Information Requirements

A range of studies will be required to assist the City in protecting and restoring Edmonton Energy and Technology Park's many and varied natural areas. These studies include Natural Site Assessments, Wetlands Evaluations, Natural Area Management Plans, and Tree Conservation and Landscape Plans. The highest value natural areas will be acquired through a combination of Environmental and Municipal Reserve. Natural areas of lesser priority will be retained through the site decision process and integrated into developments. The studies and their timing requirements are identified in Section 7.6.

- Risk Assessment

(Bylaw 16767 Sept 23, 2014)

A Risk Assessment will be required for any proposed industrial development that either stores, creates, or uses hazardous materials as a part of their operations. This study will be required prior to the issuance of zoning approvals and before development permitting may commence. *Furthermore, the Zoning Bylaw will include regulations around designated buffer areas restricting uses to those that pose a risk of death no greater than 1:1,000,000 as determined by an approved Risk Assessment.*

- Shadow Plan

A shadow plan will be required in order to illustrate provide lot layout, roadway configuration, and connectivity between sub-areas along the top of bank.

- Environmental Site Assessment

A Phase 1 Environmental Site Assessment will be required for areas where there is potential for environmental contamination to be present. Additional studies or remediation efforts may be required to ensure that sites are suitable for development. This information will be required at the zoning stage.

- Communal Piping Study

If communal piping for shared utilities or sharing waste streams is to be considered, a specific implementation strategy will need to be considered. This will include determining where these pipes would be located (ie., road right-of-way, onsite easements, etc), how many pipes would be permitted within the designated area, whether formal agreements would be needed between companies or through civic departments, and engineering logistics.

Existing Bylaws, such as the Sewers Bylaw, may also require amendment in order to implement communal piping.

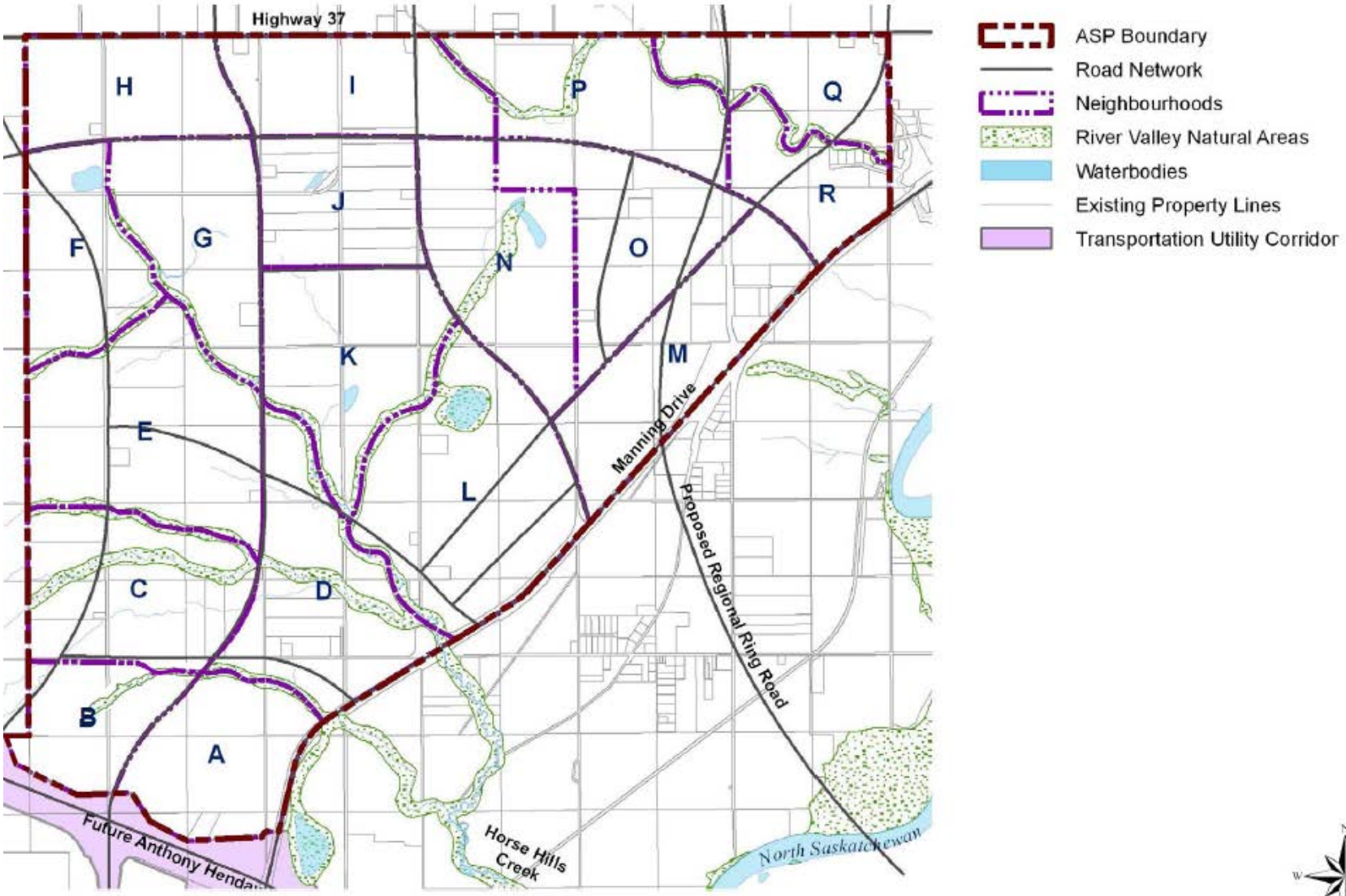
11.4 Public Consultation Requirements

Public consultation for development in this area will be in accordance with the Municipal Government Act (MGA) and the City of Edmonton public consultation policy.

11.5 Monitoring

This plan will be reviewed every ten years to ensure relevancy of its main objectives. If the vision of this document is deemed to be no longer relevant, a new plan must be implemented to supplant its policy direction.

Figure 23: Technical Report Sub-Areas (Bylaw 16175 Jan 23, 2013)



	Area (ha)	%GDA
Gross Area	**5244**	
Environmental Reserve/Ravine	366	
Arterial/Freeway	304	
Gross Developable Area	**4574**	**100%**
Regional Park	217	4.8%
Local Park	24	0.5%
Natural Area (NA)	93	2.0%
Stormwater Management Facilities	214	4.7%
Circulation	697	15.3%
Net Developable Area	**1245**	**27.2%**

Net Land Uses	**Area (ha)**	**%GDA**
R&D, Education &Services	439	9.6%
Petro-Chemical Cluster	1239	27.2%
Logistics	783	17.1%
Manufacturing	868	19.0%
Total	**3329**	**72.8%**

Amended by Bylaw 16175, Jan 23, 2013

R&D, Education & Services	ha	%Area
Gross Area	657	100%
SWMF	26	4%
Park	4	1%
Natural Area (NA)	13	2%
Arterial/Freeway	76	12%
Circulation	99	15%
Net Area	**439**	**67%**

Logistics	ha	%Area
Gross Area	1100	100%
SWMF	44	4%
Park	0	0%
Natural Area (NA)	22	2%
Arterial/Freeway	90	8%
Circulation	165	15%
Net Area	**778**	**71%**

Petro-Chemical Cluster	ha	%Area
Gross Area	1714	100%
SWMF	69	4%
Park	8	0.5%
Natural Area (NA)	34	2%
Arterial/Freeway	78	5%
Circulation	257	15%
Net Area	**1268**	**74%**

Manufacturing	ha	%Area
Gross Area	1173	100%
SWMF	47	4%
Park	12	1%
Natural Area (NA)	23	2%
Arterial/Freeway	60	5%
Circulation	176	15%
Net	**855**	**73%**

Industrial Land Use	Total Area (ha)	% Developable	Developable Area	Employees/ha	Total Employees
Logistic	1338	71	783	15	12,313
Manufacturing	1501	73	868	27	23,436
Petro-Chemical Cluster	1714	74	1268	7	9,400
Business Park/R&D	657	67	439	91	40,140

12.0 REFERENCES

AcuTech Consulting (2002). Process Safety Management in Canada – The Dissolution of MIACC. Retrieved from: http://www.acusafe.com/Newsletter/Stories/1299News-PSM_Canada.htm

AGRA Earth & Environmental et al. (2002) Alberta's Industrial Heartland Complementary Area Structure Plans Background Report.

Alberta's Industrial Heartland Association (2008). Upgrader Summary (Spring).

Alberta's Industrial Heartland Association (2008).Oil Sands 101 Update. Retrieved from: http://www.strathconacounty.com/pdfs/2008/AIH/Oilsands%20101%20March%204%2008%20Updated.pdf

City of Edmonton (1998). Plan Edmonton. (Bylaw 11777).

City of Edmonton (1999). Transportation Master Plan. (Bylaw 13939)

City of Edmonton, Planning and Development Department (2004). Smart Choices for Developing Our Community Recommendations Report.

City of Edmonton, Planning and Development Department (2004). Smart Choices Brochure.

City of Fort Saskatchewan (2000). Municipal Development Plan (Bylaw C12-99)

Doug McCutcheon & Associates (2007). Heavy Industrial Land Use Risk Approval Review.

FdP Associates (2008). Presentation: Downstream Industrial Cluster Opportunities for the North East Quadrant Phase 1: Demand Analysis.

ISL Engineering and Land Services (2008). Capital Region Integrated Growth Management Plan: Final Report on Core Infrastructure.

Kline and Company, Inc. (2008). From Oil Sands to a World'Class Eco-Industrial Chemical Cluster for Greater Edmonton (Final Presentation, Edmonton Seminar).

Major Industrial Accidents Council of Canada (1995). Risk-Based Land Use Planning Guidelines.

Municipal Government Board (1997). Board Order: 77/98 Sturgeon County Disputes with Edmonton, St. Albert, and Morinville.

Province of Alberta, Capital Region Board Website. Retrieved from: http://capitalregionboard.ab.ca).

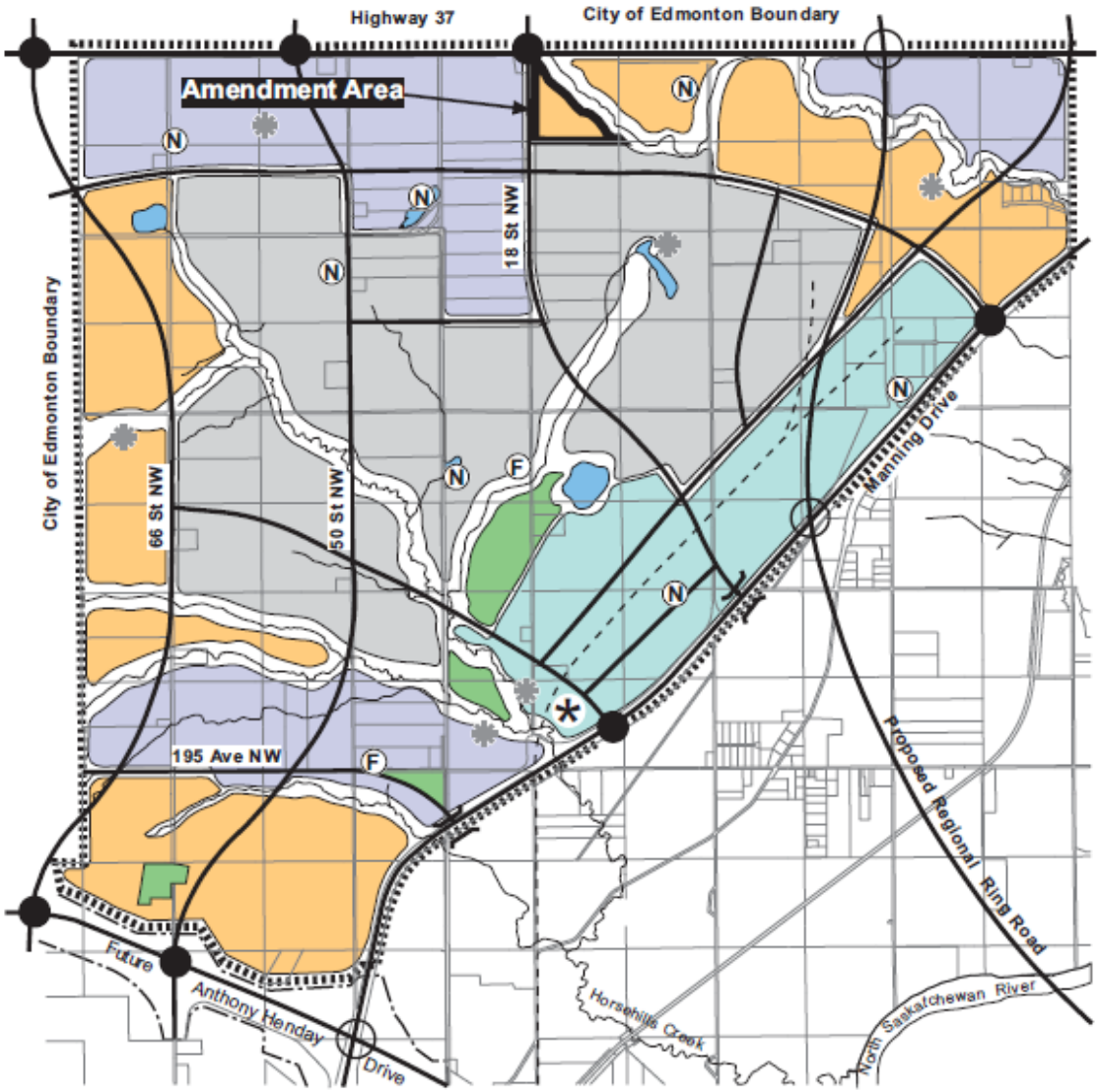
Province of Alberta. (2005 Office Consolidation) Municipal Government Act. Edmonton, AB: Alberta Queen's Printer.

Province of Alberta. Transitional Regional Evaluation Framework (Schedule A to Ministerial Order L:005/08). Edmonton, AB: Alberta Queen's Printer.

Sturgeon County (1996). Municipal Development Plan. (Bylaw 818-96)

Strathcona County (2007) Municipal Development Plan. (Bylaw 1-2007)

(Bylaw 16767 Sept 23, 2014)



BYLAW 16767
AMENDMENT TO
EDMONTON ENERGY & TECHNOLOGY PARK
AREA STRUCTURE PLAN

- R & D, Education & Services
- Petro-Chemical Cluster
- Logistics
- Manufacturing
- Park
- Waterbodies
- ASP Boundary
- Nanaksar Gurdwara Gursikh Temple
- Creeks & Streams
- Transportation Utility Corridor
- Potential LRT
- Road Network
- Existing Property Lines
- System Interchange
- Service Interchange
- Potential Fire Stations
- Potential Natural Areas
- Potential Parks